BTO RESEARCH REPORT 644

BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds.

Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A.

Birds Science People

BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds

Great Spotted Woodpecker, one of 117 species covered by this report, has increased more than fivefold across the UK since 1967

Key findings

Species list

Using the BirdTrends pages

These pages are a one-stop shop for information about the population status of the common breeding birds of the wider UK countryside. The report is based on data gathered by the many thousands of volunteers who contribute to BTO-led surveys. For each of 117 species, users can quickly access the latest information on trends in population size, breeding performance and survival rates, as measured by our long-term monitoring schemes.

The website covers the majority of UK breeding birds but excludes (with a few exceptions) colonial seabirds, which are well covered by the JNCC'sSeabird Monitoring Programme, and the rare species that are included in the reports of theRare Breeding Birds Panel (e.g. Holling & RBBP 2012). For each species, we provide:

- General information concerning species' conservation listings and UK population sizes
- A 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 showing the trends and changes in population size, breeding performance and survival over the longest periods available
- Trends for the BTO/JNCC/RSPB Breeding Bird Survey (BBS) cover not just UK as a whole but also each of its constituent countries (England, Scotland, Wales and Northern Ireland)
- Alerts, drawing attention to population declines in any census scheme of greater than 25%, or greater than 50%, that have occurred over the past five, 10 and 25 years and the maximum period available (usually 43 years).

Text, tables, graphs and presentation are updated annually to include the latest results and interpretative material from the literature. Information on demographic trends and on the causes of change is gradually being expanded. The Key findings page provides a brief overview of our main findings this year.

Supporting pages describe the field and analytical methods that were used to produce the results for each species and to identify alerts. We discuss overall patterns of trends in abundance and breeding success, and compare the latest trend information and alerts with the Birds of Conservation Concern list (Eaton *et al.* 2009). Summary tables list alerts and population changes by scheme, and there is also a facility to select and display your own tables of population change. A detailed References section lists more than 640 of the most relevant recent publications, with onward links to abstracts or to full text where freely available, and is a valuable key to recent scientific work by BTO and other researchers.

We would value your comments on this report and particularly any suggestions on how it can be improved.

EMAIL YOUR COMMENTS

Authors

These web pages constitute an annual report that is part of the BTO research report series. Authors were Stephen Baillie, John Marchant, David Leech, Dario Massimino, Sarah Eglington, Alison Johnston, David Noble, Carl Barimore, Allison Kew, Iain Downie, Kate Risely and Rob Robinson. The formal citation for the report is given in the page footer.

Key findings

This section summarises the key findings of the report, under six headings, based on the results presented and discussed in the Summary tables and Discussion sections. It concentrates on the alerts raised by this edition of the report and changes to alerts since previous reports in this series.

Declining species

Turtle Dove has declined by 93% since 1967 and has the steepest decline measured for any bird during 2000–10

In the current report, there are again 25 species for which our best long-term trends show statistically significant population declines of greater than 50% over periods of 31-43 years.

These are Grey Partridge, Redshank, Woodcock, Snipe, Turtle Dove, Cuckoo, Little Owl, Lesser Spotted Woodpecker, Willow Tit, Marsh Tit, Skylark, Willow Warbler, Whitethroat, Starling, Song Thrush, Mistle Thrush, Spotted Flycatcher, House Sparrow, Tree Sparrow, Yellow Wagtail, Tree Pipit, Linnet, Lesser Redpoll, Yellowhammer and Corn Bunting (taxonomic order). The steepest long-term populations declines we have measured are for Tree Sparrow, Turtle Dove, Grey Partridge and Willow Tit, which have all declined by more than 90% since 1967.

These 25 declines outweigh the 21 species that show an equivalent doubling of population size over similar periods (see Positive changes).

Except for Little Owl, which as an introduced species is not eligible, all these rapidly declining species already benefit from listing as either red or amber Birds of Conservation Concern (PSoB/BoCC3) list, as revised in 2009. Six species among those that have declined the most are listed only as amber and may be candidates for red listing at the next review: Redshank, Woodcock, Snipe, Willow Warbler, Whitethroat and Mistle Thrush.

A further eight species raise lower-level concern, as a result of statistically significant long-term declines of between 25% and 50%. These are Lapwing, Common Sandpiper, Tawny Owl, Dipper, Dunnock, Grey Wagtail, Meadow Pipit and Bullfinch. All of these species are already on the amber list on account of their population declines, except for Lapwing, which is red listed, and Dipper and Tawny Owl, which remain for now on the green list.

In addition, Little Grebe, Curlew and House Martin (all amber-listed) have also declined by more than 25%, but raise no formal long-term alerts because the confidence intervals around their change estimates are too wide.

Three scarcer species, monitored only over much shorter periods, have also decreased by more than half during just a 15-year period: Wood Warbler, Whinchat and Pied Flycatcher. The last two are only amber listed but are declining so steeply that red listing may well be warranted.

Recent changes to alerts

Lapwing has declined by 57% across the UK since 1985

This report raises alerts for population change to conservation bodies when the best available estimates of long-term decline are statistically significant and pass criteria set at -25% and -50%. Species with declines close to these threshold values often change category between years, whereas amber and red listings are reviewed less frequently.

The latest data indicate that just two adjustments are needed to the long-term alerts since the 2011 version of this report. No species enter or leave the alert category as a whole.

Song Thrush formerly raised an alert for its population decline of between 25% and 50%. It now raises a high-level alert, its decline having passed the 50% threshold (-54%).

Lapwing formerly raised a high-level alert for its population decline of >50%. It now enters the lower alert category, its long-term decline having dropped below the 50% threshold (-45%). The 25-year trend for this species, which has a much narrower confidence interval, stands at -57%, and a return to the >50% category may well occur within a few years.

Positive changes

Although Grasshopper Warblers have declined rapidly over the longer term, BBS results indicate a 59% increase since 1995

Although falling short of the 25 species that have at least halved over the long term (see Declining species), there are 21 species that have shown a statistically significant doubling in population size over similar periods (usually 43 years), according to our most representative trends.

These 21 increasing species are Mute Swan, Greylag Goose, Canada Goose, Shelduck, Mallard, Sparrowhawk, Buzzard, Coot, Stock Dove, Woodpigeon, Collared Dove, Green Woodpecker, Great Spotted Woodpecker, Magpie, Jackdaw, Carrion Crow, Great Tit, Long-tailed Tit, Blackcap, Reed Warbler and Nuthatch (taxonomic order).

Four further species monitored only over shorter periods have also more than doubled (while four equivalent species have more than halved: see Declining species). Cetti's Warbler has increased by 128% since 1999 and even faster increases have been recorded, for the period since 1995, for Barn Owl (+390%), Red Kite (+572%) and the non-native Ring-necked Parakeet (+1012%). Ring-necked Parakeet has maintained exponential growth since 1995 and has by far the highest rate of increase of any species in this report.

For five species that are listed red or amber for population decline over the long term – Little Grebe, Song Thrush, House Sparrow, Lesser Redpoll and Yellowhammer – decline has started to level off, or has ceased, during the recent ten-year period.

Six other formerly declining species – Whitethroat, Grasshopper Warbler, Dunnock, Tree Sparrow, Bullfinch and Reed Bunting – have reversed their trend and shown significant population increases over the last ten years. Where the earlier decline had been steep or long-lasting, however, for example for the red-listed Tree Sparrow, population levels remain severely depleted despite recent increase.

Reduced breeding success

Reproductive output has decreased for the red-listed Tree Pipit.

Our best overall measure of breeding success is Fledglings Per Breeding Attempt (FPBA), calculated from brood sizes and nest failure rates, which indicates the mean number of young leaving each nest in a given year.

Seven species exhibit reduced FPBA over the past 42 years, indicating that their productivity has decreased over time: two red-listed species (Nightjar, Tree Pipit), two amber-listed species (Willow Warbler and Bullfinch) and three green-listed species (Coal Tit, Treecreeper and Chaffinch). While productivity of Nightjar and Willow Warbler has been falling consistently, trends for the other five species are curvilinear, increasing between the mid 1960s and mid 1980s and decreasing thereafter.

Productivity declines for the migrants Nightjar, Tree Pipit and Willow Warbler may be driven by changes in habitat or climate on their African wintering grounds or by declining insect numbers in the UK. Alternatively, climatic warming may have resulted in a developing asynchrony between laying dates and the availability of insect prey on the breeding grounds. Long-distance migrants are thought to be particularly susceptible to such disjunction but residents may also be affected, particularly those – such as Chaffinch – reliant on seasonal peaks in caterpillars. For increasing species such as Chaffinch and Coal Tit, however, we cannot exclude the possibility that breeding success has been density dependent and its decrease the result of an increase in intraspecific competition.

CES ringing data integrate productivity across the whole season, including juvenile survival in the first few weeks or months after fledging. According to this measure, productivity has fallen significantly for eight of the species monitored. The productivity of Garden Warbler, Goldfinch and Reed Bunting has fallen by more than 50% over the last 25 years, while Blackcap, Sedge Warbler, Song Thrush, Blackbird and Blue Tit show reductions of between 25% and 50%. For species such as Blackcap, Goldfinch and Blue Tit, where population increase has occurred, reductions in productivity may be driven by density-dependent processes, whereby increased competition for resources in an expanding population reduces the mean breeding success per pair.

Increased breeding success

Breeding success has improved very strongly for Redstart but its long-term population trend has been a shallow overall decline

Our best overall measure of breeding success is Fledglings Per Breeding Attempt (FPBA), calculated from brood sizes and nest failure rates, which indicates the mean number of young leaving each nest in a given year.

FPBA has increased significantly over the last 42 years for 29 species, across a wide range of taxonomic groups. Population trends are also upward for 14 of these species, including raptors (Sparrowhawk, Buzzard, Merlin, Barn Owl), pigeons (Stock Dove, Woodpigeon, Collared Dove), corvids (Magpie, Jackdaw, Carrion Crow), and some small passerines (Reed Warbler, Nuthatch, Robin and Pied Wagtail). It is therefore possible that increasing productivity has contributed to the population growth exhibited by these species over recent decades.

Conversely, 15 species (Kestrel, Tawny Owl, Skylark, Sedge Warbler, Starling, Dipper, Blackbird, Redstart, Wheatear, Dunnock, House Sparrow, Tree Sparrow, Grey Wagtail, Meadow Pipit and Yellowhammer), have declined in number as FPBA has increased, suggesting that a density-dependent reduction in intraspecific competition may have enabled breeding success to rise.

CES ringing data integrate productivity across the whole season, including juvenile survival in the first few weeks or months after fledging. According to this measure, productivity has risen significantly for two of the species monitored (Reed Warbler and Chaffinch).

Early breeding

Magpies now lay their first egg around 24 March, whereas in 1968 the average date was 24 April

Data from the Nest Record Scheme provide strong evidence of shifts towards earlier laying in a range of species, linked to climatic change. We have now identified 42 species that, on average, are laying between one and 31 days earlier, on average, than in the mid 1960s. Only six species exhibit significant trends towards later laying.

The species now laying earlier in the year represent a wide range of taxonomic and ecological groups, including raptors (Kestrel – 7 days), waterbirds (Moorhen – 7 days), waders (Oystercatcher – 7 days), migrant insectivores (Pied Flycatcher – 11 days, Swallow – 8 days), resident insectivores (Robin – 8 days, Blue Tit – 11 days), corvids (Magpie – 31 days) and resident seed-eaters (Greenfinch – 16 days).

For some species these shifts towards earlier laying may be insufficient to match seasonal advances in the peaks of food availability. Recent research has shown that significantly stronger phenological responses to climate change are displayed by organisms occupying lower trophic levels (such as the food birds eat) than those at higher levels (including the birds themselves), increasing the potential for disjunction and resulting population declines among birds.

Introduction

Since its formation in 1933, BTO has been deeply committed to gathering quantitative information on the bird populations of the UK. Its nationwide network of skilled volunteers, many of whom are long-term contributors to survey schemes, provides the ideal way to monitor the bird populations that are widely distributed across the countryside. BTO data, from such schemes as the Common Birds Census, Nest Record Scheme and BTO/JNCC/RSPB Breeding Bird Survey, have been increasingly influential in determining nature conservation policy in the UK. The partnership between JNCC and BTO has ensured that these schemes are operated and developed so as to provide high-quality information for nature conservation.

The value of the monitoring work undertaken by the BTO was recognised in the Government's Biodiversity Steering Group report (Anon. 1995). The BTO's results, particularly those regarding declining farmland species, are highlighted as an example of the way in which broad-scale surveillance techniques can identify significant new trends. More generally, the report states that monitoring is essential if the broad aims, specific objectives and precise targets of the Government's Biodiversity Action Plans are to be achieved. It notes that:

- baselines must be established;
- regular and systematic recording must be made, to detect change; and
- the reasons for change should be studied, to inform action.

The BTO's monitoring schemes fulfil a considerable portion of these needs for a wide range of bird species in the UK.

The system of alerts, derived from the BTO's census and nest record data, ensures that conservation bodies are quickly made aware of important demographic changes. Multi-species *indicators*, making extensive use of BTO census data, track how bird populations are faring generally across the countryside, UK-wide and within specific regions or habitats. These indicators were developed in association with Government and some have been adopted by them as policy drivers. More recently, European bird indicators have been developed (PECBMS 2012b).

Monitoring UK breeding birds

Long-running bird surveys operated by BTO contribute to an overall programme of Integrated Population Monitoring (IPM) that has been developed by the BTO, in partnership with JNCC, to monitor the numbers, breeding performance and survival rates of a wide range of bird species. IPM has the following specific aims (Baillie 1990, 1991):

1. to establish thresholds that will be used to notify conservation bodies of requirements for further research or conservation action;
2. to identify the stage of the life cycle at which demographic changes are taking place;
3. to provide data that will assist in identifying the causes of such changes; and
4. to distinguish changes in population sizes or demographic rates induced by human activities from those that are due to natural fluctuations.

Changes in numbers of breeding birds have been measured by:

- the BTO/JNCC/RSPB Breeding Bird Survey (BBS) – which began in 1994 and replaced the CBC (below) as the major monitoring scheme for landbirds, after a seven-year overlap. BBS is based on around 3,000 1-km squares, within each of which birdwatchers count and record birds in a standardised manner along a 2-km transect. Because the survey squares are chosen randomly, the results are representative of all habitats and regions. Combined CBC/BBS indices now provide long-running and ongoing population monitoring for many common birds.
- the *Common Birds Census* (CBC) – which ran from 1962 to 2000. This scheme mapped the breeding territories of common birds through intensive fieldwork on 200–300 mainly farmland and woodland plots each year, averaging about 70 and 20 ha respectively.
- the Waterways Breeding Bird Survey (WBBS) – which began in 1998 and replaced the WBS (below) as the major monitoring scheme for breeding birds along rivers and canals, after a ten-year overlap. It is a transect scheme akin to BBS but with the transects running alongside linear waterways. Transects comprise up to ten 500-m sections and cover typically 3–3.5 km of bird-rich habitat. Around 250–300 sites are covered each year, mostly randomly selected. Combined WBS/WBBS indices now provide long-running and ongoing population monitoring for many common waterside birds.
- the *Waterways Bird Survey* (WBS) – which ran from 1974 to 2007. WBS observers mapped the territories of birds along rivers, streams and canals on 80–130 plots each year, each on average 4.5 km in length. Around 70 of these sites are currently incorporated within WBBS.
- the Constant Effort Sites scheme (CES) – which began in 1983 and is based on breeding-season bird ringing at over 100 sites. The catching effort is kept constant at each site during each year, so that changes in numbers of birds caught will reflect population changes and not variation in catching effort.
- the Heronries Census – through which counts of 'apparently occupied nests' have been collected from a high proportion of the UK's heronries every year since 1928.

Changes in breeding performance are measured by:

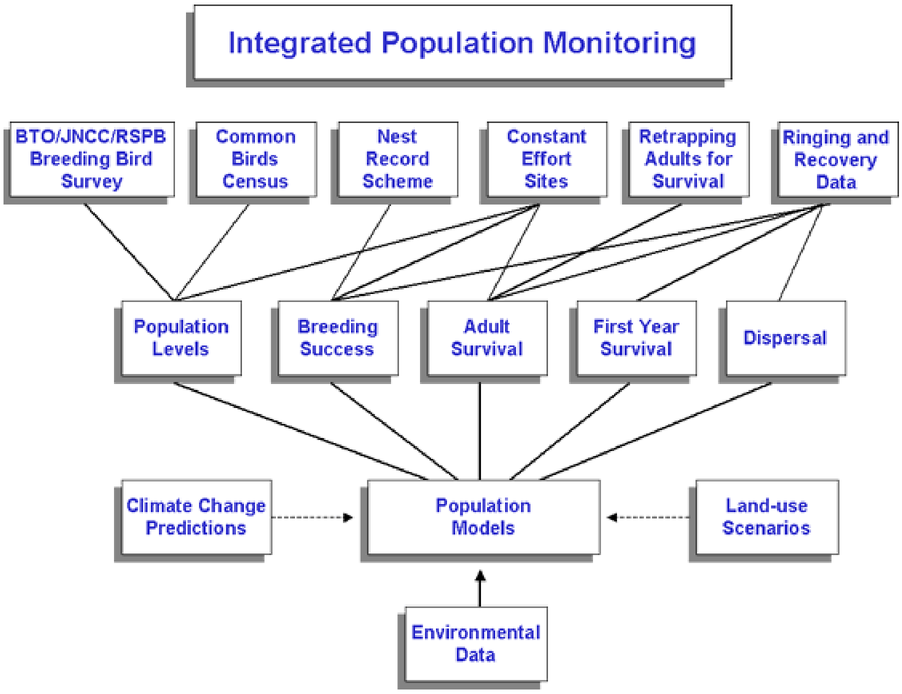
- the Nest Record Scheme – which began in 1939 and collates standardised information on up to 35,000 individual nesting attempts per year. This allows the measurement of:
  - laying dates
  - clutch sizes
  - brood sizes
  - nesting success during egg and chick stages
  - fledglings per breeding attempt (integrating success across all nesting stages).

- CES (see above) – which provides information on overall productivity for a range of species by measuring the ratio of juveniles to adults caught each year.

Changes in survival are measured by:

- the British and Irish Ringing Scheme – which provides information on the finding circumstances and longevity of ringed birds found dead by members of the public.
- CES also provides information on survival rates, based on the recapture of ringed birds at constant-effort sites.
- Further information on survival rates is provided through the Retrapping Adults for Survival scheme (RAS).

The ways in which the schemes fit together are shown in the diagram below, which also demonstrates the way in which the BTO aims to combine all this information, using population models, to elucidate the mechanisms behind the changes we observe in population size.


Integrated Population Monitoring
BTO/JNCC/RSPB Breeding Bird Survey
Common Birds Census
Nest Record Scheme
Constant Effort Sites
Retrapping Adults for Survival
Ringing and Recovery Data
Population Levels
Breeding Success
Adult Survival
First Year Survival
Dispersal
Climate Change Predictions
Population Models
Land-use Scenarios
Environmental Data

Combining results from different schemes

Monitoring the changes in the size of a population does not in itself provide sufficient information on which to base an effective conservation strategy (Goss-Custard 1993, Furness & Greenwood 1993). Concurrent monitoring of breeding performance and survival rates is necessary to allow changes in population size to be properly interpreted (Temple & Wiens 1989, Crick *et al.* 2003) and, for long-lived species, can provide early warning of impending conservation problems (Pienkowski 1991).

Where good long-term data sets for breeding performance and survival are lacking, conservation action might have to be taken without an adequate understanding of the mechanisms involved or might need to wait years for detailed research to be undertaken. For many species, however, BTO already holds the necessary data, collected by its volunteers over periods of several decades (Greenwood 2000).

For a long-lived species, a decline in population may not begin until a long period of low survival or reduced reproductive output has already passed. The classic example is that of the Peregrine, which in the UK suffered from poor breeding performance during the 1940s and 1950s due to sub-lethal DDT contamination. This drop in productivity decreased the capacity of the non-breeding section of the population to buffer the severe mortality of breeding adults that occurred due to cyclodiene poisoning from the mid 1950s onwards (Ratcliffe 1993). Monitoring of breeding performance gave an early warning of impending numerical decline (Pienkowski 1991). Another example of a decline in breeding performance that presaged population decline is the catastrophic breeding failures of seabirds, particularly Arctic Terns, in Shetland (Monaghan *et al.* 1989, 1992, Walsh *et al.* 1995, Mavor *et al.* 2003, 2004, Wanless *et al.* 2005).

Farmland birds

During the mid 1980s, the BTO identified rapid declines in the population sizes of several farmland bird species (O'Connor & Shrubb 1986, Fuller *et al.* 1995). The BTO has since been able to investigate the demographic mechanisms underlying these declines, using its long-term historical data sets (Siriwardena *et al.* 1998a, 2000a).

This investigation, which was funded by Government and undertaken jointly with Oxford University, looked at changes in population size, breeding performance and survival rates of a variety of species in relation to changing farming practice. It showed that species responded to different aspects of the agricultural environment, but that typically these aspects were linked to intensification or regional specialisation. Declines in survival rates were found to be the main factor driving population decline in these species, with the exception of Linnet, for which the main factor appears to have been a decline in nesting success at the egg stage (Siriwardena *et al.* 2000b). The study was therefore able to eliminate some possible causes of change, and identify areas for future research, thus helping conservation bodies to use their scarce resources productively. This work made an important contribution to the wider programme of work on farmland birds undertaken by many research and conservation organisations (Aebischer *et al.* 2000, Vickery *et al.* 2004).

This report describes a number of other cases where the combined analysis of BTO data sets has helped to identify the causes of population declines, for example on the pages for Lapwing (Peach *et al.* 1994), Song Thrush (Baillie 1990, Thomson *et al.* 1997, Robinson *et al.* 2004), Sedge Warbler (Peach *et al.* 1991), Willow Warbler (Peach *et al.* 1995a), Spotted Flycatcher (Freeman & Crick 2003), Starling (Freeman *et al.* 2002, 2007b), and House Sparrow (Freeman & Crick 2002). A fully integrated approach, estimating trends in numbers and demographic parameters through a single model containing data from various BTO surveys, has been introduced by Besbeas *et al.* (2002). More recently, the use of state-space models and Bayesian techniques for integrated monitoring has been pioneered by Baillie *et al.* (2009).

Biodiversity Action Plans

The ability to quickly determine the stage of the life-cycle most heavily involved during population declines is particularly important for the conservation agencies when considering the plight of species on the lists of conservation concern. Analysis of BTO data sets, which has already helped to build these lists, is a key point in several of the UK Government's Biodiversity Action Plans for rapidly declining species. Once conservation actions have been initiated, the BTO's Integrated Population Monitoring programme has a further function, because the success of these actions will be measured and assessed by continued BTO monitoring.

The aims of this report

The report is the latest in a series, begun in 1997, produced under the BTO's partnership with the Joint Nature Conservation Committee (on behalf of Natural England, Scottish Natural Heritage, Natural Resources Wales, and the Council for Nature Conservation and the Countryside) as part of its programme of research into nature conservation.

Only the first two reports were published on paper, with subsequent ones being produced solely as web documents. A complete list of all the previous reports and links to those published online can be found here. The first 12 reports were titled *Breeding Birds in the Wider Countryside: their conservation status*, with 'birdtrends' as the link to the web pages and 'wider countryside report' as their informal title. 'BirdTrends' is now the informal title of the report, matching the web link.

The current report in the series is used by conservation practitioners as a ready reference to changes in status among breeding birds in the UK. By publishing it on the BTO website, we aim to make it available to a much wider audience, especially to BTO members and the general birdwatching public. We hope that it also provides a useful resource for schools, colleges and universities, the media, ecological consultants, decision-makers, local government, and the more general world of industry and commerce. In summary, its aims are:

1. To provide, to as wide a readership as possible, a species-by-species overview of the trends in breeding population and reproductive success of birds covered by BTO monitoring schemes since the 1960s, at the UK or UK-country scale.
2. To provide warning alerts to JNCC and country agencies and to other conservation bodies about worrying declines in population size or reproductive success, with special reference to species on the UK red and amber lists.

This document is the result of the sustained fieldwork of many thousands of the BTO's volunteer supporters. Without their enthusiasm, the cause of conservation in the UK would be very much the poorer.The data we present here include information on distributions, from breeding-season and winter atlas projects, and on estimates of the absolute size of breeding populations, which are reported at intervals by the Avian Population Estimates Panel (Stone *et al.* 1997, Baker *et al.* 2006, Musgrove *et al.* 2013). Colonial seabirds, which are well covered by the results of Seabird 2000 (Mitchell *et al.* 2004) and by the JNCC's Seabird Monitoring Programme, and the majority of species covered by the Rare Breeding Birds Panel (Holling & RBBP 2007b, 2008, 2009, 2010a, 2010b, 2011b, 2012), are not included here. Wintering populations of waterfowl are covered by the Wetland Bird Survey annual reports (e.g. Holt *et al.* 2012a) and by the *WeBS alerts* system (Thaxter *et al.* 2010).

The main emphasis of this report is on trends in the abundance and demography of individual species. The data on trends in abundance also provide the basis for multi-species *indicators* of bird population changes (Gregory *et al.* 2004). Four indicators of trends in breeding birds are part of the UK Government's 18 Biodiversity Indicators, which track the UK's progress towards international targets set by the Convention on Biological Diversity in October 2010. This approach has been extended more widely through a collaboration between EBCC, BirdLife and RSPB to produce pan-European bird indicators.

Acknowledgements

Volunteer fieldwork

Our biggest thankyou is to the volunteers who collected the data on which this website is based. The population trends and other results that we present rely on the sustained, long-term fieldwork of many thousands of BTO volunteers. Our knowledge of the conservation status of the UK's bird populations is possible only as a result of their dedication and enthusiasm. The conservation community owes them all an enormous debt of gratitude for their work. We are also very grateful to the many farmers, land managers and landowners who permitted census work, nest recording and ringing to take place on their land.

Report production and analysis

This website presents the latest in a series of reports, prepared within the partnership between the British Trust for Ornithology (BTO) and the Joint Nature Conservation Committee (JNCC) (on behalf of the Council for Nature Conservation and the Countryside, Natural England, Natural Resources Wales and Scottish Natural Heritage), as part of its programme of research into nature conservation.

Mr and Mrs J A Pye's Charitable Settlement provided additional support towards the development of the website.

Our report includes results from the Breeding Bird Survey, which is funded jointly by BTO, JNCC and RSPB. The BBS partners are very grateful to the Environment and Heritage Service in Northern Ireland (now Northern Ireland Environment Agency) and to the Royal Society for the Protection of Birds in Scotland for supporting professional surveys in areas that would otherwise be difficult to cover.

Deborah Procter of JNCC provided helpful discussions, comments and support during the production of this report. Helen Baker, Jacquie Clark, Nigel Clark, David Gibbons, Jeremy Greenwood, Rowena Langston, Ian McLean, Ian Mitchell, David Stroud, Pierre Tellier, Malcolm Vincent and Lawrence Way provided helpful comments on earlier editions of this publication.

The analyses would not have been possible without the hard work of many past and present BTO staff who have organised schemes, collated data sets or overseen analyses, including: Sue Adams, Dawn Balmer, Jeremy Blackburn, Jacquie Clark, Mark Collier, Greg Conway, Rachel Coombes, Humphrey Crick, Steve Freeman, Mark Grantham, Bridget Griffin, Andrew Joys, Mike Raven, Brenda Read, Anna Renwick, Richard Thewlis, Anne Trewhitt and Jane Waters.

The work is also heavily dependent on the BTO's computer and database systems overseen jointly by Karen Wright (with Iain Downie). Susan Waghorn, Laura Smith and Mandy Andrews exercised great skill and effort in helping to design and build the website. The site is now maintained by William Skellorn.

We are very grateful to all of the above organisations and individuals for their contributions to this report.

Methods

Eight monitoring schemes have contributed data to this report. Six provide data on changes in abundance: these are the Breeding Bird Survey, Common Birds Census, Waterways Breeding Bird Survey, Waterways Bird Survey, Heronries Census and the Constant Effort Sites ringing scheme. Two schemes, the Nest Record Scheme and Constant Effort Sites, provide data on changes in breeding productivity. Data on survival rates come from detailed analyses of the retrappings and recoveries of ringed birds, from Retrapping Adults for Survival, Constant Effort Sites and the general Ringing Scheme. In addition, information on waterbirds, from the Wetland Bird Survey, is included where relevant.

The methodologies of the monitoring schemes are described below, including information on fieldwork, data preparation, sampling considerations and the statistical methods used in analysis. Most of the analyses and the preparation of tables and graphs were undertaken using SAS software (SAS 2009, 2010).

Breeding Bird Survey

Common Birds Census

Combined CBC/BBS trends

Waterways Bird Survey and Waterways Breeding Bird Survey

Heronries Census

Constant Effort Sites scheme

Retrapping Adults for Survival scheme

Nest Record Scheme

There are two further sections to the methods. These deal, first in descriptive terms and second in statistical detail, with the system by which the results of monitoring surveys raise alerts and thereby are brought to the attention of conservation bodies.

The alert system

Statistical methods used for alerts

Breeding Bird Survey

The BTO/JNCC/RSPB Breeding Bird Survey (BBS) was launched in 1994, following two years of extensive pilot work and earlier desk-based studies. The introduction of the BBS was a move designed to overcome the limitations of the Common Birds Census (CBC), which had monitored bird populations since 1962. In particular, it improves the geographical representativeness of UK bird monitoring, thus boosting coverage of species and of habitats.

The BBS uses line transects rather than the more intensive territory-mapping method that was used by the CBC. This makes the survey relatively quick to undertake, and has been successful in encouraging a large number of volunteers to take part. The average time observers spend per visit on counting birds is only around 90 minutes. Sampling units are the 1x1-km squares of the Ordnance Survey national grid, of which there are some 254,000 in the UK. From these we make random selections, by computer, for inclusion in the scheme (see Square selection, below). The BBS requires a relatively large sample of survey squares, and the initial aim was to achieve coverage of about 2,500 squares.

An important aspect of BBS is its coordination through a network of volunteer BBS Regional Organisers. Each year, information and survey forms are distributed first to these organisers, who contact volunteers willing to conduct the fieldwork. After the field season, forms are returned to BTO headquarters again via the Regional Organisers, but an alternative, on-line method for submission of BBS data was introduced in 2003 is now used by a high proportion of observers – see the BBS pages of the main BTO website for details.

Fieldwork involves three visits to each survey square each year. The first is to record details of habitat and to establish or re-check the survey route, while the second and third (termed 'early' and 'late') are to count birds. A survey route is composed of two roughly parallel lines, each 1 km in length, although for practical reasons routes typically deviate somewhat from the ideal. Each of these lines is divided into five sections, making a total of ten 200-m sections, and birds and habitats are recorded within these ten units. The two bird-count visits are made about four weeks apart (ideally in early May and early June), ensuring that late-arriving migrants are recorded. Volunteers record all the birds they see or hear as they walk along their transect routes. Birds are noted in three distance categories (within 25 m, 25–100 m, or more than 100 m on either side of the line, measured at right angles to the transect line), or as in flight. Recording birds within distance bands provides a measure of bird detectability in different habitats and thus allows population densities to be estimated more accurately. The total numbers of each species, excluding juveniles, are recorded in each 200-m transect section and distance category, as well as the timing of the survey and weather conditions.

By 1998, more than 2,300 BBS squares were being surveyed annually, close to the original target of 2,500. Only around a quarter of these plots were covered in 2001, owing to Foot & Mouth Disease access restrictions, but (thanks to our keen observers) the sample recovered immediately to over 2,100 in 2002 and had increased further to 2,254 squares in 2003, 2,526 in 2004, 2,879 in 2005 and 3,295 in 2006. The sample soared to 3,651 in 2007 and is currently running at over 3,200 (Risely *et al.* 2012). Squares are distributed throughout the UK and cover a broad range of habitats, including uplands and urban areas. There are 108 species that are present on 40 or more BBS squares annually and so can be monitored with good precision at the UK scale (Joys *et al.* 2003, Risely *et al.* 2012), although a few present special difficulties because of their colonial or flocking habit or their wide-ranging behaviour. For most of these 108 species, BBS can also assess annual population changes within England alone, using data from 30 or more squares, and for about half the species also within Scotland and Wales as separate units. Sample sizes in Northern Ireland already allow more than 30 species to be indexed annually.

Square selection

Survey squares are chosen randomly using a stratified random sampling approach from within 83 sampling regions. These sampling regions, which in most cases are the standard BTO regions, are the 'strata' (literally layers) of the sample. Survey squares are chosen at random within each region, to a density that varies with the number of BTO members resident there. Regions with larger numbers of potential volunteers are thereby allotted a larger number of squares, enabling more birdwatchers to become involved in these areas. This does not introduce bias into the results because the analysis takes the differences in regional sampling density into account (see below).

Data analysis

Change measures between years are assessed using a log–linear model with Poisson error terms. For each species and square, counts are summed across all sections and distance bands for each visit ('early' and 'late') and the higher value is used in the model (or the single count if the square was visited only once). Counts are modelled as a function of square and year effects. Each observation is weighted by the number of 1-km squares in each region divided by the number of squares counted in that region, to correct for the differences in sampling density between regions. The upper and lower confidence limits of the changes indicate the certainty that can be attached to each change measure. When the limits are both positive or both negative, we can be 85% confident that a real change has taken place (see here for details).

Trends are presented as graphs in which annual population indices are shown in blue and their 85% confidence limits in green. A caveat, 'small sample', is provided against the trends for England, Northern Ireland, Wales and Scotland where the mean sample size is between 30 and 40 plots per year. A minimum average sample size of 40 plots is required for the UK trends.

Go to the BBS section of the main BTO website.

Common Birds Census

The Common Birds Census (CBC) ran from 1962 to 2000 and was the first of the BTO's schemes for monitoring population trends among widespread breeding birds. It has now been superseded for this purpose by BBS.

The CBC was instigated to provide sound information on farmland bird populations in the face of rapid changes in agricultural practice. Although the original emphasis was on farmland, woodland plots were added by 1964. Fieldwork was carried out by a team of 250–300 volunteers. The same observers surveyed the same plots using the same methods year after year. On average, plots were censused for around seven consecutive years but a few dedicated observers surveyed the same sites for more than 30 years. Farmland plots averaged around 70 hectares in extent. Woodland plots were generally smaller, averaging just over 20 hectares. A small number of plots of other habitats, including heathlands and small wetlands, were also surveyed annually, especially before 1985.

A territory-mapping approach was used to estimate the number and positions of territories of each species present on each survey plot during the breeding season. Volunteers visited their survey plots typically eight to ten times between late March and early July and all contacts with birds, either by sight or sound, were plotted on outline maps at a standard scale of 1:2,500. Codes were used to note each bird's species, with sex and age where possible, and also to record activity such as song or nest-building. The registrations were then transferred to species maps and returned to BTO headquarters for analysis. The pattern of registrations on the species maps reveals the numbers of territories for each species. All assessments of territory number were made by trained BTO staff, applying rigorous guidelines, to ensure consistency between estimates across sites and years. Observers also provided maps and other details of the habitat on their plots. This makes it possible to match the distribution of bird territories with habitat features, providing the potential for detailed studies of bird–habitat relationships.

In 1990, the results from the Common Birds Census were brought together in the book*Population Trends in British Breeding Birds*(Marchant *et al.* 1990). This landmark publication discussed long-term population trends for the years 1962 to 1988 for 164 species, with CBC or Waterways Bird Survey population graphs for around two-thirds of these.

The results from the Common Birds Census (CBC) provided reliable population trends for more than 60 of the UK's commoner breeding species and, through the linking of CBC with BBS, continue to be hugely influential in determining conservation priorities in the UK countryside. The store of detailed maps of almost a million birds' territories, collected through the CBC and maintained by BTO since the early 1960s, is a uniquely valuable resource for investigating the relationships between breeding birds and their environment, over wide temporal and spatial scales.

The weaknesses of the CBC as a monitor of UK bird populations were largely related to the time-consuming nature of both fieldwork and analysis. This inevitably limited the number of volunteers able to participate in the scheme, with the result that areas with few birdwatchers were under-represented. Constrained by its relatively small sample size, CBC concentrated on farmland and woodland habitats. Bird population trends in built-up areas and the uplands were therefore poorly represented. Furthermore, as the plots were chosen by the observers, some may not have been representative of the surrounding countryside and some bias towards bird-rich habitats might be suspected. It is for these reasons that the BBS was introduced in 1994. The two surveys were run in parallel for seven years to allow calibration between the results: for many species, CBC and BBS trends can be linked to form joint CBC/BBS trends that provide ongoing monitoring, continuous since the 1960s (Freeman *et al.* 2003, 2007a).

Validation studies

The CBC was the first national breeding bird monitoring scheme of its kind anywhere in the world and its value has been widely recognised internationally. The territory-mapping method adopted by the CBC is acknowledged as the most efficient and practical way of estimating breeding bird numbers in small areas, and has been well validated. Although intensive nest searches may sometimes reveal more birds, a comparison by Snow (1965) concluded that mapping censuses were a good measure of the true breeding population for 70% of species. Experiments to test differences between observers' abilities to detect birds found that, although there was considerable variation between individual abilities, the observers were consistent from year to year (O'Connor & Marchant 1981). As the CBC relies on data from plots covered by the same observer in consecutive years, this source of bias has no implications for the CBC's ability to identify population trends. It has also been confirmed that the sample of plots from which CBC results are drawn changed little in composition or character over the years (Marchant *et al.* 1990) and that the results of territory analysis are not affected by changes in analysts, once trained (O'Connor & Marchant 1981). Fuller *et al.* (1985) found that farmland CBC plots were representative of ITE lowland land-classes throughout England (excluding the extreme north and southwest), and closely reflected the agricultural statistics for southern and eastern Britain.

Data analysis

Population changes are modelled using a generalised additive model (GAM), a type of log–linear regression model that incorporates a smoothing function (Fewster*et al.* 2000). This has replaced the Mountford model that employed a six-year moving window (Mountford 1982, 1985, Peach & Baillie 1994) and was used to produce annual population indices until 1999, but the principles are similar. These models are also very similar to log–linear Poisson regression as implemented by program TRIM (Pannekoek & van Strien 1996). Counts are modelled as the product of site and year effects on the assumption that between-year changes are homogeneous across plots. Smoothing is used to remove short-term fluctuations (e.g. those caused by periods of severe weather or by measurement error) and thus reveal the underlying pattern of population change. This is achieved by setting the degrees of freedom to about 0.3 times the number of years in the series. Confidence limits on the indices are estimated by bootstrapping (a resampling method; Manly 1991) to avoid making any assumptions about the underlying distribution of counts.

Indices are plotted as the blue line on the graphs, and provide a relative measure of population size on an arithmetic scale relative to an arbitrary value of 100 in one of the years of the sequence. If an index value increases from 100 to 200, the population has doubled; if it declines from 100 to 50, it has halved. The two green lines on the graphs, above and below the index line, are the upper and lower 85% confidence limits. A narrow confidence interval indicates that the index series is estimated precisely, and a wider interval indicates that it is less precise. The use of 85% confidence limits allows relatively straightforward comparison of points along the modelled line: non-overlap of the 85% confidence limits is equivalent to a significant difference at approximately the 5% level (Anganuzzi 1993).

Caveats are provided to show where the data suffer from a 'Small sample' if the mean number of plots was less than 20. Data are flagged as 'Unrepresentative?' if the average abundance of a species in 10-km squares containing CBC plots was less than that in other 10-km squares of the species' distribution in the UK (as measured from 1988–91 Breeding Atlas data (Gibbons *et al.* 1993)) or, where average abundances could not be calculated, if expert opinion judged that CBC data may not be representative.

In practice nearly all CBC data included in this report have been combined with BBS data to provide joint CBC/BBS trends, using the methods described in the next section. These methods for producing joint trends represent an extension of those described above.

More information on Common Bird Census(PDF, 87.11 KB)
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CBC/BBS trends

CBC and BBS have been described separately in earlier sections. This page describes how the results have been combined to derive joint CBC/BBS trends, extending from the 1960s to the present.

As previously noted, the CBC has been an enormously influential project, providing the main source of information on national population levels in the UK since its inception in 1962. Coverage was predominantly in lowland England, where the numbers of potential volunteers are greatest, while coverage was more patchy in more sparsely populated regions and especially the uplands (Marchant *et al.* 1990). CBC plots were situated in a limited number of habitats, predominantly farmland and woodland. Within a large rectangle of southeastern Britain (covering England and Wales south and east from Seascale, Scarborough and Exeter), the plots are nevertheless believed to be broadly representative, at least of lowland land-classes (Fuller *et al.* 1985). For species such as Wood Warbler and Meadow Pipit that have the greater part of their numbers in the far west or north of Britain, however, the CBC may not have accurately reflected UK trends.

The BBS, on account of its more rigorous, stratified random sampling design, and its simplicity in the field, produces data that better cover the previously under-represented regions and habitats. In some early editions of 'Breeding Birds in the Wider Countryside' (e.g. Baillie *et al.* 2002), separate indices were published from CBC and BBS data, for those species with sufficiently large sample sizes. There being no new CBC data since 2000, however, it is unnecessary to present a CBC-only trend – except for those few species that are now so rare that BBS has been unable to contribute.

For most purposes, the presentation and analysis of longer time-series is required, dating back to before the establishment of the BBS but coming right up to the present day. The calculation of 25-year alert designations, as in this report, provides just one example. This need led the BTO to research the compatibility of indices from BBS and CBC data in various years and regions, and the possibility of deriving trustworthy long-term indices from the two data sources in combination (Freeman *et al.* 2003, 2007a). This research suggested that for the vast majority of species considered there was no significant difference between population trends, calculated from the two surveys, based on that part of the country where CBC data are sufficient to support a meaningful comparison. Where a statistically significant difference was found, this was sometimes for very abundant species for which the power to detect even a biologically insubstantial difference was considerable. Within this region, therefore, long-term trends based on CBC and BBS data can be produced for almost all species previously monitored by the CBC alone. For (Freeman *et al.* 2003, 2007a) this was the area covered by Fuller *et al.* (1985), because CBC plots in that region were shown to be representative of lowland farmland there. As this region covers the bulk of England, and for consistency with the rest of this report, we have produced joint indices for CBC/BBS for the whole of England (the CBC/BBS England index), rather than just the English part of the 'Fuller rectangle'.

A second question then is whether one can obtain reliable trends over the same period for the entire UK. That is, since prior to 1994 only CBC data are available, are the population trends within the region well covered by the CBC typical of those for the UK as a whole? The shortage of CBC data in the north and west means that the only way of investigating this is via the BBS data. Significant differences in trends between the area well covered by the CBC and the rest of the UK were found for approximately half the species (see Freeman *et al.* 2003, 2007a, for full details). For such species, a regional bias in CBC data means that no reliable UK index can be produced prior to 1994. In summary, joint population indices dating back to the start of the CBC can continue to be produced for that part of the country well served by the CBC (essentially England) for almost all common species. However, a similar UK index can be produced for only about 50% of species (CBC/BBS UK index).

This report presents joint CBC/BBS trends for the UK and/or England, as appropriate. Ideally the trends would have been estimated using generalised additive models (Fewster *et al.* 2000) but these were too computationally intensive, given the large number of sites involved. Therefore we fitted a generalised linear model, with counts assumed to follow a Poisson distribution, and a logarithmic link function, to the combined CBC/BBS data. Standard errors were calculated via a bootstrapping procedure and there is therefore no need to model overdispersion, as it does not affect the parameter estimates. BBS squares were weighted by the number of 1-km squares in each sampling region divided by the number of squares counted in that region as in standard BBS trend analyses. CBC plots were assigned the average weight of all BBS squares as this allows them to be incorporated within the analysis while retaining the convention of not applying weights within the BBS sample. The population trend was smoothed using a thin-plate smoothing spline with degrees of freedom about one third the number of years. Confidence intervals were calculated via a bootstrap procedure. Bootstrap samples were generated by resampling sites from the original data set, with replacement. A generalised linear model was then fitted to each bootstrap replicate and a smoothing spline fitted to the annual population indices as described above. Confidence limits were then calculated as the appropriate percentiles from the sets of smoothed estimates. The overall result is a smoothed trend that is mathematically equivalent to that produced from a generalised additive model. The method of estimation is less statistically efficient because the smoothing is not incorporated within the estimation procedure, and is likely to have resulted in more conservative statistical tests and wider confidence limits. However this compromise was necessary to make it possible to fit the trends within a reasonable amount of computer time (still several weeks).

Indices are plotted as the blue line on the graphs, and provide a relative measure of population size on an arithmetic scale relative to an arbitrary value of 100 in one of the recent years of the sequence. If an index value increases from 100 to 200, the population has doubled; if it declines from 100 to 50, it has halved. Note that positive and negative percentage changes are not directly equivalent: for example, a decrease of 20% would require an increase of 25% to restore the population to its former level. The two green lines on the graphs, above and below the index line, are the upper and lower 85% confidence limits. A narrow confidence interval indicates that the index series is estimated precisely, and a wider interval indicates that it is less precise. The use of 85% confidence limits allows relatively straightforward comparison of points along the modelled line: non-overlap of the 85% confidence limits is equivalent to a significant difference at approximately the 5% level (Anganuzzi 1993).

Waterways Bird Survey & Waterways Breeding Bird Survey

Waterways Bird Survey 1974–2007

The Waterways Bird Survey (WBS) monitored the population trends of up to 24 riparian bird species on canals and rivers throughout the UK during the period 1974–2007. WBS used a territory-mapping method like that of its parent scheme, the Common Birds Census, to estimate the breeding population of waterbirds on each of a number of observer-selected survey plots. Detailed territory maps were prepared alongside habitat data that show which features of linear waterways are important to breeding birds. The plots averaged 4.4 km in length. Almost half were slow-flowing lowland rivers with the rest either fast-flowing rivers/streams or canals. In the scheme's closing years there were around 90 plots distributed throughout the UK. The north and west of Britain were better represented by WBS than by the CBC although, as with CBC, coverage outside England was relatively poor (Marchant *et al.* 1990).

All fieldwork was carried out by BTO volunteers. Observers were asked to survey their plots on nine occasions between March and July, mapping all the birds seen or heard onto 1:10,000 ('six-inch') maps. Registrations were then transferred to species maps, which were analysed to reveal the numbers and positions of territories for each species. For the first 20 years all territory analysis was performed by trained headquarters staff but, during 1994–2007, observers mostly completed their own territory analysis, based on the scheme's written guidelines, with results checked and corrected by BTO staff. As WBS employed very similar methods to those of CBC, the validation studies carried out for the latter generally held true for WBS (see CBC section). Marchant *et al.* (1990) found that there had been little change by 1988 in the composition of the WBS sample, in terms of waterway type or geographical spread.

Population changes along waterways have been reported historically for up to 25 riparian species. For specialist waterbirds, including Little Grebe, Mute Swan, Common Sandpiper, Kingfisher, Sand Martin, Grey Wagtail, Dipper and Reed Warbler, targeted surveys along waterways can provide a better precision of monitoring than is possible through the more generalised BBS surveys. Goosander is not covered at all as yet by BBS monitoring. Waterways indices can also add a new perspective on trends in waterbirds that are monitored, largely in different habitats, by CBC/BBS. For Lapwing, populations declined rapidly on arable farmland during the late 1980s while numbers on WBS plots, typically representing populations along river floodplains, were more stable. Yellow Wagtails have declined much more steeply alongside rivers and canals than elsewhere.

Waterways Breeding Bird Survey and joint indices

WBS had similar limitations as a monitoring scheme that led to the CBC's replacement by BBS. In particular, plot distribution was biased geographically and possibly also towards sites that were good for birds, and an intensive survey method was used that severely limited the sample size (Marchant *et al.* 1990). A drawback specific to WBS was that it covered only waterbirds.

BTO addressed these issues by setting up the Waterways Breeding Bird Survey (WBBS), which ran in parallel with WBS from 1998 to 2007 and now outlives it as a permanent annual survey, supplementing BBS. WBBS uses BBS-style transect methods along random waterways, and includes all species of birds (and mammals, too). WBBS has received some of its funding from the Environment Agency.

In a similar development to joint CBC/BBS indices, it has proved possible to link the two waterways schemes to provide joint WBS/WBBS indices, some dating back to 1974, for the species previously covered by WBS (see below).

Data analysis

Population trends are generated from the combined WBS and WBBS data using a Generalised Linear Model with counts assumed to follow a Poisson distribution and a logarithmic link function. Standard errors were calculated via a bootstrapping procedure involving 199 replications. For presentation in the figures, both the population trend and its confidence limits were also subsequently smoothed using a thin-plate smoothing spline. The overall result is a smoothed trend that is mathematically equivalent to that produced from a generalised additive model, as previously used for the WBS data alone.

More information on

WBS (PDF, 77.53 KB)
and WBBS.

Heronries Census

As predators at the top of the freshwater food chain, Grey Herons are excellent indicators of environmental health in the countryside. They build large stick nests, mostly in colonies at traditional sites, thus lending themselves to censuses of active nests.

The BTO Heronries Census began in 1928 and is the longest-running breeding-season bird monitoring scheme in the world. The aim of this census is to collect annual nest counts of Grey Herons from as many sites as possible in the United Kingdom. Volunteer observers make counts of 'apparently occupied nests' at heron colonies each year. Changes in the numbers of nests, especially over periods of several years, provide a clear measure of the population trend.

In recent seasons, observers have also counted the nests of Little Egrets *Egretta garzetta*, which have been appearing in an increasing number of southern heronries since the first breeding records in 1996, and even of Cattle Egrets *Bubulcus ibis,* Night-herons *Nycticorax nycticorax* and Spoonbills *Platalea leucorodia.* Since egrets are fully included in the Heronries Census, data are required from all breeding sites, whether or not Grey Herons are also present. Counts of Cormorant colonies, which often occur alongside heronries, are also welcome (Newson *et al*. 2007).

Coverage is coordinated through a network of regional organisers. A core of birdwatchers and ringers monitor their local colonies annually, providing a backbone of regular counts. Around two-thirds of the heronries in England and Wales are currently counted each year, with more-complete censuses carried out in 1929, 1954, 1964, 1985 and 2003. Historically rather few counts have been made of heronries in Scotland and Northern Ireland, except during the special surveys, but support there for the Heronries Census has been growing fast in recent years.

Counts are submitted mostly on cards and the data are entered onto computer at BTO headquarters. The number of heronries counted each year has grown in recent years to more than 500.

Data analysis

Population changes are estimated using a ratio-estimators approach derived from that of Thomas (1993). Essentially, the ratios of the populations in any two (not necessarily consecutive) years of the survey are estimated from counts at sites visited in each of those years. These ratios can be used to estimate the counts at sites that were not visited, and hence build an estimate of the total population. Further modifications have been made to allow for the extinction of colonies and the establishment of new ones (Marchant *et al*. 2004).

On the Grey Heron page of this report, the UK trend is presented graphically with annual estimates in blue and their 85% confidence limits in green. A smooth trend line in red is based on a non-parametric regression model, using thin-plate smoothing splines with 24 degrees of freedom. Trends are also shown for England and Wales together, and for England, Wales and Scotland alone.

Click here to visit the Heronries Census page of the main BTO website

Constant Effort Sites scheme

The Constant Effort Sites (CES) scheme uses changes in catch sizes across a network of standardised mist-netting sites to monitor changes in the abundance and breeding success of common passerines in scrub and wetland habitats. At each constant effort site, licensed ringers erect a series of mist nets in the same positions, for the same amount of time, during 12 visits evenly spaced between 1 May and 31 August (Peach *et al.* 1996). Year-to-year changes in the number of adults caught provide a measure of changing population size, while the ratio of young birds to adults in the total catch is used to monitor annual productivity (breeding success). By summing the abundance of young birds between May and August, the CES method should integrate contributions to annual productivity from the entire nesting season, including second and third broods for multi-brooded species, but will also include a small component of mortality during the immediate post-fledging period. More detailed information about analytical methods is given below and were also provided by Peach *et al.* (1998) (abundance) and Robinson *et al.* (2007) (productivity). Between-year recaptures of ringed birds are also used to calculate annual survival rates of adult birds using specialised analytical techniques (Peach 1993).

The CES scheme began in 1983 with 46 sites and now has around 120. The distribution of CES sites tends to reflect the distribution of ringers within Britain and Ireland. The majority are operated in England, and there are small numbers in Scotland, Wales, Northern Ireland and the Republic of Ireland. The CES routinely monitors the populations of 25 species of passerines in scrub and wetland habitats.

Data analysis

Smoothed trends in the abundance of adults and young are separately assessed using a generalised additive model (GAM), with 85% confidence intervals calculated by bootstrapping (Fewster *et al.* 2000). At sites where catching effort in a year falls below the standard 12 visits, but no more than four visits have been missed, annual catch sizes are corrected according to experience during years with complete coverage, by incorporating an offset into the GAM (see Peach *et al.* 1998 for full details). Sites with fewer than eight visits in a given year are omitted for the year in question.

Annual indices of productivity (young per adult) are estimated from logistic regression models applied to the proportions of juvenile birds in the catch, the year-effects then being transformed to measures of productivity relative to an arbitrary value of 100 in the most recent year. As above, catch sizes are corrected where small numbers of visits have been missed. It should be noted that these indices are relative, and are not estimates of the actual numbers of young produced per adult (Robinson *et al.* 2007).

Annual estimates of adult survival are derived from a form of the standard Cormack–Jolly–Seber capture–mark–recapture model (Lebreton*et al.* 1992) modified to account for the presence of transient birds. Transients are birds passing through the site, or perhaps living on its periphery, and which therefore have a much lower probability of capture than resident birds living in the vicinity of the nets. The presence of transients thus tends to decrease the estimated survival rates. We allow for this by introducing an additional 'survival period' in the year of first capture (Hines *et al.* 2003). As with our other schemes, we assume survival probabilities vary annually in a similar fashion across all sites, though mean survival probabilities may differ between sites. Because of the standardised capture protocol, we assume that recapture probabilities are site-specific, but constant through time. For each bird we also insert an additional period after the first capture, indicating whether the bird was caught subsequently in the same season. The probability of surviving this period can be regarded as the probability that the bird is resident on the site (that is the probability that it is available for recapture). The survival and recapture probabilities for this initial period are assumed constant across years and sites. Note that the annual estimates of annual survival presented are in fact the probability that adult birds return to the same CE site the following year; this will be lower (to a small but unknown extent) than the true survival rate. We do not estimate survival rates for juvenile birds, because of their much greater propensity to disperse.

Data presentation

Abundance and productivity data are presented graphically with the smoothed trend in blue and their 85% confidence limits in green. No trend is currently fitted to the survival data, but the individual estimates are presented in green with 95% confidence limits. A caveat is provided for 'Small samples' when the average number of plots per year is between 10 and 20.

Go to the CES section of the main BTO website.

Retrapping Adults for Survival scheme

RAS aims to provide information on adult survival for a range of species in a variety of habitats, particularly those not caught in sufficient numbers on CES sessions or during more general mist-netting. Each RAS project targets an individual species and operates within a defined study area, aiming to catch and/or resight the majority of the adults breeding within the site each year. The minimum annual sample size should ideally be sufficient to include 30 retraps or resightings from previous years, whilst maintaining a constant trapping/resighting effort. Each RAS study must run for a minimum of five years, but preferably much longer, to allow calculation of long-term survival rate trends.

As with CES, between-year recaptures of ringed birds can also be used to calculate annual survival rates of adults (Peach 1993), and RAS ringers often employ colour rings to increase the probability of detecting returning individuals. Further details of the analytical methods are given below, and examples of analyses of RAS data have been published by Robinson *et al.* (2008, 2010).

The RAS scheme was launched in 1998 and around 130 projects are currently active, covering 50 species in total, and data for nine of these are presented in this report. Overall, study sites are well distributed throughout the UK.

Data analysis

Annual estimates of adult survival are derived from a form of the standard Cormack–Jolly–Seber capture–mark–recapture model (Lebreton et al. 1992). As with our other schemes, we assume survival probabilities vary annually in a similar fashion across all sites, though mean survival probabilities may differ between sites. Where individuals can be sexed we include a sex-specific intercept, but assume survival varies similarly across years for both sexes; where few individuals of one sex are caught, we exclude these from the models. We model the annual recapture probabilities as a function of either the number days on which the RAS project operated in that year or the amount of effort recorded, choosing the one that best fits the data. Note that the annual estimates of annual survival presented are in fact the probability that adult birds are found to have returned to the same RAS site the following year; this will be lower (to a small but unknown extent) than the true survival rate. We do not estimate survival rates for juvenile birds, because of their much greater propensity to disperse.

Go to the RAS section of the main BTO website.

Nest Record Scheme

The BTO's Nest Record Scheme is the largest, longest-running and most highly computerised of such schemes in the world and possesses the most advanced and efficient techniques of data gathering, data capture and analysis (Crick *et al.* 2003). BTO now holds more than a million nest records, of which 35% are already computerised.

The primary aim of the Nest Record Scheme is to monitor the breeding performance of a wide range of UK birds annually as a key part of the BTO's data collection. Periodic reports are published in *BTO News* (e.g. Leech & Barimore 2008) and the significant results communicated immediately to JNCC. Another primary aim is to undertake detailed analyses of breeding performance of species of conservation interest (e.g. Crick *et al.* 1994, Brown *et al.* 1995, Peach *et al.* 1995a, Crick 1997, Chamberlain & Crick 1999, Siriwardena *et al.* 2001, Crick *et al.* 2002, Chamberlain & Crick 2003, Freeman & Crick 2003, Browne*et al.* 2005, Tryjanowski *et al.* 2006, Douglas *et al.* 2010).

The Nest Record Scheme gathers data on the breeding performance of birds in the UK through a network of volunteer ornithologists. Each observer is given a code of conduct that emphasises the responsibility of recorders towards the safety of the birds they record and explains their legal responsibilities. These observers complete standard nest record cards for each nest they find, giving details of nest site, habitat, contents of the nest at each visit and evidence for success or failure. When received by the BTO staff, the cards are checked, sorted and prepared for input and analysis. Data are prioritised for computer input according to their potential for population monitoring and for specific research projects. Those for Schedule 1 species are kept confidential. (These are species protected from disturbance at the nest by Schedule 1 of the Wildlife and Countryside Act 1981: they are generally rare species and the location of their nests may need to be protected from egg collecting (an illegal activity for every wild bird) or other potential disturbance. A special licence is required to visit any nest of a Schedule 1 species.) Computer programs developed by BTO check the data for errors and calculate first-egg date, clutch size, nest loss rates at egg and chick stages.

Currently the BTO collects a total of more than 30,000 records each year for around 180 species. Typically, there are more than 150 records for 55 species and more than 100 for a further 10–15 species. The quality of records improved substantially in 1990 with the introduction of a new recording card, which promotes greater standardisation and clarity in the information recorded by observers. The general distribution of completed Nest Record Cards is patchy at the county scale but is more even over larger regions of the UK. Overall, Northern Ireland and parts of Scotland (southeast, Western Isles) and parts of England (West Midlands, southwest) have relatively low coverage, often reflecting observer density. A major analysis of trends over time in various aspects of breeding performance found relatively few differences between major regions in the UK, when analysed using analysis of covariance (Crick *et al.* 1993). The scheme receives records from all the UK's major habitats. Most records come from woodland, farmland and freshwater sites, but the scheme also receives data from scrub, grassland, heathland and coastal areas.

Data analysis

Five different variables were analysed for this report: laying date (where day 1 = January 1); clutch size; brood size; and daily nest failure rates during egg and nestling stages, calculated using the methods of Mayfield (1961, 1975) and Johnson (1979) (see Crick *et al.* 2003 for a review).

To minimise the incidence of errors and inaccurately recorded nests, a set of rejection criteria was applied to the data: laying date included only cases where precision was within ±5 days; clutch size was not estimated for nests which had been visited only once, for nests which were visited when laying could still have been in progress, or for nests which were visited only after hatching; and maximum brood size was calculated only for nests which were observed after hatching. The last variable is an underestimate of brood size at hatching, because observers may miss early losses of individual chicks; it differs from clutch size because some eggs may be lost during incubation or fail to hatch.

Daily failure rates of whole nests were calculated using a formulation of Mayfield's (1961, 1975) method as a logit–linear model with a binomial error term, in which success or failure over a given number of days (as a binary variable) was modelled, with the number of days over which the nest was exposed during the egg and nestling periods as the binomial denominator (Crawley 1993, Etheridge *et al.* 1997, Aebischer 1999). Numbers of exposure days during the egg and nestling periods were calculated as the midpoint between the maximum and minimum possible, given the timing of nest visits recorded on each Nest Record Card (note that exposure days refer only to the time span for which data were recorded for each nest and do not represent the full length of the egg or nestling periods). Each calculation assumes that failure rates were constant during the period considered. Violations of this assumption of the Mayfield method can lead to biased estimates if sampling of nests is uneven over the course of each period. It is unlikely that any such bias would vary from year to year so, although absolute failure rates may be biased, annual comparisons should be unaffected (Crick *et al.* 2003). In this report, therefore, we present only temporal trends in daily nest failure rates.

As the combined influence of concurrent trends in these individual breeding parameters on overall productivity is difficult to assess, the estimates produced are used to derive an annual mean estimate of the number of 'fledglings produced per breeding attempt' (FPBA) according to the equation below (Crick *et al.* 2003):

$$FPBA = CS \times HS \times (1 - EF)EP \times (1 - YF)YP$$

where CS represents clutch size, HS represents hatching success, EF and YF represent egg- and chick-stage daily failure rates and EP and YP represent the length of the egg and nestling periods. Standard errors were derived using the formula given by Siriwardena *et al.* (2000b).

Statistical analyses of nest record data were undertaken using SAS programs (SAS 2009). Regressions through annual mean laying dates, clutch sizes and brood sizes were weighted by sample size. Nest survival was analysed by logistic regression. Quadratic regressions were used when the inclusion of a quadratic term provided a significant improvement over linear regression. These are described as 'curvilinear' in the tables on species pages. Significant linear trends are described as 'linear'. The best-fitting regressions (i.e. quadratic or linear) are presented on the figures in this report. Where neither regression is significant, the linear regression line is shown for illustrative purposes.

Results are presented only if the mean sample size of records for a particular variable and species exceeds ten per year, and are presented with a caveat for small sample sizes if the mean number of records contributing data was between ten and 30 per year.

Go to the Nest Record Scheme section of the BTO website.

Alert system

General approach

The alert system used within this report is designed to draw attention to developing population declines that may be of conservation concern, and is described in detail by Baillie & Rehfisch (2006). It also identifies situations where long-term declines have reversed, leading to an improvement in conservation status. It must be stressed that the changes reported here are advisory and do not supersede the agreed UK conservation listings (Eaton *et al*. 2009; see PSoB pages). They are based on similar criteria to *Birds of Conservation Concern*, however, and so provide an indication of likely changes at future revisions.

The system is based on statistical analyses of the population trend data for individual species. Alerts seek to identify rapid declines (>50%) and moderate declines (>25% but <50%). These declines are measured over a number of time-scales, depending on the availability of data – the full length of the available time series, and the most recent 25 years, 10 years and 5 years for which change can be estimated. The conservation emphasis is particularly on the longer periods, but short-term changes help to separate declines that are continuing – or accelerating – from those that have ceased or reversed.

The alerts are calculated annually using standard automated procedures. Where species are at the margin of two categories (e.g. a decline of about 25%) they may raise alerts in some years but not others, or different levels of alert in different years.

Data on some species might be biased, owing to possibly unrepresentative monitoring, or imprecise, owing to small sample sizes. Because these data often provide the only information that is available, our general approach is to report all the alerts raised but to flag up clearly any deficiencies in the data.

Smoothing population trends

Bird populations show long-term changes that do not follow simple mathematical trajectories. In addition to the long-term trends, annual population indices also show short-term fluctuations resulting from a combination of natural population variability and statistical error. We use smoothing techniques that aim to extract the long-term pattern of population change, without forcing it to follow any particular shape (such as a straight line or a polynomial curve). These methods remove most of the effects of short-term fluctuations (including any natural year-to-year variability) so that the long-term trend is revealed more clearly.

Technical details available here

Years used for analysis

Once a smoothed population trend has been calculated, change measures are calculated from the ratio of the smoothed population indices for the two years of interest. Population indices for the first and last years of a smoothed time series are less reliable than the others, and so we always drop them before calculating alerts. Because the latest year is not included, the alerts are therefore less up-to-date than they could be, but fewer false alarms are generated. The latest year's data points do contribute, however, to the smoothed curve and are dropped only after the smoothing has taken place.

The time it takes BTO to collate and analyse each year's intake of bird monitoring data is another factor affecting the years that can be included in these analyses. Full analyses of data sets are not usually all available until 12–15 months after the end of a particular breeding season. Thus for a report prepared in year *x* (e.g. 2012) we have analyses of monitoring data up to year (*x*-1) (e.g. 2011). As we drop the final year of the smoothed time series, we report here on change measures up to year (*x*-2) (e.g. 2010).

Long-term changes for most of the species included in this report are calculated from joint Common Birds Census and Breeding Bird Survey data (CBC/BBS indices). The CBC started on farmland in 1962 and on woodland in 1964. However, the early years of the CBC population indices are strongly influenced by the effects of the unusually severe winters of 1961/62 and 1962/63, as well as by developments in methodology (Marchant *et al.* 1990). Joint CBC/BBS indices have been calculated using only the data from 1966 onwards, therefore, and population changes are calculated back to 1967.

Confidence limits and statistical testing

We show 90% confidence limits for population change measures wherever possible. Any decline where the confidence limits do not overlap zero (no change) is regarded as statistically significant and will trigger an alert if it is of sufficient magnitude. Note that, because we are seeking to detect only declines, we are using a one-tailed test – with a *P* value of 0.05. These confidence limits therefore do not indicate whether increases are statistically significant.

The graphs of population trends show 85% confidence limits because these allow an approximate visual test of whether the difference between the index values for any two given years is statistically significant: if the index values for two given years are assumed to be independent, and normally distributed with standard errors of comparable size (standard errors differing by a factor of up to about 2 are quite acceptable), then to a good approximation the difference between them is significant at the 5% level if there is no overlap in their 85% confidence intervals (Buckland *et al.* 1992, Anganuzzi 1993). This test is fairly robust, and the independence assumption is reasonable if the years are well separated.

Technical details available here

Data-deficient species

There is uncertainty about the reliability of the results for some species, either because data may be unrepresentative or because they are based on a very small sample of plots. In these cases the cause of the uncertainty is recorded in the comment column of the population change table.

Unrepresentative data

In this report we present joint UK or England CBC/BBS trends only if there was no substantial or statistical difference between the trends from the two schemes over the period when they ran in parallel (Freeman *et al.* 2007a). Thus, since BBS results are drawn from a random sample, the trends are always considered to be representative of the region concerned.

In previous reports representativeness was assessed using the criteria developed by Gibbons *et al.* (1993). Data from the 1988–91 Breeding Atlas were used to compare the average abundance of a given species in 10-km squares with and without CBC plots. If average abundance is higher in squares without CBC plots, it is likely that much of the population is not well sampled by the CBC. In past reports, CBC data for such species were labelled as "unrepresentative". Where there are insufficient data to undertake such calculations, expert opinion was used instead.

Sample size

Sample size is assessed from the average number of plots contributing to the population indices for a given species in each year. A plot with a zero count would be included provided that the species had been recorded there in at least one year and that records for that plot were available for at least two years. Plots where a species has never been recorded do not enter the index calculations. These average sample sizes are shown in column four ('plots') of the population change tables. For CBC, WBS and CES, a mean of between 10 and 19 plots (when rounded to a whole number) is flagged as a small sample. For BBS indices for individual countries a mean in the range 30–39 plots is flagged as a small sample. UK BBS indices are presented only where samples reach at least 40 plots.

Statistical methods for alerts

The alert system page contains a general overview of how the alert system works. More detailed information is given below about the statistical methods used to estimate population indices, population changes and their confidence intervals.

General structure of the data

The data for all of the schemes reported here consist of annual counts made over a period of years at a series of sites. They can thus be summarised as a data matrix of sites x years, within which a proportion of the cells contain missing values because not all of the sites are covered every year. Such data can be represented as a simple model:

log (count) = site effect + year effect

Each site has a single site-effect parameter. These site parameters are not usually of biological interest but they are important because abundance is likely to differ between sites. The main parameters of interest are the year effects. These can be modelled either with the same number of parameters as years (an annual model), or with a smaller number of parameters, representing a smoothed curve.

A simple annual model would be fitted as a generalised linear model with Poisson errors and a log link function. This is the main model provided by the program TRIM (Pannekoek & van Strien 1996), which is widely used for population monitoring.

Fitting smoothed trends

Our preferred method for generating a smoothed population trend is to fit a smoothed curve to the data directly using a generalised additive model (GAM) (Hastie & Tibshirani 1990, Fewster *et al.* 2000). Thus the model from the previous section becomes:

log (count) = site effect + smooth (year)

where smooth (year) represents some smoothing function of the year effect. It was not straightforward to fit GAMs to the bird census data and we have therefore fitted smoothed curves with a similar degree of smoothing to the annual indices (details below).

The non-parametric smoothed curve fitted in our models is based on a smoothing spline. The degree of smoothing is specified by the number of degrees of freedom (df). A simple linear trend has df = 1, whereas the full annual model has df = t-1, where t is the number of years in the time series. Here we set df to be approximately 0.3 times the number of years in the time series (Fewster *et al.* 2000). The degrees of freedom used for the main data sets presented in this report are summarised below.

	Years	Length of time series	df for smoothed index
CBC/BBS	1966–2011	46	15
WBS/WBBS	1974–2011	38	12
Breeding Bird Survey	1994–2011	18	6
Heronries Census	1928–2011	84	28
Constant Effort Sites	1983–2011	29	9

Note that the numbers of years shown here are different from those available for calculating change measures, because we use the whole time series available for analysis (i.e. prior to the truncation of end points), and because we count the number of years in the time series rather than the number of annual change measures.

CBC/BBS, WBS/WBBS and BBS trends

The model fitted to the combined CBC/BBS and WBS/WBBS data is that historically employed for the BBS – a generalised linear model with counts assumed to follow a Poisson distribution and a logarithmic link function. Standard errors were calculated via a bootstrapping procedure involving 199 replications. For presentation in the figures, both the population trend and its confidence limits were also subsequently smoothed using a thin-plate smoothing spline. The overall result is a smoothed trend that is mathematically equivalent to that produced from a generalised additive model.

Heronries Census trends

The Heronries Census data were analysed using a modified sites x years model based on ratio estimation which incorporates information about new colonies (sites) that have been established and other colonies from the sample that are known to have become extinct. The method was developed by Thomas (1993) specifically in relation to the heronries data set. Since then the heronries database has been substantially upgraded and the method has been applied to the full data set (Marchant et al. 2004).

The above method of analysis cannot be easily applied within a GAM framework. Therefore we fitted a smooth curve to the annual indices. This was done using PROC TSPLINE of SAS (SAS 2009). This procedure should give very similar estimates to a GAM analysis but it does not provide confidence intervals for the smoothed population trend or the change measures derived from it. This is not a serious limitation as there are presently no alerts for Grey Heron.

Constant Effort Sites trends

GAMs were fitted to the CES data for catches of adults and juveniles separately with the addition of an offset to correct for missing visits. Confidence limits were fitted using a bootstrap technique to avoid restrictive assumptions about the distribution of the data. Bootstrap samples were drawn from the data by sampling plots with replacement. We generated 199 bootstrap samples from each data set and fitted a GAM to each of them. Confidence limits for the smoothed population indices (85% cl) and change measures (90% cl) were determined by taking the appropriate percentiles from the distributions of the bootstrap estimates, in a similar manner to that employed for the WBS/WBBS trends.

Species

Access the page for a species by clicking its link on the list below. Each species page has alphabetical and taxonomic listings giving access to all the others.

Jump to

Wildfowl
Gamebirds
Seabirds
Waterbirds

Raptors
Waders
Pigeons
Owls

Crows
Tits
Larks
Warblers

Thrushes
Sparrows
Finches
Buntings

List of species (in BOU taxonomic order)

WILDFOWL
Mute Swan
Greylag Goose
Canada Goose
Shelduck
Mallard
Tufted Duck
Goosander
GAMEBIRDS
Red Grouse
Red-legged Partridge
Grey Partridge
Pheasant
WATERBIRDS
Red-throated Diver
Cormorant
Grey Heron
Little Grebe
Great Crested Grebe
RAPTORS, etc
Red Kite
Hen Harrier
Sparrowhawk
Buzzard
Kestrel
Merlin
Hobby
Peregrine
Moorhen
Coot
WADERS
Oystercatcher
Golden Plover
Lapwing
Ringed Plover
Curlew
Common Sandpiper
Redshank
Woodcock
Snipe
PIGEONS, etc
Feral Pigeon
Stock Dove
Woodpigeon

Collared Dove
Turtle Dove
Ring-necked Parakeet
Cuckoo

OWLS, etc
Barn Owl
Little Owl
Tawny Owl
Nightjar
Swift
Kingfisher
Green Woodpecker
Great Spotted Woodpecker
Lesser Spotted Woodpecker
CROWS, etc
Magpie
Jay
Jackdaw
Rook
Carrion Crow
Hooded Crow
Raven
TITS, etc
Goldcrest
Blue Tit
Great Tit
Coal Tit
Willow Tit
Marsh Tit
LARKS, etc
Woodlark
Skylark
Sand Martin
Swallow
House Martin
WARBLERS, etc
Cetti's Warbler
Long-tailed Tit
Wood Warbler
Chiffchaff
Willow Warbler
Blackcap
Garden Warbler
Lesser Whitethroat

Whitethroat
Grasshopper Warbler
Sedge Warbler
Reed Warbler
Nuthatch
Treecreeper
Wren
Starling
Dipper
THRUSHES, etc
Ring Ouzel
Blackbird
Song Thrush
Mistle Thrush
Spotted Flycatcher
Robin
Nightingale
Pied Flycatcher
Redstart
Whinchat
Stonechat
Wheatear
SPARROWS, etc
Dunnock
House Sparrow
Tree Sparrow
Yellow Wagtail
Grey Wagtail
Pied Wagtail
Tree Pipit
Meadow Pipit
FINCHES
Chaffinch
Greenfinch
Goldfinch
Siskin
Linnet
Lesser Redpoll
Common Crossbill
Bullfinch

BUNTINGS
Yellowhammer
Reed Bunting
Corn Bunting

Information to aid interpretation of the pages for individual species can be found on the Key to species texts page.

The following seabird species are not covered by *BirdTrends* but full trend information is available from the*JNCC 2012), a separate web site produced by a partnership of which both BTO and JNCC are a part.*

SEABIRDS

Fulmar
Manx Shearwater
Storm Petrel
Leach's Petrel
Gannet
Shag
Arctic Skua
Great Skua

Kittiwake

Black-headed Gull
Mediterranean Gull
Common Gull
Lesser Black-backed Gull
Herring Gull
Great Black-backed Gull
Sandwich Tern

Common Tern
Roseate Tern
Arctic Tern
Little Tern
Guillemot
Razorbill
Black Guillemot
Puffin

Key to species texts

The 117 species in this report can be accessed in any order, via alphabetic and taxonomic lists. The taxonomic sequence is that established by the British Ornithologists' Union and updated in in its current British List. The vernacular and scientific names we use are also drawn from that list. Given this report's limited geographical scope, we use the British rather than the international English names. Depending on the availability of data, the following will be found beneath each species heading:

1. Conservation listings: First, the European conservation category is given, according to current listings by BirdLife International in Birds in Europe (BirdLife International 2004). These update the original listings of Tucker & Heath (1994). For SPECs (Species of European Conservation Concern), the European Threat Status is also given. The current SPEC categories are as follows:
   - SPEC 1
     Species of global conservation concern, according to the latest assessments by BirdLife International (www.birdlife.org/datazone/species/index.html)
   - SPEC 2
     Species with an unfavourable European conservation status, and with more than half of the global breeding or wintering population concentrated in Europe
   - SPEC 3
     Species with an unfavourable European conservation status, but with less than half of the global breeding or wintering population within Europe

   Other species, not considered to be of European conservation concern, and assessed as 'secure', have no SPEC category but are placed into two further groupings:

   - Species with a favourable European conservation status, and with less than half of the breeding or wintering population within Europe (Non-SPEC)
   - Species with a favourable European conservation status, but with more than half of the global breeding or wintering population concentrated in Europe (Non-SPEC^{E})

   The UK conservation listing, given next, is taken from The Population Status of Birds in the UK (Eaton *et al.* 2009 (BoCC3); see PSoB pages). These assessments supersede two earlier Birds of Conservation Concern listings (Gibbons *et al.* 1996, Gregory *et al.* 2002). There are three categories, as follows:

   - Red – high conservation concern
   - Amber– medium conservation concern
   - Green– all other species (except introduced species, which are not classified)

   The main reason or reasons for listing as red or amber are also given. NB:

   - SPEC 1 (globally threatened) species are automatically red listed, and SPEC 1(near threatened), SPEC 2 or SPEC 3 species are amber listed (unless they are introduced or a red-list criterion applies)
   - Red or amber listing may stem from decline, localisation or international importance of non-breeding as well as breeding populations in the UK
   - Rates of population decline used to assess red and amber listing are generally derived from CBC/BBS results for the 25-year period 1981–2006 or for 1969–2006, and do not take more recent changes into account
   - Range declines are generally calculated from the numbers of 10-km squares occupied in the 1968–72 and 1988–91 national breeding atlases (Gibbons *et al.* 1993) but make use of more recent material where available
   - Historical decline (in UK over the period 1800–1995) is assessed by literature review

   For the first time, BoCC3 has undertaken to classify races, for polytypic species, where two or more races occur regularly in the UK. On occasion the listing for a race may differ from that for the species as a whole. These race-level assessments are given alongside those for species level in our species pages although, since our report is mainly about breeding birds in UK, we have omitted races that occur only as migrants or winter visitors.

   Following the signing of the Convention on Biological Diversity at the 'Earth Summit' in Rio de Janeiro in 1992, the statutory conservation bodies in the UK compiled Biodiversity Action Plans (BAPs) for 26 rare or threatened bird species, of which 12 are covered by this report. A BAP review published in 2007 has concluded that 56 UK bird species now qualify for BAPs and has recommended that certain subspecies (e.g. Fair Isle and St Kilda Wrens) should now be included as BAP priorities. Our report covers 31 of those species.

   Where a UK BAP exists, we give the link to the latest available version. For 'priority species', you will find an onward link to the relevant JNCC priority species page. A note appears in this section if the species is one for which the Rare Breeding Birds Panel requires all breeding records to be submitted.

2. Long-term trend: This summarises the trend in population size since 1967 from CBC/BBS,1975 from WBS/WBBS data, or 1984 from CES data. If there are no data available from these schemes, any assessment of trends covers the period since about the mid 1960s, but may also take historical data into account. Increases and declines that are described as 'shallow', 'moderate' or 'rapid' are generally statistically significant. The following terms are used:
   - Rapid decline: >50% population decline according to CBC/BBS, WBS/WBBS or CES
   - Moderate decline: 25–50% population decline according to CBC/BBS, WBS/WBBS or CES
   - Shallow decline: 10–25% population decline according to CBC/BBS, WBS/WBBS or CES
   - Decline/Increase: information has been derived from sources other than CBC/BBS, WBS/WBBS or CES
   - Probable/Possible increase/decline: information has been derived from sources other than CBC/BBS, WBS/WBBS or CES, and the information is uncertain – see the status summary for details
   - Stable/Fluctuating, with no long-term trend: no overall change, or change <10%
   - Uncertain: the information from two monitoring schemes conflicts, or the data are unrepresentative of the species' total UK population – see the status summary for details

- Unknown: no information on the UK population trend is available
- Shallow increase: 10–50% population increase according to CBC/BBS, WBS/WBBS or CES
- Moderate increase: 50–100% population increase according to CBC/BBS, WBS/WBBS or CES
- Rapid increase: >100% population increase according to CBC/BBS, WBS/WBBS or CES

3. UK population size: Periodic reports on population sizes of birds in Britain and in the UK, for the breeding season and for winter, are agreed by the Avian Population Estimates Panel (APEP), on which BTO, GWCT, JNCC, RSPB and WWT are represented. UK population estimates from the Panel's third report (Musgrove *et al.* 2013) are given for each of our species, with a shortened reference (APEP13) and a summary of how each was derived. In a handful of cases, new information potentially superseding APEP13 is also presented.
4. Key facts table: For 43 species only, there follows a table giving a summary of key facts for migration, habitat and diet.
5. Status summary: This section provides a brief summary of the trends detailed for the species. Unless there is a separate Causes of change section for the species (see 10, below), it also indicates why such changes might have occurred, if this is known, with reference to any published information.
6. Population trend graphs: The first, large graph shows the most representative long-term trend in abundance for the species, and is followed under the 'Population changes in detail' header by further graphs from other schemes, including BBS graphs for separate UK countries, as available.
   The Methods section provides details about how the trend data are calculated for each scheme. For BBS, CBC/BBS, CBC, WBS/WBBS and CES, the graphs show a smoothed line (in blue) and its 85% confidence limits (in green); for the Heronries Census, annual estimates are shown in blue, 85% confidence limits in green, and a smoothed trend in red.
7. Population trends table: This table provides details of summarised percentage changes in population size, over the maximum period from each source, and from the past 25 years, 10 years and 5 years, where these figures are available. Further columns indicate the years included, the average number of census plots included in the analysis for each year, the percentage change (an increase if presented with no sign) and the upper and lower 90% confidence limits of that change. Where the confidence interval does not include zero change, population declines are regarded as statistically significant. The 'Alert' column indicates where a statistically significant population decline is estimated to be of 50% or more (>50) or between 25% and 50% (>25) (see the Alerts section for further details). The 'Comment' column lists any caveats that must be considered when interpreting the estimates. The caveats include:
   - Small sample: For CBC/BBS, WBS/WBBS and CES data, a mean sample size of less than 20 (but more than 10) census plots was available; for BBS data from individual countries, a mean sample of less than 40 (but more than 30) plots was available.
   - Unrepresentative?: Some trends may be marked as possibly unrepresentative of the stated region, owing to the original CBC plots being self-selected by observers and thus potentially a biased sample. This judgment was made either because the species' average abundance in 10-km squares containing CBC plots was less than that in other occupied 10-km squares, as measured by 1988–91 Breeding Atlas timed counts or frequency indices (Gibbons *et al.* 1993) or, where these figures could not be calculated, on expert opinion.

8. Demographic graphs: Graphs from Constant Effort Sites Scheme or Nest Record Scheme data illustrate trends in productivity. For NRS data, annual means (averages) are shown in green, with error bars to denote ±1 standard error; quadratic or linear regression lines (in black). The upper and lower 95% confidence limits of these lines (in blue) are also shown. For CES data, the smoothed trends are plotted (in blue) with their 85% confidence limits (in green) (see CES section for details). CES survival graphs, where available, also appear in this section. For these, annual estimates are shown, ±1 standard error, but trends have not been assessed.
9. Demography table: This provides details of changes in demographic variables since 1968 (or a more recent year, depending on the availability of data). It lists the period of years concerned, the mean annual sample, the type of trend ('curvilinear' is for a significant quadradic trend, 'linear' is for a significant linear trend, 'none' is where the linear trend is not significantly different from horizontal), the modelled values (from the appropriate regression) for the first and last years and their difference (provided only where the trend is significant), and any caveats that must be considered when interpreting the data. Changes are presented either in the units given or as percentages, and are increases unless a minus sign is shown. The caveat 'Small sample' is given when the mean number of nest record cards contributing annually was in the range 10–30, or when the mean annual number of CES plots recording the species was less than 20 (but more than 10).
10. Causes of change: For a selection of species (currently 43), information on the causes of the demographic changes we have observed has been removed from the Status summary paragraph and expanded under this heading. Literature references, whether or not they are hyperlinked, are to be found in the main References section of the report.
11. Additional information: Links to atlas maps and tables from previous atlas surveys, and the relevant pages of BirdFacts, BirdTrack and Garden BirdWatch, as available, from the BTO web site are provided on the side bar of each species page.

Summary tables

Tables of alerts and population increases from CBC/BBS
1a. CBC/BBS UK alerts – long term
1b. CBC/BBS England alerts – long term
2a. CBC/BBS UK alerts – 25 years
2b. CBC/BBS England alerts – 25 years
3a. CBC/BBS UK alerts – 10 years
3b. CBC/BBS England alerts – 10 years
4a. CBC/BBS UK alerts – 5 years
4b. CBC/BBS England alerts – 5 years
5a. CBC/BBS UK population increases of >50% – long term
5b. CBC/BBS England population increases of >50% – long term

Tables of alerts and population increases from WBS/WBBS
1. WBS/WBBS alerts – long term
2. WBS/WBBS alerts – 25 years
3. WBS/WBBS alerts – 10 years
4. WBS/WBBS alerts – 5 years
5. WBS/WBBS population increases of >50% – long term

Tables of alerts and population increases from CES
1. CES adults alerts – long term
2. CES adults alerts – 10 years
3. CES adults alerts – 5 years
4. CES adults population increases of >50% – long term

Tables of population declines and increases from BBS
1. BBS – UK alerts – long term
2. BBS – England alerts – long term
3. BBS – Scotland alerts – long term
4. BBS – Wales alerts – long term
5. BBS – Northern Ireland alerts – long term
6. BBS – UK alerts – 10 years
7. BBS – England alerts – 10 years
8. BBS – Scotland alerts – 10 years
9. BBS – Wales alerts – 10 years
10. BBS – Northern Ireland alerts – 10 years
11. BBS – UK alert – 5 years
12. BBS – England alerts – 5 years
13. BBS – Scotland alerts – 5 years
14. BBS – Wales alerts – 5 years
15. BBS – Northern Ireland alerts – 5 years
16. BBS – UK population increases of >50%
17. BBS – England population increases of >50%
18. BBS – Scotland population increases of >50%
19. BBS – Wales population increases of >50%
20. BBS – Northern Ireland population increases of >50%

Tables of breeding performance
1. Clutch size
2. Brood size
3. Egg-stage nest failure rate

CBC/BBS alerts & population increases

1a. Table of population alerts for CBC/BBS UK 1967-2010

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Turtle Dove	43	107	-93	-95	-89	>50	
Grey Partridge	43	130	-91	-94	-86	>50	
Willow Tit	43	43	-91	-96	-85	>50	
Spotted Flycatcher	43	127	-89	-93	-85	>50	
Corn Bunting	43	72	-88	-94	-80	>50	
Yellow Wagtail	43	78	-76	-88	-53	>50	
Marsh Tit	43	97	-72	-81	-63	>50	
Little Owl	43	59	-61	-76	-42	>50	
Mistle Thrush	43	538	-56	-63	-46	>50	
Yellowhammer	43	532	-56	-64	-46	>50	
Whitethroat	43	565	-55	-68	-38	>50	
Song Thrush	43	861	-54	-61	-45	>50	
Lapwing	43	292	-45	-68	-18	>25	
Bullfinch	43	316	-39	-51	-22	>25	
Dunnock	43	887	-34	-41	-22	>25	

1b. Table of population alerts for CBC/BBS England 1967-2010

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Tree Sparrow	43	91	-96	-98	-91	>50	
Turtle Dove	43	106	-93	-95	-88	>50	
Grey Partridge	43	116	-91	-94	-86	>50	
Spotted Flycatcher	43	96	-91	-95	-87	>50	
Willow Tit	43	40	-90	-95	-83	>50	
Starling	43	607	-88	-91	-84	>50	
Tree Pipit	43	48	-86	-94	-74	>50	
Lesser Redpoll	43	47	-86	-95	-64	>50	
Corn Bunting	43	68	-86	-93	-73	>50	
Yellow Wagtail	43	77	-75	-89	-47	>50	
Linnet	43	433	-74	-80	-66	>50	
Cuckoo	43	286	-73	-80	-62	>50	
Marsh Tit	43	89	-71	-81	-60	>50	
Skylark	43	579	-64	-69	-56	>50	
Yellowhammer	43	464	-60	-68	-49	>50	

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Mistle Thrush	43	437	-59	-66	-47	>50	
Willow Warbler	43	465	-58	-68	-42	>50	
Whitethroat	43	489	-56	-68	-38	>50	
Little Owl	43	57	-55	-71	-30	>50	
Song Thrush	43	683	-54	-61	-44	>50	
Meadow Pipit	43	183	-49	-74	-22	>25	
Bullfinch	43	255	-43	-56	-28	>25	
Dunnock	43	732	-37	-46	-27	>25	

2a. Table of population alerts for CBC/BBS UK 1985-2010

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Turtle Dove	25	131	-88	-92	-84	>50	
Willow Tit	25	46	-88	-93	-83	>50	
Spotted Flycatcher	25	157	-81	-88	-75	>50	
Grey Partridge	25	170	-79	-84	-71	>50	
Corn Bunting	25	101	-72	-86	-55	>50	
Yellow Wagtail	25	111	-71	-83	-59	>50	
Little Owl	25	82	-65	-75	-51	>50	
Lapwing	25	457	-57	-66	-45	>50	
Yellowhammer	25	807	-52	-58	-46	>50	
Mistle Thrush	25	814	-44	-50	-36	>25	
Marsh Tit	25	124	-42	-57	-27	>25	
Tawny Owl	25	93	-34	-50	-18	>25	

2b. Table of population alerts for CBC/BBS England 1985-2010

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Lesser Redpoll	25	46	-91	-96	-82	>50	
Turtle Dove	25	129	-88	-92	-84	>50	
Willow Tit	25	41	-88	-93	-81	>50	
Tree Pipit	25	57	-87	-93	-77	>50	
Spotted Flycatcher	25	115	-84	-89	-77	>50	
Starling	25	958	-80	-84	-77	>50	
Grey Partridge	25	152	-78	-82	-71	>50	
Cuckoo	25	420	-72	-76	-68	>50	
Tree Sparrow	25	97	-72	-87	-52	>50	
Corn Bunting	25	97	-70	-84	-50	>50	
Yellow Wagtail	25	108	-69	-81	-54	>50	
Little Owl	25	79	-59	-71	-48	>50	
Willow Warbler	25	680	-59	-65	-52	>50	
Yellowhammer	25	704	-57	-63	-51	>50	
Lapwing	25	381	-49	-61	-34	>25	
Mistle Thrush	25	656	-49	-55	-41	>25	
House Sparrow	25	841	-46	-58	-27	>25	
Marsh Tit	25	113	-41	-53	-23	>25	

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Skylark	25	912	-37	-44	-29	>25	
Meadow Pipit	25	286	-30	-44	-11	>25	

3a. Table of population alerts for CBC/BBS UK 2000-2010

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Turtle Dove	10	148	-73	-77	-67	>50	
Willow Tit	10	47	-63	-73	-54	>50	
Little Owl	10	110	-46	-55	-36	>25	
Spotted Flycatcher	10	197	-39	-54	-23	>25	
Grey Partridge	10	227	-35	-46	-26	>25	
Yellow Wagtail	10	153	-35	-44	-21	>25	
Mistle Thrush	10	1288	-33	-37	-28	>25	
Tawny Owl	10	98	-25	-38	-8	>25	
Marsh Tit	10	163	-25	-38	-13	>25	
Greenfinch	10	2033	-25	-29	-22	>25	

3b. Table of population alerts for CBC/BBS England 2000-2010

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Turtle Dove	10	146	-73	-77	-67	>50	
Willow Tit	10	42	-62	-71	-51	>50	
Spotted Flycatcher	10	139	-48	-57	-38	>25	
Cuckoo	10	547	-47	-52	-43	>25	
Starling	10	1534	-46	-49	-42	>25	
Little Owl	10	107	-45	-53	-34	>25	
Mistle Thrush	10	1016	-35	-39	-31	>25	
Yellow Wagtail	10	149	-34	-43	-19	>25	
Tree Pipit	10	78	-33	-49	-13	>25	
Grey Partridge	10	205	-29	-38	-18	>25	
Greenfinch	10	1704	-25	-28	-21	>25	

4a. Table of population alerts for CBC/BBS UK 2005-2010

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Turtle Dove	5	131	-58	-63	-51	>50	
Willow Tit	5	49	-45	-56	-32	>25	
Greenfinch	5	2291	-32	-34	-29	>25	
Little Owl	5	113	-31	-40	-17	>25	
Grey Partridge	5	243	-30	-38	-20	>25	
Spotted Flycatcher	5	195	-28	-42	-11	>25	
Mistle Thrush	5	1392	-26	-30	-22	>25	

4b. Table of population alerts for CBC/BBS England 2005-2010

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Turtle Dove	5	129	-59	-64	-51	>50	
Willow Tit	5	45	-40	-53	-23	>25	
Spotted Flycatcher	5	136	-33	-45	-22	>25	
Greenfinch	5	1926	-33	-34	-30	>25	
Cuckoo	5	560	-31	-35	-27	>25	
Little Owl	5	110	-31	-41	-17	>25	
Starling	5	1684	-30	-33	-26	>25	
Grey Partridge	5	221	-29	-37	-20	>25	

5a. Table of population increases of >50% for UK CBC/BBS 1967-2010

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Pied Wagtail	43	518	53	9	121		
Wren	43	1040	57	40	75		
Chiffchaff	43	609	69	39	112		
Coal Tit	43	371	76	3	179		
Magpie	43	791	101	61	151		
Great Tit	43	933	112	85	147		
Jackdaw	43	656	114	49	264		
Reed Warbler	43	63	116	40	377		
Mallard	43	546	168	100	223		
Woodpigeon	43	958	169	46	509		
Coot	43	119	188	87	559		
Blackcap	43	661	224	175	312		
Mute Swan	43	103	233	49	617		
Nuthatch	43	215	235	146	360		
Great Spotted Woodpecker	43	439	408	247	657		
Collared Dove	43	535	2074	722	10692		

5b. Table of population increases of >50% for England CBC/BBS 1967-2010

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Pied Wagtail	43	399	52	6	133		
Wren	43	827	65	41	88		
Chiffchaff	43	520	73	40	124		
Goldfinch	43	519	74	38	134		
Reed Warbler	43	60	91	33	220		
Pheasant	43	625	92	53	173		
Great Tit	43	767	101	76	137		
Jackdaw	43	525	101	29	216		
Magpie	43	670	105	59	157		

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Carrion Crow	43	799	119	78	177		Includes Hooded Crow
Long-tailed Tit	43	385	121	69	213		
Stock Dove	43	308	180	90	347		
Coot	43	108	181	72	482		
Woodpigeon	43	770	189	47	511		
Mute Swan	43	89	197	27	535		
Blackcap	43	575	197	142	292		
Green Woodpecker	43	326	199	121	354		
Mallard	43	461	204	132	283		
Nuthatch	43	185	244	148	381		
Great Spotted Woodpecker	43	389	369	257	659		
Buzzard	43	216	670	413	1736		

WBS/WBBS alerts & population increases

1. Table of alerts for WBS/WBBS waterways 1975-2010

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Yellow Wagtail	35	24	-94	-98	-87	>50	
Snipe	35	13	-93	-99	-73	>50	Small sample
Pied Wagtail	35	112	-68	-76	-61	>50	
Redshank	35	24	-62	-88	-24	>50	
Reed Bunting	35	84	-58	-69	-41	>50	
Grey Wagtail	35	96	-49	-61	-35	>25	
Common Sandpiper	35	47	-41	-58	-27	>25	
Dipper	35	63	-30	-45	-11	>25	
Sedge Warbler	35	69	-30	-50	-5	>25	
Moorhen	35	122	-26	-42	-7	>25	

2. Table of alerts for WBS/WBBS waterways 1985-2010

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Snipe	25	15	-92	-98	-78	>50	Small sample
Yellow Wagtail	25	23	-92	-97	-85	>50	
Lapwing	25	74	-62	-75	-39	>50	
Redshank	25	26	-61	-80	-35	>50	
Common Sandpiper	25	56	-46	-57	-37	>25	
Pied Wagtail	25	130	-45	-53	-32	>25	
Curlew	25	50	-32	-57	-2	>25	

3. Table of alerts for WBS/WBBS waterways 2000-2010

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Yellow Wagtail	10	25	-47	-72	-1	>25	
Curlew	10	78	-46	-58	-32	>25	
Lapwing	10	111	-37	-49	-25	>25	
Redshank	10	32	-37	-52	-7	>25	
Pied Wagtail	10	200	-32	-38	-23	>25	
Grey Wagtail	10	174	-26	-37	-14	>25	

4. Table of alerts for WBS/WBBS waterways 2005-2010

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Grey Wagtail	5	172	-32	-39	-25	>25	
Lapwing	5	110	-26	-36	-19	>25	
Pied Wagtail	5	200	-26	-31	-17	>25	

5. Table of population increases for WBS/WBBS waterways 1975-2010

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Oystercatcher	35	46	70	32	175		
Coot	35	60	83	20	228		
Mute Swan	35	78	86	35	172		
Whitethroat	35	79	161	22	357		
Mallard	35	161	219	140	302		

CES alerts & population increases

1. Table of alerts for CES adults 1984-2010

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Reed Bunting	26	58	-66	-75	-53	>50	
Willow Warbler	26	89	-65	-73	-56	>50	
Lesser Whitethroat	26	38	-63	-79	-43	>50	
Willow Tit	26	18	-51	-86	-10	>50	Small sample
Sedge Warbler	26	65	-39	-56	-21	>25	
Song Thrush	26	82	-30	-44	-15	>25	
Reed Warbler	26	55	-30	-44	-12	>25	

2. Table of alerts for CES adults 2000-2010

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Greenfinch	10	49	-33	-51	-16	>25	
Sedge Warbler	10	72	-29	-38	-22	>25	
Willow Warbler	10	88	-28	-37	-17	>25	
Reed Bunting	10	64	-27	-37	-7	>25	

3. Table of alerts for CES adults 2005-2010

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Greenfinch	5	49	-37	-50	-28	>25	
Reed Bunting	5	65	-34	-42	-22	>25	

4. Table of population increases for CES adults 1984-2010

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Blackcap	26	90	78	49	112		
Chiffchaff	26	72	211	108	376		

BBS population declines & increases

1. Table of declines >25% for BBS UK 1995-2010

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Turtle Dove	15	165	-80	-83	-76	>50	
Willow Tit	15	51	-79	-86	-71	>50	
Wood Warbler	15	53	-65	-76	-49	>50	
Whinchat	15	77	-57	-69	-42	>50	
Grey Partridge	15	226	-55	-63	-47	>50	
Yellow Wagtail	15	156	-50	-59	-40	>50	
Spotted Flycatcher	15	197	-50	-62	-36	>25	
Pied Flycatcher	15	40	-50	-65	-32	>50	
Starling	15	1741	-50	-53	-45	>25	
Cuckoo	15	726	-49	-53	-44	>25	
Curlew	15	511	-44	-50	-38	>25	
Little Owl	15	101	-40	-51	-28	>25	
Redshank	15	86	-39	-51	-21	>25	
Swift	15	1024	-38	-45	-30	>25	
Dipper	15	59	-36	-56	-10	>25	
Corn Bunting	15	142	-34	-46	-21	>25	
Kingfisher	15	55	-33	-48	-8	>25	
Kestrel	15	645	-32	-39	-25	>25	
Lapwing	15	665	-32	-38	-23	>25	
Peregrine	15	41	-31	-53	-6	>25	
Mistle Thrush	15	1177	-28	-34	-21	>25	

2. Table of declines >25% for BBS England 1995-2010

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Turtle Dove	15	162	-81	-84	-76	>50	
Willow Tit	15	45	-78	-84	-71	>50	
Cuckoo	15	565	-63	-66	-61	>50	

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Spotted Flycatcher	15	138	-55	-64	-44	>50	
Starling	15	1427	-55	-58	-51	>50	
Grey Partridge	15	201	-52	-58	-42	>50	
Yellow Wagtail	15	152	-50	-59	-40	>50	
Nightingale	15	30	-49	-60	-25	>25	
Whinchat	15	33	-47	-68	-21	>25	
Tree Pipit	15	74	-46	-63	-26	>25	
Little Owl	15	98	-38	-48	-24	>25	
Swift	15	884	-38	-46	-30	>25	
Mistle Thrush	15	921	-35	-39	-30	>25	
Redshank	15	60	-33	-51	-13	>25	
Curlew	15	326	-31	-38	-25	>25	
Corn Bunting	15	136	-31	-45	-18	>25	
Willow Warbler	15	907	-28	-33	-22	>25	
Linnet	15	943	-27	-33	-22	>25	

3. Table of declines >25% for BBS Scotland 1995-2010

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Kestrel	15	42	-64	-76	-44	>50	
Curlew	15	121	-55	-64	-47	>50	
Lapwing	15	88	-48	-60	-35	>25	
Swift	15	50	-39	-61	-15	>25	
Starling	15	145	-37	-50	-23	>25	
Rook	15	109	-35	-48	-17	>25	
Meadow Pipit	15	200	-32	-40	-24	>25	
Oystercatcher	15	127	-29	-37	-18	>25	

4. Table of declines >25% for BBS Wales 1995-2010

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Starling	15	81	-67	-76	-55	>50	
Swift	15	67	-57	-68	-41	>50	
Curlew	15	36	-54	-65	-41	>50	
Goldcrest	15	80	-51	-67	-28	>50	
Yellowhammer	15	36	-40	-56	-21	>25	
Cuckoo	15	56	-34	-49	-18	>25	
Linnet	15	92	-30	-48	-9	>25	

5. Table of declines >25% for BBS Northern Ireland 1995-2010

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Skylark	15	34	-43	-55	-34	>25	

6. Table of declines >25% for BBS UK 2000-2010

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Turtle Dove	10	146	-73	-76	-68	>50	
Willow Tit	10	46	-64	-74	-52	>50	
Little Owl	10	106	-45	-54	-34	>25	
Whinchat	10	72	-44	-57	-30	>25	
Starling	10	1853	-44	-48	-40	>25	
Dipper	10	64	-41	-57	-21	>25	
Grey Wagtail	10	266	-39	-45	-29	>25	
Wood Warbler	10	50	-39	-62	-13	>25	
Spotted Flycatcher	10	194	-38	-53	-22	>25	
Grey Partridge	10	221	-37	-48	-28	>25	
Goldcrest	10	875	-37	-41	-27	>25	
Yellow Wagtail	10	151	-35	-44	-23	>25	
Curlew	10	543	-34	-40	-27	>25	
Kingfisher	10	61	-34	-57	-10	>25	
Stonechat	10	205	-34	-38	-12	>25	
Cuckoo	10	698	-33	-39	-28	>25	
Mistle Thrush	10	1279	-32	-37	-27	>25	
Swift	10	1102	-29	-35	-22	>25	
Redshank	10	95	-28	-42	-15	>25	
Marsh Tit	10	156	-27	-37	-15	>25	
Greenfinch	10	2001	-25	-28	-22	>25	

7. Table of declines >25% for BBS England 2000-2010

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Turtle Dove	10	143	-73	-77	-67	>50	
Willow Tit	10	41	-62	-71	-53	>50	
Nightingale	10	31	-46	-56	-24	>25	
Cuckoo	10	529	-45	-49	-40	>25	
Spotted Flycatcher	10	132	-45	-55	-36	>25	
Starling	10	1510	-45	-49	-42	>25	
Little Owl	10	103	-43	-52	-32	>25	
Redshank	10	69	-41	-57	-24	>25	
Whinchat	10	33	-39	-59	-24	>25	
Yellow Wagtail	10	147	-35	-45	-25	>25	
Mistle Thrush	10	985	-35	-38	-31	>25	
Grey Partridge	10	200	-30	-40	-20	>25	
Swift	10	947	-30	-38	-23	>25	
Tree Pipit	10	78	-30	-47	-14	>25	

8. Table of declines >25% for BBS Scotland 2000-2010

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Goldcrest	10	103	-51	-60	-37	>50	
Grey Wagtail	10	32	-50	-66	-31	>50	
Kestrel	10	41	-48	-66	-21	>25	
Stonechat	10	44	-43	-41	-1	>25	
Starling	10	155	-43	-51	-29	>25	
Curlew	10	115	-42	-54	-33	>25	
Mistle Thrush	10	87	-37	-51	-14	>25	
Rook	10	112	-37	-51	-18	>25	
Wren	10	245	-32	-34	-20	>25	
Lapwing	10	88	-31	-47	-12	>25	
Mallard	10	101	-30	-43	-16	>25	
Meadow Pipit	10	193	-28	-35	-22	>25	
Grey Heron	10	52	-27	-39	-10	>25	Non-breeders included

9. Table of declines >25% for BBS Wales 2000-2010

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Swift	10	73	-55	-68	-40	>50	
Starling	10	84	-51	-60	-43	>50	
Goldcrest	10	88	-50	-60	-36	>25	
Curlew	10	36	-43	-55	-27	>25	
Linnet	10	101	-40	-57	-26	>25	
Grey Heron	10	48	-32	-44	-17	>25	Non-breeders included
Treecreeper	10	43	-32	-51	-6	>25	
Tree Pipit	10	33	-31	-52	-1	>25	
Greenfinch	10	131	-27	-38	-14	>25	

10. Table of declines >25% for BBS Northern Ireland 2000-2010

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Skylark	10	36	-54	-66	-48	>50	
Goldcrest	10	52	-47	-48	-15	>25	
Greenfinch	10	62	-46	-58	-33	>25	
Meadow Pipit	10	75	-44	-51	-37	>25	
Rook	10	87	-43	-55	-28	>25	
Starling	10	92	-38	-51	-25	>25	
Mistle Thrush	10	70	-31	-45	-16	>25	
Wren	10	105	-26	-29	-12	>25	

11. Table of declines >25% for BBS UK 2005-2010

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Turtle Dove	5	129	-58	-63	-51	>50	
Stonechat	5	251	-57	-55	-43	>50	
Kingfisher	5	67	-43	-53	-29	>25	
Willow Tit	5	49	-43	-53	-28	>25	
Grey Wagtail	5	302	-42	-45	-32	>25	
Goldcrest	5	981	-36	-39	-27	>25	
Dipper	5	75	-33	-52	-12	>25	
Little Owl	5	110	-32	-41	-21	>25	
Starling	5	2018	-31	-36	-26	>25	
Greenfinch	5	2254	-31	-33	-28	>25	
Grey Partridge	5	237	-30	-37	-19	>25	
Whinchat	5	79	-30	-44	-15	>25	
Kestrel	5	801	-26	-31	-21	>25	
Mistle Thrush	5	1392	-26	-30	-22	>25	
Spotted Flycatcher	5	195	-26	-42	-10	>25	
Redshank	5	105	-25	-39	-11	>25	

12. Table of declines >25% for BBS England 2005-2010

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Turtle Dove	5	128	-59	-63	-51	>50	
Stonechat	5	121	-50	-55	-36	>50	
Willow Tit	5	44	-39	-54	-26	>25	
Kingfisher	5	61	-38	-45	-24	>25	
Little Owl	5	107	-31	-39	-19	>25	
Spotted Flycatcher	5	129	-31	-44	-20	>25	
Greenfinch	5	1901	-31	-33	-29	>25	
Starling	5	1653	-30	-33	-25	>25	
Grey Wagtail	5	206	-29	-35	-19	>25	
Grey Partridge	5	215	-28	-35	-19	>25	
Redshank	5	78	-28	-43	-12	>25	
Cuckoo	5	537	-28	-32	-24	>25	
Snipe	5	130	-25	-32	-13	>25	

13. Table of declines >25% for BBS Scotland 2005-2010

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Stonechat	5	54	-68	-62	-43	>50	
Goldcrest	5	122	-53	-60	-41	>50	
Grey Wagtail	5	34	-48	-64	-25	>25	
Kestrel	5	42	-46	-62	-20	>25	
Wren	5	287	-42	-42	-32	>25	
Mistle Thrush	5	103	-39	-50	-23	>25	
Starling	5	171	-35	-47	-20	>25	

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Rook	5	124	-30	-43	-15	>25	
Grey Heron	5	56	-27	-41	-8	>25	Non-breeders included

14. Table of declines >25% for BBS Wales 2005-2010

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Swift	5	73	-43	-55	-29	>25	
Starling	5	81	-37	-49	-27	>25	
Grey Heron	5	47	-33	-43	-21	>25	Non-breeders included
Stonechat	5	49	-31	-43	-14	>25	
Greenfinch	5	139	-30	-38	-21	>25	
Goldcrest	5	89	-27	-37	-11	>25	
Linnet	5	101	-27	-43	-16	>25	

15. Table of declines >25% for BBS Northern Ireland 2005-2010

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Greenfinch	5	68	-52	-58	-41	>50	
Meadow Pipit	5	77	-48	-51	-39	>25	
Goldcrest	5	61	-46	-47	-23	>25	
Mistle Thrush	5	73	-34	-42	-23	>25	
Skylark	5	35	-30	-40	-22	>25	
Starling	5	99	-29	-46	-10	>25	
Wren	5	113	-28	-28	-17	>25	

16. Table of population increases for BBS UK 1995-2010

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Siskin	15	162	55	16	86		
Grasshopper Warbler	15	76	59	22	107		
Sand Martin	15	124	60	3	148		
Crossbill	15	54	68	12	142		
Chiffchaff	15	1407	70	63	81		
Canada Goose	15	455	73	50	103		
Buzzard	15	885	75	60	91		
Nuthatch	15	453	80	63	96		
Gadwall	15	35	83	10	189		
Goldfinch	15	1506	91	80	102		
Tree Sparrow	15	166	96	56	158		
Blackcap	15	1498	102	94	117		
Great Spotted Woodpecker	15	1015	141	126	157		
Greylag Goose	15	169	168	42	374		
Barn Owl	15	45	390	263	619		
Red Kite	15	78	572	324	1157		

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Ring-necked Parakeet	15	55	1012	456	3538		

17. Table of population increases for BBS England 1995-2010

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Tree Sparrow	15	133	58	23	96		
Canada Goose	15	423	63	37	95		
Chiffchaff	15	1181	69	62	80		
Gadwall	15	33	79	7	197		
Nuthatch	15	382	82	64	102		
Goldfinch	15	1241	82	73	95		
Blackcap	15	1282	84	80	98		
Great Spotted Woodpecker	15	884	122	108	137		
Buzzard	15	575	153	124	185		
Greylag Goose	15	139	234	127	450		
Barn Owl	15	43	369	257	558		
Ring-necked Parakeet	15	55	1012	469	4355		
Red Kite	15	54	9598	4478	10864		

18. Table of population increases for BBS Scotland 1995-2010

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Siskin	15	73	52	10	98		
Dunnock	15	139	56	31	87		
Tree Pipit	15	32	72	20	118		
House Martin	15	61	104	43	168		
Whitethroat	15	76	121	64	191		
Goldfinch	15	85	133	59	208		
Blackcap	15	54	264	160	422		
Great Spotted Woodpecker	15	45	312	211	462		
Chiffchaff	15	44	336	189	633		

19. Table of population increases for BBS Wales 1995-2010

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Collared Dove	15	72	52	14	97		
Nuthatch	15	70	52	16	90		
Great Tit	15	169	60	37	83		
Goldfinch	15	125	71	37	119		
Stonechat	15	36	106	17	202		
House Sparrow	15	121	106	69	160		
Blackcap	15	118	114	85	161		
Great Spotted Woodpecker	15	74	192	129	268		

20. Table of population increases for BBS Northern Ireland 1995-2010

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Linnet	15	36	60	10	139		
Dunnock	15	69	68	14	106		
Coal Tit	15	62	78	23	116		
Woodpigeon	15	82	84	36	126		
Jackdaw	15	74	87	31	122		
Hooded Crow	15	80	108	55	152		
Willow Warbler	15	78	109	60	136		
Pheasant	15	39	159	49	245		
Great Tit	15	71	169	105	187		
Goldfinch	15	45	773	.	.		

Breeding performance

1. Table of significant trends in Clutch size measured between 1968-2010

Species	Period (yrs)	Mean annual sample	Trend	Predicted in first year	Predicted in last year	Change	Comment
Magpie	42	42	Linear decline	5.79 eggs	4.82 eggs	-0.97 eggs	
Long-tailed Tit	42	40	Curvilinear	7.75 eggs	7 eggs	-0.75 eggs	
Great Tit	42	311	Linear decline	8.1 eggs	7.42 eggs	-0.68 eggs	
Grey Heron	42	15	Linear decline	4.04 eggs	3.44 eggs	-0.6 eggs	Non-breeders include
Moorhen	42	97	Linear decline	6.44 eggs	6.04 eggs	-0.4 eggs	
Peregrine	42	18	Linear decline	3.52 eggs	3.12 eggs	-0.4 eggs	Small sample
Blue Tit	42	380	Curvilinear	9.49 eggs	9.13 eggs	-0.36 eggs	
Greenfinch	42	90	Linear decline	4.77 eggs	4.57 eggs	-0.2 eggs	
Golden Plover	42	12	Linear decline	3.99 eggs	3.83 eggs	-0.16 eggs	Small sample
Chaffinch	42	86	Curvilinear	4.23 eggs	4.07 eggs	-0.16 eggs	
Common Sandpiper	42	12	Linear decline	3.92 eggs	3.77 eggs	-0.15 eggs	Small sample
Pied Wagtail	42	61	Linear decline	5.09 eggs	4.95 eggs	-0.14 eggs	
Nightjar	42	19	Linear decline	1.99 eggs	1.86 eggs	-0.13 eggs	Small sample
Grey Wagtail	42	38	Curvilinear	4.74 eggs	4.66 eggs	-0.08 eggs	
Collared Dove	42	43	Linear decline	1.95 eggs	1.88 eggs	-0.07 eggs	
Buzzard	42	34	Curvilinear	2.19 eggs	2.15 eggs	-0.04 eggs	
Stock Dove	42	112	Curvilinear	2.07 eggs	2.09 eggs	0.02 eggs	
Yellowhammer	42	43	Curvilinear	3.35 eggs	3.37 eggs	0.02 eggs	
Carrion Crow	42	31	Curvilinear	4.04 eggs	4.09 eggs	0.05 eggs	Includes Hooded Crow
Redshank	42	29	Curvilinear	3.89 eggs	3.99 eggs	0.1 eggs	Small sample
Lapwing	42	127	Linear increase	3.7 eggs	3.81 eggs	0.11 eggs	
Mistle Thrush	42	33	Linear increase	3.9 eggs	4.04 eggs	0.14 eggs	
Dunnock	42	101	Curvilinear	3.89 eggs	4.1 eggs	0.21 eggs	
Little Owl	42	22	Linear increase	3.38 eggs	3.64 eggs	0.26 eggs	Small sample
Skylark	42	36	Linear increase	3.38 eggs	3.69 eggs	0.31 eggs	
Redstart	42	49	Curvilinear	5.91 eggs	6.24 eggs	0.33 eggs	
Pied Flycatcher	42	348	Linear increase	6.55 eggs	6.88 eggs	0.33 eggs	
Tree Sparrow	42	263	Curvilinear	4.76 eggs	5.16 eggs	0.4 eggs	
Starling	42	75	Linear increase	4.43 eggs	4.99 eggs	0.56 eggs	
Barn Owl	42	41	Curvilinear	4.25 eggs	4.83 eggs	0.58 eggs	

2. Table of significant trends in Brood size measured between 1968-2010

Species	Period (yrs)	Mean annual sample	Trend	Predicted in first year	Predicted in last year	Change	Comment
Great Tit	42	651	Linear decline	7.36 chicks	6.18 chicks	-1.18 chicks	
Sand Martin	42	50	Curvilinear	3.18 chicks	2.45 chicks	-0.73 chicks	
Blue Tit	42	732	Curvilinear	7.82 chicks	7.15 chicks	-0.67 chicks	
Magpie	42	74	Curvilinear	3.12 chicks	2.45 chicks	-0.67 chicks	
Coal Tit	42	75	Curvilinear	7.31 chicks	6.78 chicks	-0.53 chicks	
House Sparrow	42	143	Curvilinear	3.37 chicks	2.87 chicks	-0.5 chicks	
Yellow Wagtail	42	12	Linear decline	4.82 chicks	4.33 chicks	-0.49 chicks	Small sample
Carrion Crow	42	78	Curvilinear	2.89 chicks	2.4 chicks	-0.49 chicks	Includes Hooded Crow
Bullfinch	42	37	Curvilinear	4.12 chicks	3.68 chicks	-0.44 chicks	
Chiffchaff	42	42	Linear decline	5.11 chicks	4.69 chicks	-0.42 chicks	
Grey Heron	42	91	Curvilinear	2.73 chicks	2.32 chicks	-0.41 chicks	Non-breeders include
Long-tailed Tit	42	32	Curvilinear	6.65 chicks	6.26 chicks	-0.39 chicks	

Species	Period (yrs)	Mean annual sample	Trend	Predicted in first year	Predicted in last year	Change	Comment
Greenfinch	42	112	Linear decline	4.1 chicks	3.76 chicks	-0.34 chicks	
Raven	42	69	Linear decline	3.16 chicks	2.89 chicks	-0.27 chicks	
Rook	42	81	Curvilinear	2.21 chicks	2.01 chicks	-0.2 chicks	
Pied Wagtail	42	119	Linear decline	4.51 chicks	4.33 chicks	-0.18 chicks	
Turtle Dove	42	15	Curvilinear	1.82 chicks	1.69 chicks	-0.13 chicks	Small sample
Robin	42	204	Curvilinear	4.4 chicks	4.3 chicks	-0.1 chicks	
Jackdaw	42	111	Curvilinear	2.73 chicks	2.65 chicks	-0.08 chicks	
Blackbird	42	245	Curvilinear	3.33 chicks	3.27 chicks	-0.06 chicks	
Barn Owl	42	328	Curvilinear	2.96 chicks	2.92 chicks	-0.04 chicks	
Chaffinch	42	139	Curvilinear	3.6 chicks	3.56 chicks	-0.04 chicks	
Yellowhammer	42	66	Curvilinear	2.96 chicks	2.93 chicks	-0.03 chicks	
Wren	42	99	Curvilinear	4.72 chicks	4.69 chicks	-0.03 chicks	
Corn Bunting	42	14	Curvilinear	3.23 chicks	3.22 chicks	-0.01 chicks	Small sample
Linnet	42	124	Curvilinear	4.08 chicks	4.09 chicks	0.01 chicks	
Stock Dove	42	168	Curvilinear	1.82 chicks	1.83 chicks	0.01 chicks	
Grey Wagtail	42	80	Curvilinear	4.01 chicks	4.05 chicks	0.04 chicks	
Spotted Flycatcher	42	129	Curvilinear	3.63 chicks	3.67 chicks	0.04 chicks	
Swallow	42	789	Curvilinear	4.11 chicks	4.16 chicks	0.05 chicks	
Great Spotted Woodpecker	42	30	Curvilinear	3.72 chicks	3.78 chicks	0.06 chicks	Small sample
Dunnock	42	111	Curvilinear	3.4 chicks	3.46 chicks	0.06 chicks	
Kestrel	42	143	Curvilinear	3.77 chicks	3.84 chicks	0.07 chicks	
Buzzard	42	107	Curvilinear	1.88 chicks	1.95 chicks	0.07 chicks	
Stonechat	42	66	Curvilinear	4.65 chicks	4.75 chicks	0.1 chicks	
Mute Swan	42	67	Curvilinear	4.42 chicks	4.54 chicks	0.12 chicks	
Tree Pipit	42	29	Curvilinear	4.29 chicks	4.47 chicks	0.18 chicks	Small sample
Skylark	42	65	Curvilinear	3.11 chicks	3.32 chicks	0.21 chicks	
Willow Warbler	42	137	Linear increase	5.13 chicks	5.34 chicks	0.21 chicks	
Peregrine	42	45	Linear increase	2.37 chicks	2.59 chicks	0.22 chicks	
Sparrowhawk	42	69	Curvilinear	3.13 chicks	3.37 chicks	0.24 chicks	
Little Owl	42	46	Linear increase	2.54 chicks	2.8 chicks	0.26 chicks	
Whinchat	42	37	Linear increase	5.02 chicks	5.28 chicks	0.26 chicks	
Dipper	42	146	Curvilinear	3.44 chicks	3.77 chicks	0.33 chicks	
Merlin	42	55	Linear increase	3.49 chicks	3.84 chicks	0.35 chicks	
Starling	42	213	Linear increase	3.32 chicks	3.68 chicks	0.36 chicks	
Tree Sparrow	42	351	Curvilinear	3.77 chicks	4.15 chicks	0.38 chicks	
Redstart	42	87	Curvilinear	5.15 chicks	5.63 chicks	0.48 chicks	
Jay	42	11	Linear increase	3.39 chicks	3.96 chicks	0.57 chicks	Small sample
Nuthatch	42	73	Curvilinear	4.38 chicks	5.24 chicks	0.86 chicks	

3. Table of significant trends in Daily failure rate (eggs) measured between 1968-2010

Species	Period (yrs)	Mean annual sample	Trend	Predicted in first year	Predicted in last year	Change	Comment
Woodlark	42	22	Curvilinear	0.064 nests/day	0.0273 nests/day	-0.0367 nests/day	Small sample
Redshank	42	31	Linear decline	0.0399 nests/day	0.0137 nests/day	-0.0262 nests/day	
Magpie	42	48	Linear decline	0.0275 nests/day	0.002 nests/day	-0.0255 nests/day	
Long-tailed Tit	42	57	Linear decline	0.0329 nests/day	0.0083 nests/day	-0.0246 nests/day	
Dipper	42	105	Curvilinear	0.0278 nests/day	0.0034 nests/day	-0.0244 nests/day	
Yellowhammer	42	63	Curvilinear	0.0497 nests/day	0.0306 nests/day	-0.0191 nests/day	
Snipe	42	14	Linear decline	0.0317 nests/day	0.0132 nests/day	-0.0185 nests/day	Small sample
Carrion Crow	42	47	Linear decline	0.0174 nests/day	0.0013 nests/day	-0.0161 nests/day	Includes Hooded Crow
Woodpigeon	42	93	Curvilinear	0.0451 nests/day	0.0293 nests/day	-0.0158 nests/day	
Sand Martin	42	28	Linear decline	0.0151 nests/day	0 nests/day	-0.0151 nests/day	Small sample
Wood Warbler	42	23	Linear decline	0.0198 nests/day	0.0062 nests/day	-0.0136 nests/day	Small sample
Pied Wagtail	42	82	Linear decline	0.0184 nests/day	0.0067 nests/day	-0.0117 nests/day	
Robin	42	202	Curvilinear	0.0247 nests/day	0.0138 nests/day	-0.0109 nests/day	
Stock Dove	42	106	Linear decline	0.0159 nests/day	0.0053 nests/day	-0.0106 nests/day	
Redstart	42	74	Curvilinear	0.013 nests/day	0.0037 nests/day	-0.0093 nests/day	
Starling	42	120	Linear decline	0.0112 nests/day	0.0023 nests/day	-0.0089 nests/day	
Treecreeper	42	22	Curvilinear	0.0234 nests/day	0.0146 nests/day	-0.0088 nests/day	Small sample
Greenfinch	42	125	Linear decline	0.0247 nests/day	0.016 nests/day	-0.0087 nests/day	
Grey Wagtail	42	57	Linear decline	0.0181 nests/day	0.0095 nests/day	-0.0086 nests/day	

Species	Period (yrs)	Mean annual sample	Trend	Predicted in first year	Predicted in last year	Change	Comment
Tawny Owl	42	59	Curvilinear	0.0105 nests/day	0.0024 nests/day	-0.0081 nests/day	Nocturnal species
Buzzard	42	28	Linear decline	0.0086 nests/day	0.0005 nests/day	-0.0081 nests/day	Small sample
Wheatear	42	16	Curvilinear	0.0079 nests/day	0.0002 nests/day	-0.0077 nests/day	Small sample
Barn Owl	42	28	Linear decline	0.008 nests/day	0.0005 nests/day	-0.0075 nests/day	Small sample
Mistle Thrush	42	54	Linear decline	0.0248 nests/day	0.0175 nests/day	-0.0073 nests/day	
Blackcap	42	49	Linear decline	0.0218 nests/day	0.0146 nests/day	-0.0072 nests/day	
House Sparrow	42	111	Linear decline	0.011 nests/day	0.0039 nests/day	-0.0071 nests/day	
Nuthatch	42	52	Linear decline	0.0092 nests/day	0.0022 nests/day	-0.007 nests/day	
Wren	42	138	Linear decline	0.0186 nests/day	0.0123 nests/day	-0.0063 nests/day	
Marsh Tit	42	21	Linear decline	0.0073 nests/day	0.0012 nests/day	-0.0061 nests/day	Small sample
Merlin	42	24	Linear decline	0.0071 nests/day	0.0018 nests/day	-0.0053 nests/day	Small sample
Kestrel	42	41	Linear decline	0.0059 nests/day	0.0006 nests/day	-0.0053 nests/day	
Tree Sparrow	42	347	Linear decline	0.0086 nests/day	0.0033 nests/day	-0.0053 nests/day	
Jackdaw	42	61	Linear decline	0.0071 nests/day	0.0019 nests/day	-0.0052 nests/day	
Collared Dove	42	61	Curvilinear	0.0323 nests/day	0.0284 nests/day	-0.0039 nests/day	
Sparrowhawk	42	32	Linear decline	0.0046 nests/day	0.0007 nests/day	-0.0039 nests/day	
Coal Tit	42	56	Linear decline	0.005 nests/day	0.0014 nests/day	-0.0036 nests/day	
Reed Warbler	42	173	Linear decline	0.0166 nests/day	0.0133 nests/day	-0.0033 nests/day	
Pied Flycatcher	42	424	Curvilinear	0.0059 nests/day	0.0028 nests/day	-0.0031 nests/day	
Sedge Warbler	42	41	Curvilinear	0.0144 nests/day	0.0114 nests/day	-0.003 nests/day	
Great Tit	42	573	Linear decline	0.0051 nests/day	0.0024 nests/day	-0.0027 nests/day	
Raven	42	22	Curvilinear	0.0027 nests/day	0.0005 nests/day	-0.0022 nests/day	Small sample
Dunnock	42	141	Curvilinear	0.026 nests/day	0.0238 nests/day	-0.0022 nests/day	
Blue Tit	42	647	Linear decline	0.0035 nests/day	0.002 nests/day	-0.0015 nests/day	
Spotted Flycatcher	42	115	Curvilinear	0.0183 nests/day	0.0173 nests/day	-0.001 nests/day	
Curlew	42	22	Curvilinear	0.0278 nests/day	0.027 nests/day	-0.0008 nests/day	Small sample
Peregrine	42	23	Curvilinear	0.0018 nests/day	0.0018 nests/day	0 nests/day	Small sample
Grey Heron	42	18	Curvilinear	0 nests/day	0.0003 nests/day	0.0003 nests/day	Non-breeders include
Hen Harrier	42	10	Curvilinear	0.0002 nests/day	0.0006 nests/day	0.0004 nests/day	Small sample
Tree Pipit	42	13	Curvilinear	0.0505 nests/day	0.0522 nests/day	0.0017 nests/day	Small sample
Bullfinch	42	51	Curvilinear	0.0324 nests/day	0.0364 nests/day	0.004 nests/day	
Linnet	42	150	Linear increase	0.0184 nests/day	0.0229 nests/day	0.0045 nests/day	
Willow Warbler	42	67	Linear increase	0.0095 nests/day	0.0165 nests/day	0.007 nests/day	
Lapwing	42	133	Linear increase	0.0143 nests/day	0.0214 nests/day	0.0071 nests/day	
Whitethroat	42	43	Curvilinear	0.0103 nests/day	0.0175 nests/day	0.0072 nests/day	
Chaffinch	42	164	Curvilinear	0.0304 nests/day	0.0384 nests/day	0.008 nests/day	
Ringed Plover	42	125	Linear increase	0.0227 nests/day	0.0312 nests/day	0.0085 nests/day	
Reed Bunting	42	50	Curvilinear	0.0066 nests/day	0.0156 nests/day	0.009 nests/day	
Moorhen	42	113	Curvilinear	0.0128 nests/day	0.0237 nests/day	0.0109 nests/day	
Blackbird	42	273	Curvilinear	0.0263 nests/day	0.0378 nests/day	0.0115 nests/day	
Oystercatcher	42	118	Curvilinear	0.0154 nests/day	0.0377 nests/day	0.0223 nests/day	
Nightjar	42	24	Linear increase	0.0124 nests/day	0.0384 nests/day	0.026 nests/day	Small sample

4. Table of significant trends in Daily failure rate (chicks) measured between 1968-2010

Species	Period (yrs)	Mean annual sample	Trend	Predicted in first year	Predicted in last year	Change	Comment
Corn Bunting	42	14	Curvilinear	0.0435 nests/day	0.0176 nests/day	-0.0259 nests/day	Small sample
Skylark	42	53	Linear decline	0.0482 nests/day	0.0301 nests/day	-0.0181 nests/day	
Sand Martin	42	53	Linear decline	0.0172 nests/day	0.0004 nests/day	-0.0168 nests/day	
Magpie	42	47	Linear decline	0.0165 nests/day	0.0012 nests/day	-0.0153 nests/day	
Meadow Pipit	42	62	Linear decline	0.0259 nests/day	0.011 nests/day	-0.0149 nests/day	
Reed Warbler	42	135	Linear decline	0.0201 nests/day	0.006 nests/day	-0.0141 nests/day	
Grey Wagtail	42	57	Linear decline	0.0217 nests/day	0.0078 nests/day	-0.0139 nests/day	
Tree Sparrow	42	238	Linear decline	0.0151 nests/day	0.0054 nests/day	-0.0097 nests/day	
Blackbird	42	224	Linear decline	0.0287 nests/day	0.0191 nests/day	-0.0096 nests/day	
Redstart	42	53	Linear decline	0.0127 nests/day	0.0031 nests/day	-0.0096 nests/day	
Jackdaw	42	58	Linear decline	0.0115 nests/day	0.0023 nests/day	-0.0092 nests/day	
House Sparrow	42	104	Curvilinear	0.0141 nests/day	0.0064 nests/day	-0.0077 nests/day	
Carrion Crow	42	41	Linear decline	0.0077 nests/day	0.001 nests/day	-0.0067 nests/day	Includes Hooded Crow
Merlin	42	28	Linear decline	0.009 nests/day	0.0023 nests/day	-0.0067 nests/day	Small sample

Species	Period (yrs)	Mean annual sample	Trend	Predicted in first year	Predicted in last year	Change	Comment
Pied Wagtail	42	92	Linear decline	0.0126 nests/day	0.008 nests/day	-0.0046 nests/day	
Stock Dove	42	70	Linear decline	0.0112 nests/day	0.0071 nests/day	-0.0041 nests/day	
Starling	42	134	Linear decline	0.0058 nests/day	0.002 nests/day	-0.0038 nests/day	
Stonechat	42	60	Curvilinear	0.0162 nests/day	0.0133 nests/day	-0.0029 nests/day	
Tawny Owl	42	91	Curvilinear	0.0034 nests/day	0.0009 nests/day	-0.0025 nests/day	Nocturnal species
Nuthatch	42	60	Linear decline	0.0045 nests/day	0.0021 nests/day	-0.0024 nests/day	
Yellowhammer	42	50	Curvilinear	0.0446 nests/day	0.0424 nests/day	-0.0022 nests/day	
Barn Owl	42	128	Linear decline	0.002 nests/day	0.0002 nests/day	-0.0018 nests/day	
Kestrel	42	69	Linear decline	0.0021 nests/day	0.0009 nests/day	-0.0012 nests/day	
Dipper	42	81	Curvilinear	0.0062 nests/day	0.0051 nests/day	-0.0011 nests/day	
Raven	42	30	Curvilinear	0.0003 nests/day	0.0001 nests/day	-0.0002 nests/day	Small sample
Treecreeper	42	22	Curvilinear	0.015 nests/day	0.0154 nests/day	0.0004 nests/day	Small sample
Great Tit	42	397	Curvilinear	0.0057 nests/day	0.0063 nests/day	0.0006 nests/day	
Blue Tit	42	462	Curvilinear	0.0059 nests/day	0.0067 nests/day	0.0008 nests/day	
Chaffinch	42	114	Curvilinear	0.03 nests/day	0.0312 nests/day	0.0012 nests/day	
Swallow	42	482	Linear increase	0.003 nests/day	0.0044 nests/day	0.0014 nests/day	
Coal Tit	42	59	Linear increase	0.0017 nests/day	0.0045 nests/day	0.0028 nests/day	
Pied Flycatcher	42	347	Curvilinear	0.0029 nests/day	0.0057 nests/day	0.0028 nests/day	
Dunnock	42	115	Curvilinear	0.0244 nests/day	0.0278 nests/day	0.0034 nests/day	
Spotted Flycatcher	42	105	Linear increase	0.01 nests/day	0.014 nests/day	0.004 nests/day	
Marsh Tit	42	20	Linear increase	0.0046 nests/day	0.0093 nests/day	0.0047 nests/day	Small sample
Willow Warbler	42	123	Linear increase	0.0153 nests/day	0.0202 nests/day	0.0049 nests/day	
Linnet	42	108	Linear increase	0.0157 nests/day	0.0223 nests/day	0.0066 nests/day	
Nightjar	42	22	Curvilinear	0.0016 nests/day	0.0086 nests/day	0.007 nests/day	Small sample
Long-tailed Tit	42	39	Linear increase	0.0076 nests/day	0.0188 nests/day	0.0112 nests/day	
Garden Warbler	42	20	Linear increase	0.0111 nests/day	0.026 nests/day	0.0149 nests/day	Small sample
Bullfinch	42	34	Curvilinear	0.0323 nests/day	0.049 nests/day	0.0167 nests/day	
Tree Pipit	42	21	Curvilinear	0.0335 nests/day	0.0515 nests/day	0.018 nests/day	Small sample

Discussion

In this discussion we:

1. Review the latest population change measures and alerts for species that are on the Birds of Conservation Concern (BoCC3) red or amber lists for the UK for reasons of population decline (Eaton *et al.* 2009) (*here*).
2. Identify species not on the BoCC3 lists but which raise alerts on account of long-term declines and, conversely, currently listed species where recovery may be sufficient to downgrade their listing status in the future (*here*).
3. Briefly review declines along waterways and in scrub and wetland habitats as shown by the WBS/WBBS and CES schemes (*here*).
4. Review trends over the last 10 years in species that have shown long-term declines, to identify the extent of ongoing declines and check for any evidence of recovery (*here*).
5. Identify those species that have shown rapid long-term population increases (*here*).
6. Discuss patterns of changes in breeding performance and relationships between trends in abundance and breeding performance (*here*).
7. Summarise the overall patterns found (*here*).

Except where otherwise indicated, our discussion is based on the best long-term trend that is available for each species. These are the trends presented as the main trend graph for each species. Details of estimating and comparing trends are given in the methods section. Full details of all trends available for each species are given on the species pages. Summary tables of all alerts raised by each scheme are presented in the summary tables.

It should be noted that a number of species included in the BoCC3 red and amber lists are not covered by this report, and that not every species listed amber is in UK decline. Thus tables relating to red or amber list status do not include every species so listed.

Latest long-term alerts

This report uses a standardised system for setting 'alerts' that has been agreed between the providers and users of population monitoring information in the UK. The system provides alerts to population declines of 25–50% and of >50% over short, medium and longer terms (5 years, 10 years and 25+ years respectively). These help to highlight the scale and timing of declines, and act as an aid to interpreting the trend graphs presented. Our main emphasis is on long-term declines measured over the longest period available (usually 43 years) and over 25 years, which is one of the periods used to determine red and amber listing (Eaton *et al.* 2009). Alerts triggered over the short term for individual species should be considered as early warnings, indicating that conservation issues may be developing for these species. Some short-term declines might stem, however, from chance fluctuations in abundance, from which the population is able to recover without assistance. The steep decline of a suite of species of similar ecology should be considered as a stronger indication that potential problems may be developing. Details of the alerts and methodology used in this report are given in the methods section.

These alerts are therefore important for conservation practitioners who need to set priorities for conservation action, but we hope that they will also prove of interest to more general readers of the report. Similar alerts for wetland birds are provided by the Wetland Bird Survey (Thaxter *et al.* 2010).

Where this section discusses conservation-listed species, it uses the now-current version of these lists, introduced in 2009 and abbreviated as BoCC3. The full paper (Eaton *et al.* 2009) details the criteria by which each listed species qualifies for its red or amber status. All of the red-listed species that breed in the UK have automatically satisfied criteria for UK decline, but amber-listed birds may be listed for other reasons (see Key to species texts).

Long-term trends of 'Birds of Conservation Concern' red-listed species

The species considered in this section are red-listed wholly or partly because of severe UK population declines revealed by annual census data, amounting to more than 50% either over the 25-year period 1981–2006 or, in four cases (Skylark, Song Thrush, Marsh Tit and Linnet), over the 37-year period 1969–2006. The latest long-term population changes and alerts for these severely declining species are shown in Table A1, over the maximum period available (usually the 43 years 1967–2010) and over 25 years (1985–2010). This table thus updates the figures that were used to produce the current BoCC3 red list.

The 19 species in Table A1 are listed in descending order of longest-term percentage change.Tree Sparrow heads the table once again, with the strongest long-term decline of any species, despite significant increases in numbers recorded by BBS since 1995. The figures for Lesser Spotted Woodpecker are likely to be a very large underestimate of the current population change, because the species had by 1999 become too rare for further annual monitoring. Were recent data available, this species might easily surpass Tree Sparrow in the strength of its decline.

Table A1 Latest trends for red-listed species

Species	Period (yrs)	Source	Change (%)	Lower limit	Upper limit	Alert	Comment
Tree Sparrow	43	CBC/BBS England	-96	-98	-91	>50	
Tree Sparrow	25	CBC/BBS England	-72	-87	-52	>50	
Turtle Dove	43	CBC/BBS UK	-93	-95	-89	>50	
Turtle Dove	25	CBC/BBS UK	-88	-92	-84	>50	
Grey Partridge	43	CBC/BBS UK	-91	-94	-86	>50	
Grey Partridge	25	CBC/BBS UK	-79	-84	-71	>50	
Willow Tit	43	CBC/BBS UK	-91	-96	-85	>50	
Willow Tit	25	CBC/BBS UK	-88	-93	-83	>50	
Spotted Flycatcher	43	CBC/BBS UK	-89	-93	-85	>50	
Spotted Flycatcher	25	CBC/BBS UK	-81	-88	-75	>50	
Starling	43	CBC/BBS England	-88	-91	-84	>50	
Starling	25	CBC/BBS England	-80	-84	-77	>50	
Corn Bunting	43	CBC/BBS UK	-88	-94	-80	>50	
Corn Bunting	25	CBC/BBS UK	-72	-86	-55	>50	
Tree Pipit	43	CBC/BBS England	-86	-94	-74	>50	
Tree Pipit	25	CBC/BBS England	-87	-93	-77	>50	
Lesser Redpoll	43	CBC/BBS England	-86	-95	-64	>50	
Lesser Redpoll	25	CBC/BBS England	-91	-96	-82	>50	
Yellow Wagtail	43	CBC/BBS UK	-76	-88	-53	>50	
Yellow Wagtail	25	CBC/BBS UK	-71	-83	-59	>50	
Linnet	43	CBC/BBS England	-74	-80	-66	>50	
Linnet	25	CBC/BBS England	-22	-38	-6		
Cuckoo	43	CBC/BBS England	-73	-80	-62	>50	
Cuckoo	25	CBC/BBS England	-72	-76	-68	>50	
Marsh Tit	43	CBC/BBS UK	-72	-81	-63	>50	
Marsh Tit	25	CBC/BBS UK	-42	-57	-27	>25	

Species	Period (yrs)	Source	Change (%)	Lower limit	Upper limit	Alert	Comment
House Sparrow	33	CBC/BBS England	-69	-78	-58	>50	
House Sparrow	25	CBC/BBS England	-46	-58	-27	>25	
Skylark	43	CBC/BBS England	-64	-69	-56	>50	
Skylark	25	CBC/BBS England	-37	-44	-29	>25	
Lesser Spotted Woodpecker	31	CBC to 1999	-60	-81	40		Small sample
Lesser Spotted Woodpecker	25	CBC to 1999	-73	-86	-31	>50	Small sample
Yellowhammer	43	CBC/BBS UK	-56	-64	-46	>50	
Yellowhammer	25	CBC/BBS UK	-52	-58	-46	>50	
Song Thrush	43	CBC/BBS UK	-54	-61	-45	>50	
Song Thrush	25	CBC/BBS UK	-4	-15	8		
Lapwing	43	CBC/BBS UK	-45	-68	-18	>25	
Lapwing	25	CBC/BBS UK	-57	-66	-45	>50	

For Linnet, Marsh Tit, House Sparrow, Skylark and Song Thrush, the 25-year change is less than 50%, indicating that, while these species meet red-list criteria for long-term change, their recent rate of decline has been slower than for most other red-listed birds. For Song Thrush, the 25-year trend is effectively stable. By contrast, the 25-year trend for Lapwing is a significant decline of 57% but, over the longer period, the decline fails to meet red-list criteria.

Long-term trends of declining amber-listed species

There are 40 amber-listed species that are included in this report, of which about half (19 species) are listed because of UK population declines over the periods 1981–2006 or 1969–2006. Long-term trends are available from annual census data for 13 of these species, which are listed in Table A2 in descending order of longest-term percentage change (normally over the 43 years 1967–2010). Where available the 25-year change (1985–2010) is also shown.

Table A2 Latest trends for declining amber-listed species

Species	Period (yrs)	Source	Change (%)	Lower limit	Upper limit	Alert	Comment
House Martin	43	CBC/BBS England	-64	-89	41		
House Martin	25	CBC/BBS England	-59	-88	62		
Redshank	35	WBS/WBBS waterways	-62	-88	-24	>50	
Redshank	25	WBS/WBBS waterways	-61	-80	-35	>50	
Willow Warbler	43	CBC/BBS England	-58	-68	-42	>50	
Willow Warbler	25	CBC/BBS England	-59	-65	-52	>50	
Mistle Thrush	43	CBC/BBS UK	-56	-63	-46	>50	
Mistle Thrush	25	CBC/BBS UK	-44	-50	-36	>25	
Whitethroat	43	CBC/BBS UK	-55	-68	-38	>50	
Whitethroat	25	CBC/BBS UK	151	112	197		
Meadow Pipit	43	CBC/BBS England	-49	-74	-22	>25	
Meadow Pipit	25	CBC/BBS England	-30	-44	-11	>25	
Grey Wagtail	35	WBS/WBBS waterways	-49	-61	-35	>25	
Grey Wagtail	25	WBS/WBBS waterways	-6	-23	11		
Little Grebe	35	WBS/WBBS waterways	-45	-73	27		
Little Grebe	25	WBS/WBBS waterways	-22	-53	44		
Common Sandpiper	35	WBS/WBBS waterways	-41	-58	-27	>25	
Common Sandpiper	25	WBS/WBBS waterways	-46	-57	-37	>25	
Bullfinch	43	CBC/BBS UK	-39	-51	-22	>25	
Bullfinch	25	CBC/BBS UK	-7	-20	9		
Curlew	43	CBC/BBS England	-38	-74	18		
Curlew	25	CBC/BBS England	-29	-58	8		
Dunnock	43	CBC/BBS UK	-34	-41	-22	>25	
Dunnock	25	CBC/BBS UK	15	4	29		
Reed Bunting	43	CBC/BBS UK	-24	-40	-2		
Reed Bunting	25	CBC/BBS UK	17	-1	44		

Species	Period (yrs)	Source	Change (%)	Lower limit	Upper limit	Alert	Comment

Our best estimate of long-term change in the English House Martin population shows a decline of more than 50%, but statistically it is not significantly different from no change and therefore no alerts are raised formally for this species. It may be a candidate for red listing but for now is perhaps best regarded as 'data deficient'. BBS data indicate increases in Scotland and Northern Ireland, however.

Four species raise high alerts, having shown significant declines of greater than 50%. Redshank has declined steeply in lowland Britain, according to waterways surveys, raising high alerts; a major decline is also documented for its breeding sites on saltmarsh, and BBS data show that decline has occurred recently across a wide range of habitats. English Willow Warblers meet the red-list criterion for population decline, but there has been little change in Wales and overall increase in Scotland and Northern Ireland since 1995. Continuing decline for Mistle Thrush has taken its 43-year trend over the 50% threshold for rapid decline. It now joins the list of potential red-list candidates. Whitethroat shows substantial decline over the 43-year period, since this includes the extraordinary population crash that occurred between 1968 and 1969, but the 25-year period has seen a considerable reversal of this decrease.

Five species raise the lower level of alert. Meadow Pipit and Common Sandpiper meet the 25% criterion (equivalent to amber listing) in both periods. Populations of Grey Wagtail, Bullfinch and Dunnock are recovering and show stable or increasing trends over the shorter, 25-year period. Data for Little Grebe and Curlew suggest a similar overall rate of decline but their trends should be treated with caution, as the confidence intervals are very wide. For Little Grebe, BBS results show little change since 1995.

Reed Bunting now shows only a shallow decline over the 43-year period and has ceased to raise any alerts for population decline.

Long-term declines of species that are not currently red or amber listed (for declines)

This section of the report draws attention to declines which currently surpass red or amber criteria but which were not recognised in the 2009 listings (Table A3). These species may be candidates for conservation listing at the next review.

Table A3 Long-term trends for declining species not on the red or amber list (for declines)

Species	Period (yrs)	Source	Change (%)	Lower limit	Upper limit	Alert	Comment
Snipe	35	WBS/WBBS waterways	-93	-99	-73	>50	Small sample
Snipe	25	WBS/WBBS waterways	-92	-98	-78	>50	Small sample
Woodcock	31	CBC to 1999	-74	-88	-49	>50	Small sample
Woodcock	25	CBC to 1999	-76	-88	-51	>50	Small sample
Little Owl	43	CBC/BBS UK	-61	-76	-42	>50	
Little Owl	25	CBC/BBS UK	-65	-75	-51	>50	
Tawny Owl	25	CBC/BBS UK	-34	-50	-18	>25	
Dipper	35	WBS/WBBS waterways	-30	-45	-11	>25	

The WBS/WBBS trend for Snipe is based now on a very small sample of plots, the species having deserted so many of its former riverside haunts. It is currently amber-listed solely because it is a Species of European Conservation Concern (SPEC category 3) through its moderate decline on the European scale (BiE04). There is ample evidence, however, that its breeding range has contracted sharply, especially in lowland England.

Similarly, Woodcock is currently amber-listed solely because it is a Species of European Conservation Concern (SPEC category 3) through its moderate decline on the European scale (BiE04). The only UK census data indicating a trend are from CBC, which recorded steep declines. Samples were small, however, and the CBC's mapping method was not well suited to monitoring this species: for these reasons, the CBC trend is no longer used to support the species' conservation listing.

Little Owl also meets red-list criteria for population decline but, as an introduced species, is not eligible for any conservation listing. Tawny Owl has passed the criteria for amber listing, with a decline >25% over the 25-year period. Although the trends are statistically significant, it should be borne in mind that neither CBC nor BBS field techniques cater well for nocturnal and crepuscular species.

Fluctuations in the UK Dipper population since 1974 appear to be underlain by decrease. The current estimate of long-term change clearly raises an alert but decrease over the latest 25-year period, though statistically significant, is less than 25%.

Declines along linear waterways

The Waterways Bird Survey and Waterways Breeding Bird Survey supplement the results from CBC and BBS, which are more broadly-based surveys, by measuring trends in bird populations alongside rivers and canals. Joint WBS/WBBS trends allow trend assessment to be continuous since 1974 for up to 25 species that were covered by WBS. WBBS, ongoing since 1998, includes all bird species but waterways trends are presented here only for waterway-specialist species, for which joint WBS/WBBS trends are available. A full set of up-to-date WBS/WBBS trends can be obtained from the Table generator.

For several species, such as Canada Goose, Goosander and Kingfisher, that are abundant in waterway habitats, the WBS/WBBS trend provides our headline information on population trends. For Redshank, Little Grebe, Common Sandpiper, Grey Wagtail, Snipe and Dipper, which are also in this category and are in decline, latest trends appear in Tables A2 or A3, as appropriate. Even where WBS/WBBS is not the headline trend for a species, however, the waterways data provide valuable supplementary information from this sensitive habitat.

Table A4 lists all statistically significant declines of greater than 25% recorded from the full period of waterway monitoring (nominally 1975–2010). It does not include Little Grebe, for which the decline is not statistically significant (Table A2).

Table A4 Population declines of greater than 25% recorded by the joint Waterways Bird Survey/Waterways Breeding Bird Survey (WBS/WBBS) between 1975 and 2010

Species	Period (yrs)	Source	Change (%)	Lower limit	Upper limit	Alert	Comment
Yellow Wagtail	35	WBS/WBBS waterways	-94	-98	-87	>50	
Snipe	35	WBS/WBBS waterways	-93	-99	-73	>50	Small sample
Pied Wagtail	35	WBS/WBBS waterways	-68	-76	-61	>50	
Redshank	35	WBS/WBBS waterways	-62	-88	-24	>50	
Reed Bunting	35	WBS/WBBS waterways	-58	-69	-41	>50	
Grey Wagtail	35	WBS/WBBS waterways	-49	-61	-35	>25	
Common Sandpiper	35	WBS/WBBS waterways	-41	-58	-27	>25	
Dipper	35	WBS/WBBS waterways	-30	-45	-11	>25	
Sedge Warbler	35	WBS/WBBS waterways	-30	-50	-5	>25	
Moorhen	35	WBS/WBBS waterways	-26	-42	-7	>25	

Five species are included for which WBS/WBBS is not the headline trend and so are not listed in Tables A2 or A3. These are discussed briefly below. The trends for Yellow Wagtail and Reed Bunting are consistent in direction with the 43-year trends reported from CBC/BBS, but in each case the declines on waterways have been more severe. The Pied Wagtail declines along waterways, which are significant in all the periods assessed, are intriguing because they contrast markedly with the fluctuating but generally upward trend as measured by CBC/BBS. The cause of the decline along waterways is currently unknown. For Reed Bunting, the trend along waterways has also been less positive than in the countryside as a whole.

For Sedge Warbler, the headline trend for the UK is a non-significant 43-year shallow decline, from CBC/BBS. Large fluctuations make trends difficult to determine in this species, but the WBS/WBBS data add firmer evidence for a long-term moderate decrease.

Moorhen is a new addition to this table: its numbers have dipped sharply by all measures in recent seasons, perhaps through extra mortality in cold winters, and its long-term change has tipped marginally over the alert threshold.

A full set of alerts raised by WBS/WBBS, and long-term increases detected by that index, are tabulated in WBS/WBBS alerts and population increases.

Declines on CES plots

The Constant Effort Sites Scheme provides trends from standardised ringing in scrub and wetland habitats. It is possibly our best scheme for monitoring some bird populations inhabiting reed beds but its main objective is to collect integrated data on relative abundance, productivity and survival for a suite of species. The longest trends currently available from the CES cover a period of 26 years (Table A5).

Table A5 Population declines of greater than 25% recorded by the Constant Effort Sites scheme between 1984 and 2010

Species	Period (yrs)	Source	Change (%)	Lower limit	Upper limit	Alert	Comment
Reed Bunting	26	CES adults	-66	-75	-53	>50	
Reed Bunting	25	CES adults	-63	-72	-49	>50	
Willow Warbler	26	CES adults	-65	-73	-56	>50	
Willow Warbler	25	CES adults	-62	-70	-53	>50	
Lesser Whitethroat	26	CES adults	-63	-79	-43	>50	
Lesser Whitethroat	25	CES adults	-63	-77	-48	>50	
Willow Tit	26	CES adults	-51	-86	-10	>50	Small sample
Willow Tit	25	CES adults	-55	-87	-18	>50	Small sample
Sedge Warbler	26	CES adults	-39	-56	-21	>25	
Sedge Warbler	25	CES adults	-41	-55	-28	>25	
Song Thrush	26	CES adults	-30	-44	-15	>25	
Reed Warbler	26	CES adults	-30	-44	-12	>25	
Reed Warbler	25	CES adults	-27	-42	-9	>25	

Most of the species that are declining on CES sites show broadly similar trends to those from CBC/BBS or WBS/WBBS dataWillow Tit and Song Thrush are red listed on the strength of their long-term CBC/BBS declines (Table A1). Similarly, Willow Warbler, Reed Bunting, and Whitethroat are amber listed.

For reasons unknown, CES trends for Reed Bunting, Lesser Whitethroat, Sedge Warbler, Song Thrush and Reed Warbler are considerably more negative than those from census data. Both CBC/BBS and WBS/WBBS show strong increases for Reed Warbler, in stark contrast to the CES data presented here.

A full set of alerts raised by CES, and long-term increases detected by that scheme, are tabulated in CES alerts and population increases.

Ten-year trends and evidence of species recovery

If the status of species that have shown long-term declines were now improving, we would expect to find trends to be more positive in recent years than in the earlier part of the time series. To examine this, we list in Table B1 the best change estimates over the most recent ten-year period for which we have data (2000–10 in all but two cases), for all of the declining species listed in Tables A1–A3. For Lesser Spotted Woodpecker and for Woodcock, both now too scarce for annual monitoring to continue, the ten-year period for which data are tabulated is 1989–99.

Table B1 also includes six further species which are listed red or amber in BoCC3 because of recent breeding decline, and for which we can report ten-year trends, but which lacked monitoring data before 1994. These are Grasshopper Warbler and Wood Warbler (both red listed), and Red Grouse, Swift, Nightingale and Whinchat (all amber listed).

Table B1 Ten-year trends for species that have shown long-term declines

Species	Period (yrs)	Source	Change (%)	Lower limit	Upper limit	Alert	Comment
Turtle Dove	10	CBC/BBS UK	-73	-77	-67	>50	
Willow Tit	10	CBC/BBS UK	-63	-73	-54	>50	
Lesser Spotted Woodpecker	10	CBC to 1999	-51	-75	-22	>50	Small sample
Cuckoo	10	CBC/BBS England	-47	-52	-43	>25	
Little Owl	10	CBC/BBS UK	-46	-55	-36	>25	
Starling	10	CBC/BBS England	-46	-49	-42	>25	
Nightingale	10	BBS England	-46	-56	-24	>25	
Snipe	10	WBS/WBBS waterways	-44	-70	1		
Whinchat	10	BBS UK	-44	-57	-30	>25	
Woodcock	10	CBC to 1999	-40	-62	-11	>25	Small sample
Spotted Flycatcher	10	CBC/BBS UK	-39	-54	-23	>25	
Wood Warbler	10	BBS UK	-39	-62	-13	>25	
Redshank	10	WBS/WBBS waterways	-37	-52	-7	>25	
Grey Partridge	10	CBC/BBS UK	-35	-46	-26	>25	
Yellow Wagtail	10	CBC/BBS UK	-35	-44	-21	>25	
Mistle Thrush	10	CBC/BBS UK	-33	-37	-28	>25	
Tree Pipit	10	CBC/BBS England	-33	-49	-13	>25	
Swift	10	BBS UK	-29	-35	-22	>25	
Grey Wagtail	10	WBS/WBBS waterways	-26	-37	-14	>25	
Marsh Tit	10	CBC/BBS UK	-25	-38	-13	>25	
Tawny Owl	10	CBC/BBS UK	-25	-38	-8	>25	
Curlew	10	CBC/BBS England	-24	-30	-16		
Lapwing	10	CBC/BBS UK	-22	-30	-13		
Dipper	10	WBS/WBBS waterways	-19	-28	-8		
Common Sandpiper	10	WBS/WBBS waterways	-18	-30	-8		
Willow Warbler	10	CBC/BBS England	-18	-24	-12		
Linnet	10	CBC/BBS England	-16	-21	-9		
House Martin	10	CBC/BBS England	-15	-25	-8		
Corn Bunting	10	CBC/BBS UK	-13	-32	4		
Red Grouse	10	BBS UK	-13	-25	-2		
Skylark	10	CBC/BBS England	-12	-16	-8		
Meadow Pipit	10	CBC/BBS England	-11	-21	-2		
Yellowhammer	10	CBC/BBS UK	-7	-12	-2		
House Sparrow	10	CBC/BBS England	-1	-6	5		
Song Thrush	10	CBC/BBS UK	-1	-5	4		
Little Grebe	10	WBS/WBBS waterways	2	-28	67		
Lesser Redpoll	10	CBC/BBS England	4	-43	65		
Dunnock	10	CBC/BBS UK	11	7	14		
Reed Bunting	10	CBC/BBS UK	23	10	37		

Species	Period (yrs)	Source	Change (%)	Lower limit	Upper limit	Alert	Comment
Whitethroat	10	CBC/BBS UK	28	25	36		
Bullfinch	10	CBC/BBS UK	29	21	41		
Grasshopper Warbler	10	BBS UK	47	22	83		
Tree Sparrow	10	CBC/BBS England	50	23	81		

Species are listed in ascending order of population change. Thus the species with the steepest recent decline appear first. Towards the foot of the table are species that remain in long-term decline but have shown partial recovery of those losses during the recent ten-year period.

As indicated at the top of Table B1, there is high confidence that the populations of both Willow Tit and Turtle Dove have halved within just the last ten years, or indeed a shorter period. These are the only species in long-term decline suffering a 50% fall during 2000–10, but Lesser Spotted Woodpecker also met this criterion during the most recent ten-year period for which data are available. A further 17 also continue to raise alerts, having declined significantly by more than 25% (but less than 50%) in this ten-year period. All these declines compound earlier losses for these species. The ongoing declines of so many of the species listed in Table B1 raises serious conservation concern.

The 25% threshold, which is used to define decreases over the 25-year period that are worthy of amber listing, is equivalent to a change of 11% (10.9%) over ten years, assuming a constant rate of change. Thus a decrease of 11% or greater listed in Table B1 indicates that these species (32 in all) are on course for red or amber listing. A smaller decrease, or an increase, indicates that the population decline may be easing off. Species that have declined in the longer term but with losses smaller than 11%, or with no measurable population change, over the ten-year period are Yellowhammer, House Sparrow, Song Thrush, Little Grebe and Lesser Redpoll.

Six species at the foot of the table show significant gains in population over the last ten years. Despite its recent increase, the long-term decline of Whitethroat was recognised in 2009 by the move of the species from the green to the amber list. Whitethroat numbers have increased steadily since the mid 1980s but are still far below the level prior to their population crash in 1968/69. Tree Sparrow and Grasshopper Warbler remain on the red list, and Dunnock and Bullfinch on the amber list, because their recent increases also represent only a small recovery from earlier losses. The increase in Tree Sparrow numbers is very welcome but is coming from such a low level that numbers remain far below those of the mid 1970s, with the population trend graph still showing little sign of a clear recovery. Because of its recent steep upturn, however, Reed Bunting was moved in 2009 from the red to the amber list.

Increasing species

Population changes of species for which our best long-term trend estimate from CBC/BBS (usually over 43 years) or from WBS/WBBS (a maximum of 35 years) shows an increase of more than 50% are shown in Table C1. There are 30 species listed, exactly as last year. Twenty-one of the species have more than doubled their population size over the periods given.

Table C1 Long-term population increases of greater than 50% from CBC/BBS (1967-2010) or WBS/WBBS (1975-2010), using the best survey for each species

Species	Period (yrs)	Source	Change (%)	Lower limit	Upper limit	Alert	Comment
Buzzard	43	CBC/BBS England	670	413	1736		
Greylag Goose	17	WBS/WBBS waterways	436	175	1116		
Great Spotted Woodpecker	43	CBC/BBS UK	408	247	657		
Shelduck	31	CBC to 1999	300	94	787		Small sample
Nuthatch	43	CBC/BBS UK	235	146	360		
Mute Swan	43	CBC/BBS UK	233	49	617		
Blackcap	43	CBC/BBS UK	224	175	312		
Green Woodpecker	43	CBC/BBS England	199	121	354		
Canada Goose	29	WBS/WBBS waterways	197	49	629		
Stock Dove	43	CBC/BBS England	180	90	347		
Woodpigeon	43	CBC/BBS UK	169	46	509		
Mallard	43	CBC/BBS UK	168	100	223		
Sparrowhawk	35	CBC/BBS England	140	45	269		
Long-tailed Tit	43	CBC/BBS England	121	69	213		
Carrion Crow	43	CBC/BBS England	119	78	177		
Reed Warbler	43	CBC/BBS UK	116	40	377		
Jackdaw	43	CBC/BBS UK	114	49	264		
Great Tit	43	CBC/BBS UK	112	85	147		
Magpie	43	CBC/BBS UK	101	61	151		
Tufted Duck	35	WBS/WBBS waterways	94	-28	376		
Pheasant	43	CBC/BBS England	92	53	173		
Goosander	29	WBS/WBBS waterways	87	22	220		
Coal Tit	43	CBC/BBS UK	76	3	179		
Goldfinch	43	CBC/BBS England	74	38	134		
Oystercatcher	35	WBS/WBBS waterways	70	32	175		
Chiffchaff	43	CBC/BBS UK	69	39	112		
Wren	43	CBC/BBS UK	57	40	75		
Pied Wagtail	43	CBC/BBS UK	53	9	121		

Four of the fastest-increasing species in this report are actually not included in Table C1, because their monitoring data cover too short a period. The population of Ring-necked Parakeet is estimated to have risen by 1012% (more than an elevenfold increase) over the 15 years 1995–2010. Arguably, however, this is more a conservation problem than a success! Unmitigated successes are the growth during 1995–2010, estimated through BBS, of the reintroduced Red Kite (+572%) and of Barn Owl (+390%). Attention should also be drawn to the rapid rise of Cetti's Warbler, a newly established native species, which has increased by an estimated 128% over the recent ten-year period, according to CES data, despite recent cold-weather-related setbacks.

Four groups stand out among the increasing species: corvids – Carrion Crow, Magpie and Jackdaw; doves – Collared Dove, Stock Dove and Woodpigeon; insectivores; and some waterbirds. Corvids appear to have benefited from gamebird management practices in recent years, and the larger doves from the increased acreage of brassica crops (particularly oilseed rape).

The majority of increasing insectivores are woodland species that are also common in gardens: Great Spotted Woodpecker, Green Woodpecker, Nuthatch, Blackcap, Great Tit, Wren, Long-tailed Tit and Coal Tit. The reasons for these increases are presently unclear. Pied Wagtail has increased in numbers by 53% on CBC/BBS plots over 43 years, but declined by 68% on WBS/WBBS plots over the past 35 years. The former index is likely to be more representative of the UK population as a whole. Reed Warbler, also an insectivore, has been expanding its range northwards and westwards and might be benefiting from climate change.

A number of species associated with freshwater habitats are becoming more abundant, although differences between their ecological requirements make it unlikely that the major causal factors are common to all. For Mallard, the CBC/BBS increase was matched by a WBS/WBBS increase of 219% over 35 years. The long-term increases recorded for Mute Swan on both CBC/BBS and WBS/WBBS plots are likely to be the result of banning the use of lead weights by anglers, which took effect in 1986. Greylag Goose, Shelduck, Canada Goose, Tufted Duck, Coot and Goosander are other wildfowl among this report's increasing species. Oystercatchers have increased by 70% on WBS/WBBS plots over the last 35 years. This finding is consistent with the results of the most recent survey of *Breeding Waders of Wet Meadows* which found that numbers of Oystercatchers using these habitats in England and Wales increased by 51% between 1982 and 2002 (Wilson*et al.* 2005).

Two widespread raptors have shown remarkable recoveries from low population levels caused by farmland pesticides in the 1950s and 1960s, assisted by a relaxation of illegal predator control by shooting interests. Buzzards increased by a remarkable 670% between 1967 and 2010, with a rapid increase of 82% over the last ten years alone. Sparrowhawks, too scarce for CBC to monitor until the mid 1970s, showed a 140% increase over the 35-year period from 1975 to 2010. However, their recovery appears to have been completed earlier than Buzzard's, with the population currently in shallow decline.

While Pheasant holds a place in this table, its increase has been driven largely by the hugely increasing scale of releases for shooting, from which the corvids may also have benefited.

Changes in breeding performance

Changes in a range of aspects of breeding performance can be measured under the Nest Record Scheme (NRS) and the Constant Effort Sites (CES) scheme. The NRS provides information on components of breeding performance per nesting attempt (clutch size, brood size and failure rates at the egg and nestling stages) that can be combined to give an overall estimate of the number of Fledglings produced Per Breeding Attempt (FPBA) – see NRS page for further information. The CES scheme provides an index of breeding performance accrued over all nesting attempts in a particular year. CES results also take into account any changes in the survival rates of fledglings in the first few months after leaving the nest, a period when losses of young can be high.

Breeding performance may be influenced by a variety of factors, including food availability, predation pressure and weather conditions. Variation in breeding performance may help to influence fluctuations in abundance and may even be the main demographic factor responsible for determining the size of the population. Conversely, the breeding performance of a population may be inversely related to its size, with productivity decreasing as the number of individuals increases, and vice versa. This relationship may be due to the action of density-dependent factors, such as competition for resources: as numbers increase, competition for resources is likely to increase, possibly resulting in poorer productivity. Alternatively, increases in abundance may be accompanied by range expansion into new, suboptimal habitats where breeding performance is poorer, thus reducing the average productivity of the population. The converse is also true, and where declines result from the loss of individuals from these suboptimal habitats, there may be a subsequent increase in average productivity.

Changes in Fledglings Per Breeding Attempt from Nest Record Scheme data

The NRS started collating nest histories of individual breeding attempts in 1939 and sufficient data are available for trends to be produced from the mid 1960s onwards. Previous reports have explored annual variation in clutch size, brood size and stage-specific nest failure rates, and these breeding parameters are included in the Summary tables. While detailed exploration of annual variation in productivity is essential if the impacts of environmental factors on breeding success are to be fully understood, the combined effects of concurrent changes in the number of offspring and failure rates can be difficult to interpret. These measures are therefore integrated into a single annual figure representing the mean number of young leaving each nest, termed Fledglings Per Breeding Attempt (FPBA; Siriwardena *et al.* 2000b, Crick *et al.* 2003).

All species displaying significant temporal trends in mean FPBA are included in Table D1. In total, 36 species exhibited significant trends in FPBA over the past 42 years, of which seven were negative, indicating that reproductive output has decreased over time. Birds exhibiting declines in productivity include two BoCC red-listed species (Nightjar and Tree Pipit), two amber-listed species (Willow Warbler and Bullfinch) and three green-listed species (Coal Tit, Treecreeper and Chaffinch). While productivity of Nightjar and Willow Warbler has been falling consistently, trends for the other five species are curvilinear, increasing up to the mid 1980s and decreasing thereafter.

Table D1 Significant trends in fledglings per breeding attempt measured between 1968 and 2010

Species	Period (yrs)	Mean annual sample	Trend	Predicted in first year	Predicted in last year	Change	Comment
Nightjar	42	21	Linear decline	1.43 fledglings	0.71 fledglings	-0.72 fledglings	Small sample
Coal Tit	42	54	Curvilinear	6.65 fledglings	6.1 fledglings	-0.55 fledglings	
Willow Warbler	42	67	Linear decline	3.59 fledglings	3.17 fledglings	-0.42 fledglings	
Bullfinch	42	33	Curvilinear	1.44 fledglings	1.18 fledglings	-0.26 fledglings	
Tree Pipit	42	13	Curvilinear	1.52 fledglings	1.29 fledglings	-0.23 fledglings	Small sample
Chaffinch	42	114	Curvilinear	1.57 fledglings	1.41 fledglings	-0.16 fledglings	
Treecreeper	42	20	Curvilinear	2.65 fledglings	2.64 fledglings	-0.01 fledglings	Small sample
Dunnock	42	109	Curvilinear	1.68 fledglings	1.69 fledglings	0.01 fledglings	
Blackbird	42	224	Curvilinear	1.47 fledglings	1.54 fledglings	0.07 fledglings	
Collared Dove	42	54	Curvilinear	0.81 fledglings	0.92 fledglings	0.11 fledglings	
House Sparrow	42	98	Curvilinear	2.32 fledglings	2.48 fledglings	0.16 fledglings	
Woodpigeon	42	73	Curvilinear	0.54 fledglings	0.75 fledglings	0.21 fledglings	
Yellowhammer	42	49	Curvilinear	0.79 fledglings	1.09 fledglings	0.3 fledglings	
Meadow Pipit	42	44	Curvilinear	2.07 fledglings	2.37 fledglings	0.3 fledglings	
Stock Dove	42	70	Linear increase	0.98 fledglings	1.38 fledglings	0.4 fledglings	
Robin	42	185	Linear increase	2.43 fledglings	2.84 fledglings	0.41 fledglings	
Sedge Warbler	42	39	Linear increase	3.17 fledglings	3.64 fledglings	0.47 fledglings	
Sparrowhawk	42	32	Curvilinear	2.63 fledglings	3.12 fledglings	0.49 fledglings	
Reed Warbler	42	135	Linear increase	2.34 fledglings	2.83 fledglings	0.49 fledglings	
Buzzard	42	28	Linear increase	1.51 fledglings	2.07 fledglings	0.56 fledglings	Small sample
Skylark	42	42	Linear increase	1.04 fledglings	1.6 fledglings	0.56 fledglings	
Tawny Owl	42	59	Linear increase	1.39 fledglings	1.96 fledglings	0.57 fledglings	Nocturnal species
Pied Wagtail	42	82	Linear increase	3.01 fledglings	3.61 fledglings	0.6 fledglings	
Carrion Crow	42	39	Curvilinear	1.71 fledglings	2.32 fledglings	0.61 fledglings	Includes Hooded Crow
Kestrel	42	41	Curvilinear	2.91 fledglings	3.57 fledglings	0.66 fledglings	
Grey Wagtail	42	54	Linear increase	2.61 fledglings	3.34 fledglings	0.73 fledglings	
Jackdaw	42	54	Linear increase	1.73 fledglings	2.56 fledglings	0.83 fledglings	
Starling	42	114	Curvilinear	2.38 fledglings	3.22 fledglings	0.84 fledglings	
Merlin	42	22	Linear increase	2.44 fledglings	3.36 fledglings	0.92 fledglings	Small sample
Barn Owl	42	28	Linear increase	2.32 fledglings	3.24 fledglings	0.92 fledglings	Small sample
Wheatear	42	16	Linear increase	3.5 fledglings	4.43 fledglings	0.93 fledglings	Small sample
Dipper	42	80	Curvilinear	2.06 fledglings	3.09 fledglings	1.03 fledglings	
Tree Sparrow	42	238	Linear increase	2.73 fledglings	3.86 fledglings	1.13 fledglings	

Species	Period (yrs)	Mean annual sample	Trend	Predicted in first year	Predicted in last year	Change	Comment
Magpie	42	42	Curvilinear	1.07 fledglings	2.23 fledglings	1.16 fledglings	
Nuthatch	42	51	Curvilinear	3.4 fledglings	4.78 fledglings	1.38 fledglings	
Redstart	42	53	Linear increase	3.72 fledglings	5.37 fledglings	1.65 fledglings	

See Key to species texts for help with interpretation

There is increasing evidence that organisms at lower trophic levels are responding to climatic change more rapidly than those towards the top of the food chain (Visser & Both 2005, Thackeray *et al.* 2010). Resulting mismatches in the timing of food availability and of offspring food demand, referred to as phenological disjunction, can have severe impacts on breeding success and ultimately on population trends (Both *et al.* 2009, but see Reed *et al.* 2012). Long-distance migrants are thought to be particularly susceptible, due to their later arrival on the breeding grounds and the energetic demands of their journey northwards, which may constrain their ability to advance their laying dates (Rubolini *et al.* 2010, Ockendon *et al.* 2012, but see Goodenough *et al.* 2011), and this mechanism could therefore underpin the productivity declines detected for Nightjar and Willow Warbler. In addition, recent declines in the number of aerial insects (Shortall *et al.* 2009), particularly moths (Conrad *et al.* 2006, Fox 2013), have been reported across the UK and these may also impact on the productivity of nesting attempts of Nightjar and Willow Warbler by reducing food availability for both parents and offspring. Both species may also be experiencing negative impacts of climate change in their African wintering grounds, where reduced rainfall could lead to a fall in insect abundance and a subsequent loss of condition, resulting in a lower reproductive output in the following spring (Saino *et al.* 2004, 2011, Schaub *et al.* 2011).

Woodland passerines that depend on short-lived peaks in the availability of larval Lepidoptera to provide food for their nestlings may also suffer reduced productivity as a result of climate-induced changes in phenology. As springs have become warmer, oak leafing dates have advanced, a shift matched by caterpillars (Buse *et al.* 1999) but not by tits (Visser *et al.* 1998) or flycatchers (Both *et al.* 2009). Contrary to predictions, the NRS data set provides no evidence for any change in Pied Flycatcher productivity at a national scale. A recent study in the Netherlands found that responses to disjunction may vary spatially, with the negative effects exacerbated in more seasonal habitats, where the window of prey availability is smaller (Both *et al.* 2010), and regional variation in breeding success at sites across the UK is currently being investigated. Similarly, the results presented in this report provide no evidence that Great Tit productivity has changed, although that of Chaffinch, another woodland insectivore heavily reliant on moth larvae to provision its offspring, has decreased significantly.

The reduction in Chaffinch breeding success is primarily due to increasing failure rates during incubation. Declining nest survival at either the egg or chick stage is also implicated in the productivity declines of Nightjar, Tree Pipit, Willow Warbler, Treecreeper and Bullfinch. Although there is good evidence to suggest that potential nest predators such as corvids, Sparrowhawks and grey squirrels are all increasing in number and that these species may have a negative influence on avian abundance at a very localised scale (e.g. Groom 1993, Stoate & Szczur 2001, 2006), previous studies have failed to find any evidence of a significant impact at a national scale (Gooch *et al.*1991, Thomson *et al.* 1998, Chamberlain *et al.* 2009, Newson *et al.* 2009, Vögeli *et al.* 2011).

Increasing human activity in the countryside, resulting from a growing population, could increase disturbance levels, which could in turn influence the rates of predation and desertion. An investigation of Nightjar productivity suggested that nest failure is most likely in areas heavily frequented by walkers and dogs (Langston *et al.* 2007) and a recent review of impacts of recreational disturbance found breeding success to be adversely affected by human activity levels in 28 out of 33 papers cited (Steven *et al.* 2011). Further research into the impacts of nest predators on population trajectories, at a variety of spatial scales, is urgently required.

Increased grazing pressure by deer, numbers of which are increasing rapidly in many areas of the UK (Newson *et al.* 2012), has been identified as a possible driver of population declines, the removal of the herb and shrub layer potentially reducing the availability of both food and well-concealed nesting sites (Fuller *et al.* 2005). Interactions between plants and herbivores may be further mediated by climatic change, the resultant reduction in habitat availability leading to increased inter-specific competition and therefore to a drop in fledgling output (Auer & Martin 2013). This could have contributed to the observed declines in productivity of both Willow Warbler and Bullfinch. A recent study using BTO/JNCC/RSPB Breeding Bird Survey deer data indicated that declines in Willow Warbler were most pronounced in areas where Reeves's muntjac had increased at the fastest rate (Newson *et al.* 2012), in agreement with a previous study looking at regional variation in Willow Warbler population trends (Morrison *et al.* 2010). While a similar negative relationship was identified for Bullfinch, it was not statistically significant. The causes of decline in the breeding success of this species, and indeed the drivers of its population decline, are still unclear despite a significant number of demographic studies (Siriwardena *et al.* 1998a, 1999, 2000b, 2001, Proffitt *et al.* 2004).

As Chaffinch and Coal Tit have both exhibited concurrent declines in productivity and increases in population size, we cannot currently exclude the possibility that increasing levels of intraspecific competition are reducing reproductive output (Greenwood & Baillie 2008).

FPBA has increased significantly over the last 42 years for 29 species, across a wide range of taxonomic groups (Table D1). Population trends are also upward for 14 of these species, including raptors (Sparrowhawk, Buzzard, Merlin, Barn Owl), pigeons (Stock Dove, Woodpigeon, Collared Dove), corvids (Magpie, Jackdaw, Carrion Crow), and some small passerines (Reed Warbler, Nuthatch, Robin and Pied Wagtail). It is therefore possible that increasing productivity has contributed to the population growth exhibited by these species over recent decades.

Conversely, 15 species (Kestrel, Tawny Owl, Skylark, Sedge Warbler, Starling, Dipper, Blackbird, Redstart, Wheatear, Dunnock, House Sparrow, Tree Sparrow, Grey Wagtail, Meadow Pipit and Yellowhammer), have declined in number as FPBA has increased, suggesting that a density-dependent reduction in intraspecific competition may have enabled breeding success to rise.

Changes in productivity from Constant Effort Sites ringing data

The CES started monitoring populations in 1983, so the changes in productivity (Table D2) cover roughly half the period of the Nest Record Scheme results. The CES data set is unique in providing relative measures of adult abundance and productivity from the same set of sites in wetland and scrub habitats. While the NRS data set monitors the productivity of individual nesting attempts, the proportion of juveniles in the CES catch provides a relative measure of annual variation in productivity that integrates the effects of the number of fledglings produced per attempt, number of nesting attempts and immediate post-fledging survival. Use of these two techniques in combination provides a powerful method of determining which factors are responsible for observed declines in recruitment of young birds into the breeding population.

Table D2 Changes in productivity indices (percentage juveniles) for CES, 1984-2010, calculated from smoothed trend

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Comment
Goldfinch	25	37	-79	-92	-53	
Reed Bunting	25	63	-56	-70	-32	

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Comment
Garden Warbler	25	79	-53	-69	-28	
Sedge Warbler	25	73	-49	-65	-26	
Blue Tit	25	105	-42	-56	-27	
Blackbird	25	103	-38	-50	-20	
Blackcap	25	100	-27	-44	-12	
Song Thrush	25	92	-27	-47	-1	
Reed Warbler	25	63	44	9	85	
Chaffinch	25	86	90	24	189	

See Key to species texts for help with interpretation

Overall, eight species exhibit significant declines in the proportion of juveniles captured (Table D2). The apparent productivity of Garden Warbler, Goldfinch and Reed Bunting has fallen by more than 50% over the last 25 years, while Blackcap, Sedge Warbler, Song Thrush, Blackbird and Blue Tit show reductions in relative productivity of between 25% and 50%.

Although three of these species, Song Thrush, Blackbird and Sedge Warbler, have experienced significant population declines, either on CES sites or more widely (based on CBC/BBS figures), previous analyses suggest that falling survival rates are likely to have been a more important contributor to population changes than reduced productivity (Peach *et al.* 1991, 1995a, 1999, Robinson *et al.* 2004, 2010, Baillie *et al.* 2009). Reed Bunting numbers also fell due to declining survival rates, but these have since risen again; falling productivity in recent years may now be preventing a population from recovery (Peach *et al.* 1999).

For species such as Blackcap, Goldfinch and Blue Tit, where population increase has occurred, reductions in productivity may be driven by density-dependent processes, whereby increased competition for resources in an expanding population reduces the mean breeding success per pair.

Two species, Chaffinch and Reed Warbler, have displayed a significant increase in productivity. In the case of Reed Warbler, the NRS dataset also indicates a significant increase in breeding success over this period. The marked difference between the Chaffinch CES trend and the decline in productivity identified by the NRS data set requires further investigation, but it may be that changes in post-juvenile survival over time are responsible.

Changes in average laying dates from Nest Record Scheme data

Over the past 25 years, many species have exhibited a trend towards progressively earlier clutch initiation (Crick *et al.* 1997) with laying dates showing curvilinear responses over the past 50 years as spring temperatures have cooled and then warmed (Crick & Sparks 1999). Table D3 confirms that, since the mid 1960s, the majority of species exhibiting significant trends show an advancement of laying dates rather than a delay. Thus 42 species are laying between one and 31 days earlier, on average, than they were 45 years ago. It is interesting to note that, while the results of previous studies predict laying-date advancement to be more constrained in long-distance migrants (Both *et al.* 2009, Rubolini *et al.* 2010), the magnitude of the laying-date shift in both Pied Flycatcher and Redstart (11 days and 13 days respectively), is greater than that displayed by many resident species. However, the mean laying date of the migrant species is still approximately a fortnight later than that of common residents such as Blue Tit and Great Tit. No taxonomic or ecological associations are apparent and a wide range of species demonstrate trends of a similar magnitude (Crick *et al.* 1997).

Table D3 Significant trends in laying date measured between 1968 and 2010

Species	Period (yrs)	Mean annual sample	Trend	Predicted in first year	Predicted in last year	Change	Comment
Magpie	42	32	Linear decline	Apr 24	Mar 24	-31 days	
Long-tailed Tit	42	51	Linear decline	Apr 21	Apr 5	-16 days	
Greenfinch	42	92	Linear decline	May 25	May 9	-16 days	
Goldfinch	42	23	Curvilinear	Jun 5	May 22	-14 days	Small sample
Redstart	42	63	Curvilinear	May 21	May 8	-13 days	
Chiffchaff	42	55	Linear decline	May 16	May 3	-13 days	
Coal Tit	42	45	Linear decline	May 3	Apr 20	-13 days	
Carrion Crow	42	29	Curvilinear	Apr 17	Apr 4	-13 days	Includes Hooded Crow
Nuthatch	42	30	Linear decline	May 2	Apr 20	-12 days	Small sample
Dipper	42	64	Linear decline	Apr 19	Apr 8	-11 days	
Blackcap	42	40	Curvilinear	May 21	May 10	-11 days	
Pied Flycatcher	42	430	Linear decline	May 21	May 10	-11 days	
Blue Tit	42	464	Linear decline	May 4	Apr 23	-11 days	
Great Tit	42	353	Linear decline	May 5	Apr 24	-11 days	
Treecreeper	42	13	Linear decline	May 7	Apr 26	-11 days	Small sample
Corn Bunting	42	16	Linear decline	Jun 26	Jun 15	-11 days	Small sample
Marsh Tit	42	14	Linear decline	Apr 28	Apr 18	-10 days	Small sample
Chaffinch	42	107	Linear decline	May 12	May 2	-10 days	
Peregrine	42	10	Linear decline	Apr 13	Apr 4	-9 days	Small sample
Stonechat	42	40	Curvilinear	May 3	Apr 24	-9 days	
Sedge Warbler	42	47	Curvilinear	May 29	May 20	-9 days	
Reed Warbler	42	198	Curvilinear	Jun 17	Jun 8	-9 days	

Species	Period (yrs)	Mean annual sample	Trend	Predicted in first year	Predicted in last year	Change	Comment
Whitethroat	42	20	Curvilinear	May 27	May 18	-9 days	Small sample
Swallow	42	200	Curvilinear	Jun 19	Jun 11	-8 days	
Tree Pipit	42	20	Curvilinear	May 27	May 19	-8 days	Small sample
Robin	42	132	Linear decline	Apr 28	Apr 20	-8 days	
House Sparrow	42	63	Linear decline	May 25	May 17	-8 days	
Kestrel	42	23	Linear decline	May 4	Apr 27	-7 days	Small sample
Moorhen	42	70	Linear decline	May 10	May 3	-7 days	
Oystercatcher	42	49	Linear decline	May 16	May 9	-7 days	
Ring Ouzel	42	21	Linear decline	May 15	May 8	-7 days	Small sample
Garden Warbler	42	22	Linear decline	May 28	May 21	-7 days	Small sample
Willow Warbler	42	84	Linear decline	May 20	May 13	-7 days	
Starling	42	84	Curvilinear	Apr 27	Apr 20	-7 days	
Grey Wagtail	42	60	Linear decline	May 8	May 2	-6 days	
Wren	42	87	Linear decline	May 15	May 9	-6 days	
Wood Warbler	42	34	Linear decline	May 26	May 20	-6 days	
Jackdaw	42	27	Curvilinear	Apr 23	Apr 17	-6 days	Small sample
Whinchat	42	27	Linear decline	May 30	May 25	-5 days	Small sample
Tree Sparrow	42	266	Linear decline	May 28	May 24	-4 days	
Meadow Pipit	42	37	Curvilinear	May 19	May 16	-3 days	
Pied Wagtail	42	81	Curvilinear	May 18	May 17	-1 days	
Blackbird	42	223	Curvilinear	Apr 23	Apr 26	3 days	
Yellowhammer	42	26	Linear increase	May 31	Jun 8	8 days	Small sample
Skylark	42	19	Curvilinear	May 25	Jun 3	9 days	Small sample
Bullfinch	42	34	Linear increase	May 25	Jun 3	9 days	
Woodpigeon	42	83	Linear increase	Jun 1	Jun 22	21 days	

See Key to species texts for help with interpretation

The significance of the changes in phenology for breeding performance is poorly understood but has stimulated a large number of scientific studies, including several ongoing projects at BTO. Earlier average laying may be beneficial for birds because earlier fledging is often related to improved survival to the following year – thus early-nesting parents have an increased chance of having their offspring recruited into the next generation (Visser *et al.* 1998). However, the timing of leaf emergence and the speed of caterpillar development is also changing under increased temperatures (Buse *et al.* 1999, Visser & Holleman 2001) and the results of several recent studies have suggested that some birds may be unable to advance their breeding sufficiently to match phenological changes in their food supply, such that later-nesting birds are suffering from poorer productivity. Both *et al.* (2006) demonstrated that mismatches between periods of food availability and chick demand can affect abundance in Dutch Pied Flycatcher populations, with those demonstrating the largest mismatches between arrival in spring and peak caterpillar abundance exhibiting the greatest declines. As a consequence of climate change there may be an increasing mismatch between predator activities and the availability of their food supplies at different trophic levels within ecosystems (Both *et al.* 2009). Recent studies in the Netherlands have suggested that the magnitude of disjunction may be mediated by habitat type, with species in more seasonal habitats at greatest risk of negative impacts on productivity (Both *et al.* 2010). The conservation significance of such phenological disjunction remains an active research area with potentially important policy implications for conservation.

Only six species exhibit significant trends towards later laying. A recent collaboration between BTO and Aberdeen University, using NRS data, identified an increase in the frequency of repeat brooding in Yellowhammers (Cornulier *et al.* 2009) which, as mean laying dates are calculated across all broods, would result in the observed shift. Increased production of repeat broods could be stimulated by climatic amelioration, with later nests being more productive in warmer conditions, or by movement of birds away from farmland and into habitats where they are released from constraints on multiple brooding. Previous research into multiple brooding in Skylark populations has demonstrated that increased planting of autumn-sown cereals has restricted the potential for repeat nesting attempts (Chamberlain & Siriwardena 2000), but this species may also increasingly have moved to alternative habitats.

It is likely that the laying dates of the majority of those species that do not show a significant trend in timing of breeding are also related to weather, but that their weather-mediated cues do not show any trend over time (Crick & Sparks 1999).

Conclusion

We trust that this report will be useful as a ready source of information for conservation practitioners, and as a source of information for those involved in more strategic conservation policy-making, as well as to the general student of bird populations. The information presented here is a summary of a very extensive and much more detailed data set held by the BTO. This report provides a relatively simple and concise overview of the way in which populations are changing, suggesting areas where further research is required or where conservation action needs to be taken.

Alerts are raised as a result of declines in the population sizes of a considerable number of species. These alerts will help conservation organisations to prioritise future conservation action, alongside the Birds of Conservation Concern list (Eaton *et al.* 2009) and other information.

The information concerning demographic factors contained in this report will also help conservation organisations to target their resources more effectively. For declining species of conservation importance, declines in breeding performance may indicate that conservation action should be targeted towards the breeding season; such responses may sometimes be masked, however, by density-dependent improvements in breeding success as the population declines (Green 1999). The lack of a decline in breeding performance may suggest that factors other than nesting success, such as loss of habitat or changes in survival rates are more likely to be influencing the observed population declines. A report of this kind can provide only an initial summary of such information, and a full assessment of the population dynamics of a declining species will generally require more detailed investigations (e.g. Peach *et al.* 1999, Freeman & Crick 2003, Robinson *et al.* 2004).

Finally, we hope that users of this report will provide feedback on how it can be improved. We would welcome comments on any aspect of this report, as they will help us to produce a better and more useful next edition.

Email your comments to: john.marchant@bto.org

Utilities

The tables of population change that appear on the species pages are species-based selections from a single unified table, with data newly calculated for this edition of the report. A number of additional selections from this table, by scheme and time-period, are presented in the Summary tables section. Using the table generator, you can interrogate the master table by data source or time-period, for all species or for your own selection of species, and choose how your extract will be sorted.

This edition of the Bird Trends report is the 14th in a series that began in 1997. Citations for previous editions are listed under Previous reports. Links are given to the full text of previous reports, where still available on line.

Previous reports

Previous reports in this series are listed, from the most recent to the earliest. The first two (Crick *et al.* 1997, 1998) were produced as paper reports, but all subsequent reports are purely web-based and url addresses must be included in their citations.

Note that www.bto.org/about-birds/bird-trends will always link to the home page of the most recent version of this report. Web addresses including a year (e.g. .../birdtrends/2011/...) may lead you to earlier reports in the series, now superseded.

BirdTrends 2011: trends in numbers and demography for UK breeding birds

Baillie, S.R., Marchant, J.H., Leech, D.I., Renwick, A.R., Eglington, S.M., Joys, A.C., Noble, D.G., Barimore, C., Conway, G.J., Downie, I.S., Risely, K. & Robinson, R.A. (2012) *BirdTrends 2011*. Research Report 609. BTO, Thetford. (www.bto.org/about-birds/birdtrends/2011)

Breeding Birds in the Wider Countryside: their conservation status 2010

Baillie, S.R., Marchant, J.H., Leech, D.I., Renwick, A.R., Joys, A.C., Noble, D.G., Barimore, C., Conway, G.J., Downie, I.S., Risely, K. & Robinson, R.A. (2010) *Breeding Birds in the Wider Countryside: their conservation status 2010.* Research Report 565. BTO, Thetford. (www.bto.org/birdtrends2010)

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Clicking on reference links within the text of this report will bring you to its full details in this section: the reference sought will be at the very top of your view.

In some cases, we provide an onward link either to an abstract or, where it is freely available, to the full text of the listed publication. Alternatively, your own web search will often take you to the summary of an article and the opportunity to purchase the text in full. The doi (digital object identifier), where given, is a useful key to copy to a search engine.

Most of the listed publications are available in printed form to BTO members and other bona fide researchers through the Chris Mead Library at BTO headquarters in Thetford.

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Mute Swan

Cygnus olor

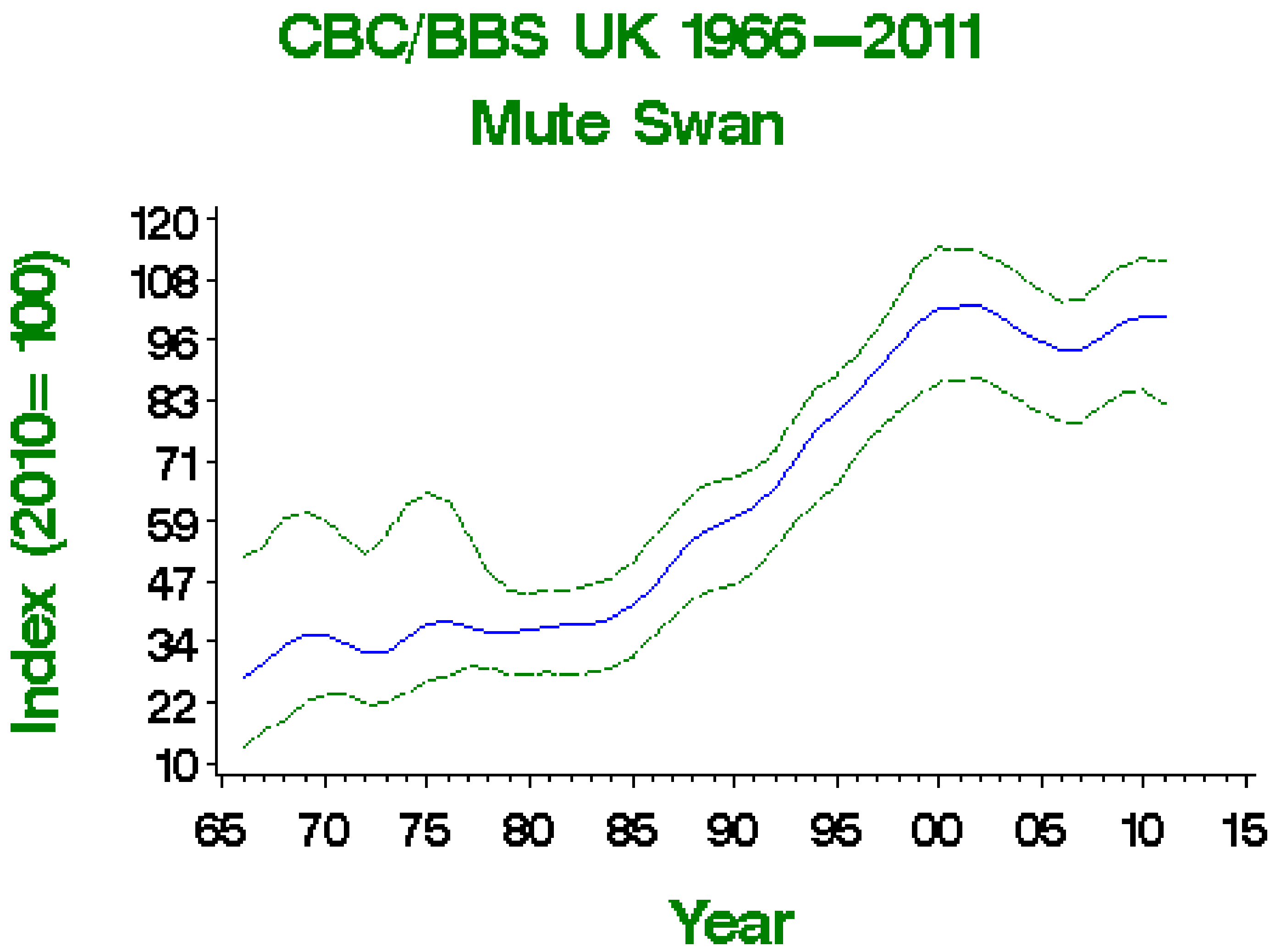
Key facts

Conservation listings:	Europe: no SPEC category (concentrated in Europe, conservation status favourable) (BiE04) UK: green (BoCC3)
Long-term trend:	UK, England: rapid increase
Population size:	6,400 (5,800-7,000) pairs in 2009 (APEP13: 2002 estimate (Ward et al. 2007) updated using BBS trend); 79,000 individuals in winter in 2004-09 (Musgrove et al. 2011)

Migrant status:	Resident
Nesting habitat:	Ground nester
Primary breeding habitat:	Wetland
Secondary breeding habitat:	
Breeding diet:	Vegetation
Winter diet:	Vegetation

Status summary

Mute Swan populations, which had been fairly stable since the 1960s, increased progressively from the mid 1980s to around 2000, when a new plateau was reached. Waterways, likely to be a preferred habitat for breeding swans, show a more moderate rate of increase than CBC/BBS. Winter trends as measured by WeBS have shown a parallel upturn, with little change in Britain after 2000 (Holt et al. 2012a). After a spell on the amber list from 2002, for reasons unconnected with its UK trend, the species is now green listed once more. There has been widespread moderate increase across Europe since 1980 (PECBMS 2012a).



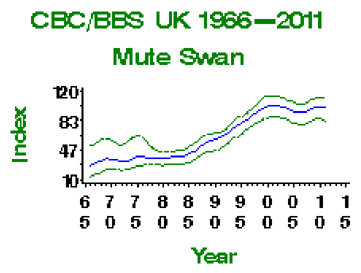
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

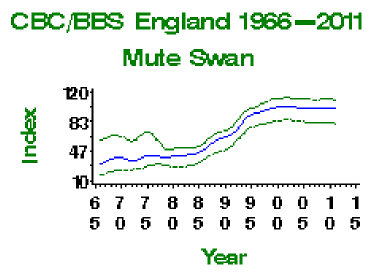
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	103	233	49	617		
	25	1985-2010	165	138	89	237		
	10	2000-2010	281	-2	-16	13		
	5	2005-2010	315	5	-5	14		
CBC/BBS England	43	1967-2010	89	197	27	535		Small CBC sample
	25	1985-2010	141	122	71	250		
	10	2000-2010	239	-1	-16	11		
	5	2005-2010	270	0	-14	7		
WBS/WBBS waterways	35	1975-2010	78	86	35	172		
	25	1985-2010	95	67	30	115		
	10	2000-2010	146	1	-16	18		
	5	2005-2010	145	-5	-17	10		
BBS UK	15	1995-2010	242	23	1	53		
	10	2000-2010	278	-1	-19	13		
	5	2005-2010	313	5	-7	15		
BBS England	15	1995-2010	207	6	-12	20		
	10	2000-2010	236	0	-17	13		
	5	2005-2010	269	0	-12	5		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

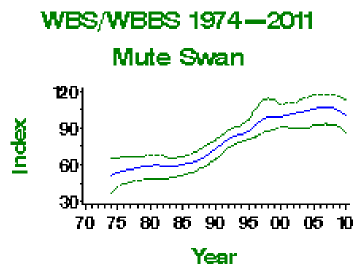
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



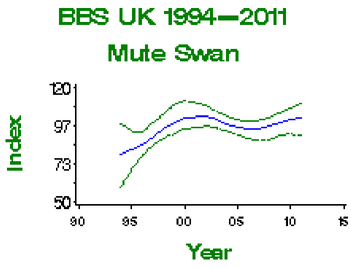
CBC/BBS UK graph



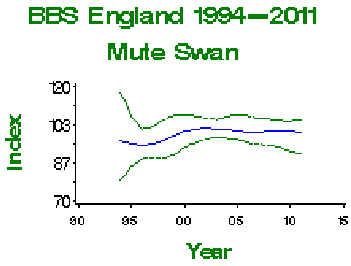
CBC/BBS England graph



WBS/WBBS waterways graph

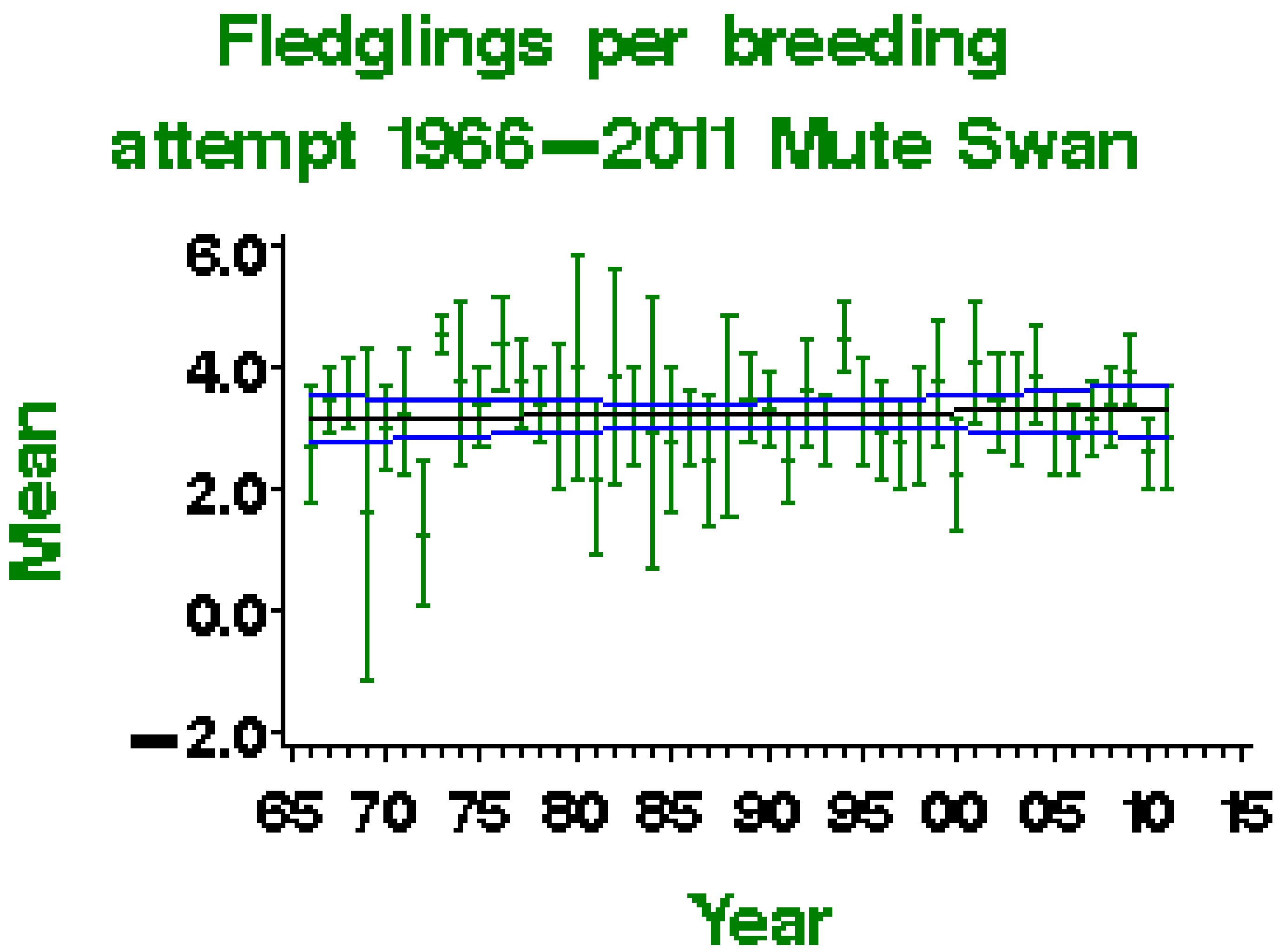


BBS UK graph

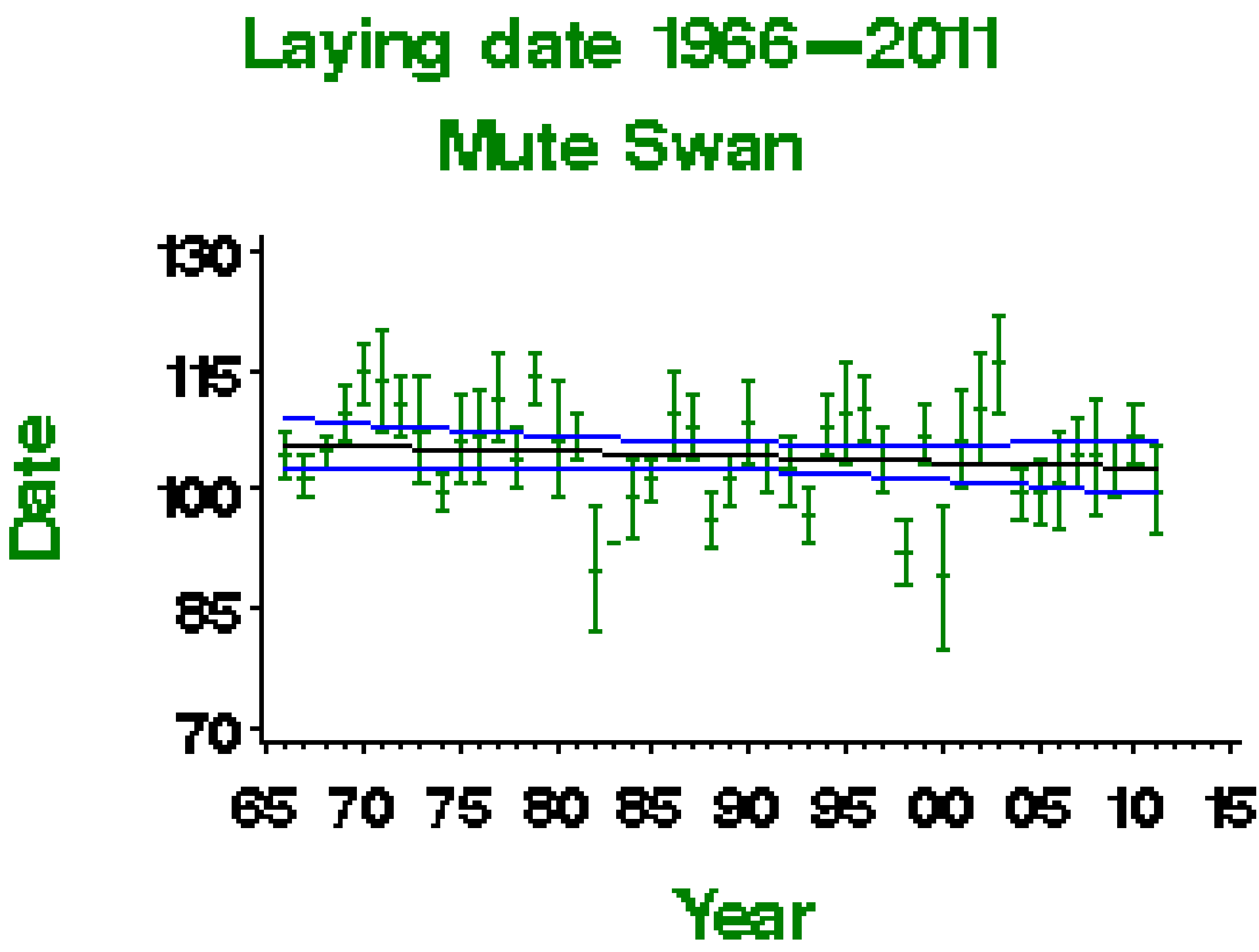


BBS England graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

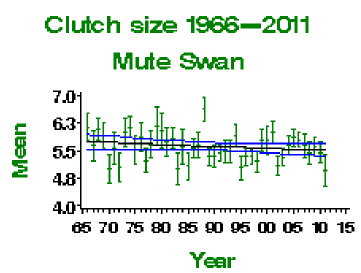


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

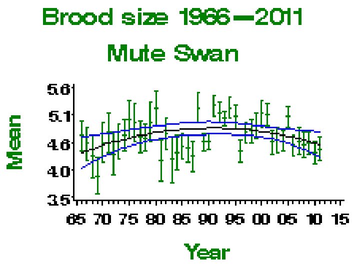
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	34	None					
Clutch size	42	1968-2010	31	None					
Brood size	42	1968-2010	67	Curvilinear	4.42 chicks	4.54 chicks	2.7%		
Nest failure rate at egg stage	42	1968-2010	38	None					
Nest failure rate at chick stage	42	1968-2010	42	None					
Laying date	42	1968-2010	17	None			0 days		Small sample

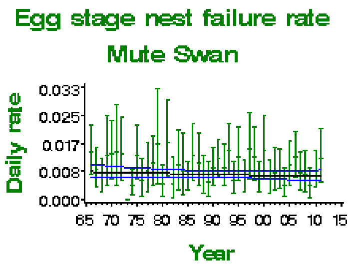
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



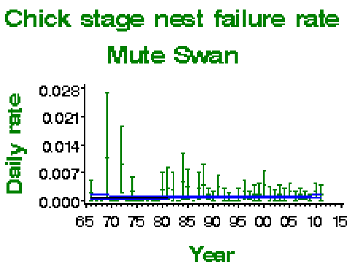
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

Causes of change

The increase in this species has been attributed to the banning of lead weights for fishing and the positive implications of this on survival. Milder winters have also been a factor, increasing overwinter survival and having knock-on effects on breeding success.

Change factor	Primary driver	Secondary driver
Demographic	Increased survival	Increased breeding success
Ecological	Other	Climate change

Further information on causes of change

The main hypothesis relating to the factors causing the increase in this species concerns the use of lead as fishing weights (Rowell & Spray 2004, Ward et al. 2007). In the late 1970s lead poisoning was shown to be the largest single cause of death among Mute Swans in England, accounting for the deaths of 3,000-3,500 birds annually (Kirby et al. 1994). There is good evidence showing that lead contamination of Mute Swans in England caused local population declines during the late 1970s and 1980s (Blus 1994, Birkhead & Perrins 1985). The increase in the British Mute Swan population seen between the 1983 and 1990 censuses can thus be explained partly by the ban on the use of lead weights in fishing imposed by the Water Authorities in 1987 (Rowell & Spray 2004). There is no evidence to suggest that lead poisoning was ever a problem in Scotland (e.g. Brown & Brown 1984).

A second, not mutually exclusive, hypothesis is that warmer winter weather has benefited this species. Deaths during the winter due to poor weather are an important cause of mortality in many areas (Spray 1981, Perrins & Sears 1991) and a run of mild winters is likely to have reduced this (Rowell & Spray 2004). Mild winters are not only associated with low mortality but are also followed by high reproductive output (Delany et al. 1992) which has also contributed to the increase in the Mute Swan population. A study examining five years' data on breeding biology found that winter temperature was one of the factors significantly affecting the date of laying, which in turn was related to clutch size, which in itself was the most significant factor determining the number of cygnets fledged (Birkhead et al. 1983), hence demonstrating an effect on breeding performance. Esselink & Beekman (1991) have also shown that mild winters are not only associated with low mortality but are also followed by high reproductive output be enabling adults attain peak body condition. This may have been particularly important in Scotland.

Whilst the recovery of the British Mute Swan population may in large part be attributed to the reduced incidence of lead poisoning, locally other factors may have had an equal or more important contribution to the observed changes (Ward et al. 2007). Recent years have also seen an increase in the availability of suitable breeding habitats, in the form of the large numbers of gravel pits and ponds that have been created. Improvements to the water quality of rivers and canals, as a result of efforts to reduce pollution, may have also helped the species (Coleman et al. 2001, Rowell & Spray 2004). The number and activity of Swan Rescue Centres may also have an effect on the Mute Swan population size (Delany et al. 1992, Perrins & Martin 1999), although there is little documented evidence to support this. Other factors affecting local populations include increased protection of nesting birds; in an English Midlands study area, this was considered a key factor in the reversal of the 1960s and 1970s decline (Coleman et al. 2001).

In Scotland (and presumably elsewhere), the increased autumn sowing of cereals has improved the winter food supply for swans, enabling a higher proportion of birds to survive the winter (Delany et al. 1992, Ward et al. 2007), although there are no specific analyses to support this.

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

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Greylag Goose

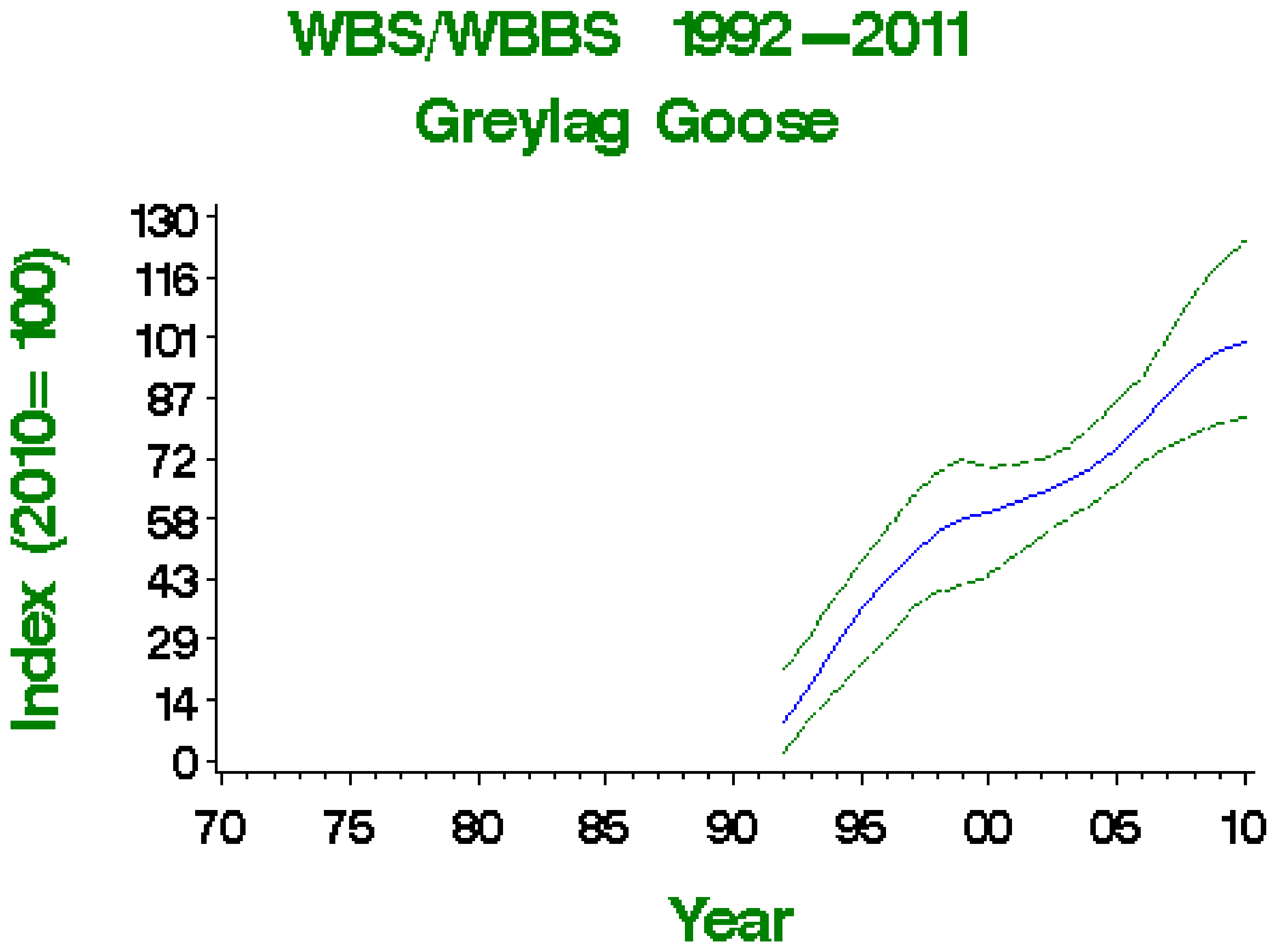
Anser anser

Key facts

Conservation listings:	Europe: no SPEC category (favourable conservation status in Europe, not concentrated in Europe) (BiE04) UK: not listed (re-established population); amber (localised NW Scottish population); amber (in winter, localised and >20% of NW European Flyway population) (BoCC3)
Long-term trend:	UK waterways: rapid increase
Population size:	46,000 pairs in 2004-08 (APEP13)

Status summary

Apart from an indigenous population in northwest Scotland and the Western Isles, and winter visitors mainly from Iceland, the Greylag Goose is a re-established species throughout the UK. Re-established Greylags increased very rapidly, at a rate estimated at 12% per annum in southern Britain between the 1988-91 Atlas period and 1999 (Rehfisch et al. 2002). This equates across Britain to 170%, or 9.4% per annum, in the period to 2000 (Austinet al. 2007). In Scotland, the native population has grown at an annual rate of 11.7% since 1997 and the re-established birds at 9.7% per annum since 1989 (Mitchell et al. 2011). It has become impossible to distinguish native from re-established populations and they are best now treated as a single unit (Mitchell et al. 2012). The WBS sample became large enough for annual monitoring in 1992, since when further steep increase has been recorded along linear waterways with no sign yet of levelling off. Annual breeding-season monitoring in a wider range of habitats through BBS has shown similar strong increases. Winter counts of resident birds have increased rapidly since the late 1960s (Holt et al. 2012a).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

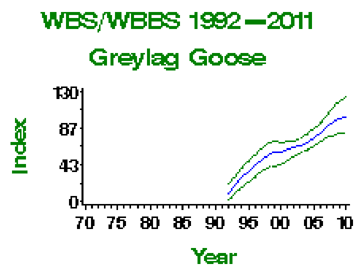
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
WBS/WBBS waterways	17	1993-2010	39	436	175	1116		
	10	2000-2010	56	69	9	180		
	5	2005-2010	61	34	3	77		

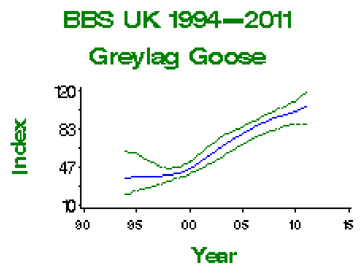
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	15	1995-2010	169	168	42	374		
	10	2000-2010	211	126	84	161		
	5	2005-2010	262	27	10	57		
BBS England	15	1995-2010	139	234	127	450		
	10	2000-2010	175	128	72	187		
	5	2005-2010	219	59	35	81		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

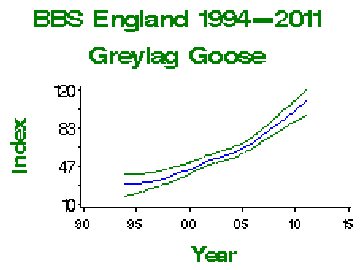
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



WBS/WBBS waterways graph



BBS UK graph



BBS England graph

Demographic trends

Productivity and survival trends for this species are not currently produced by BTO

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Canada Goose

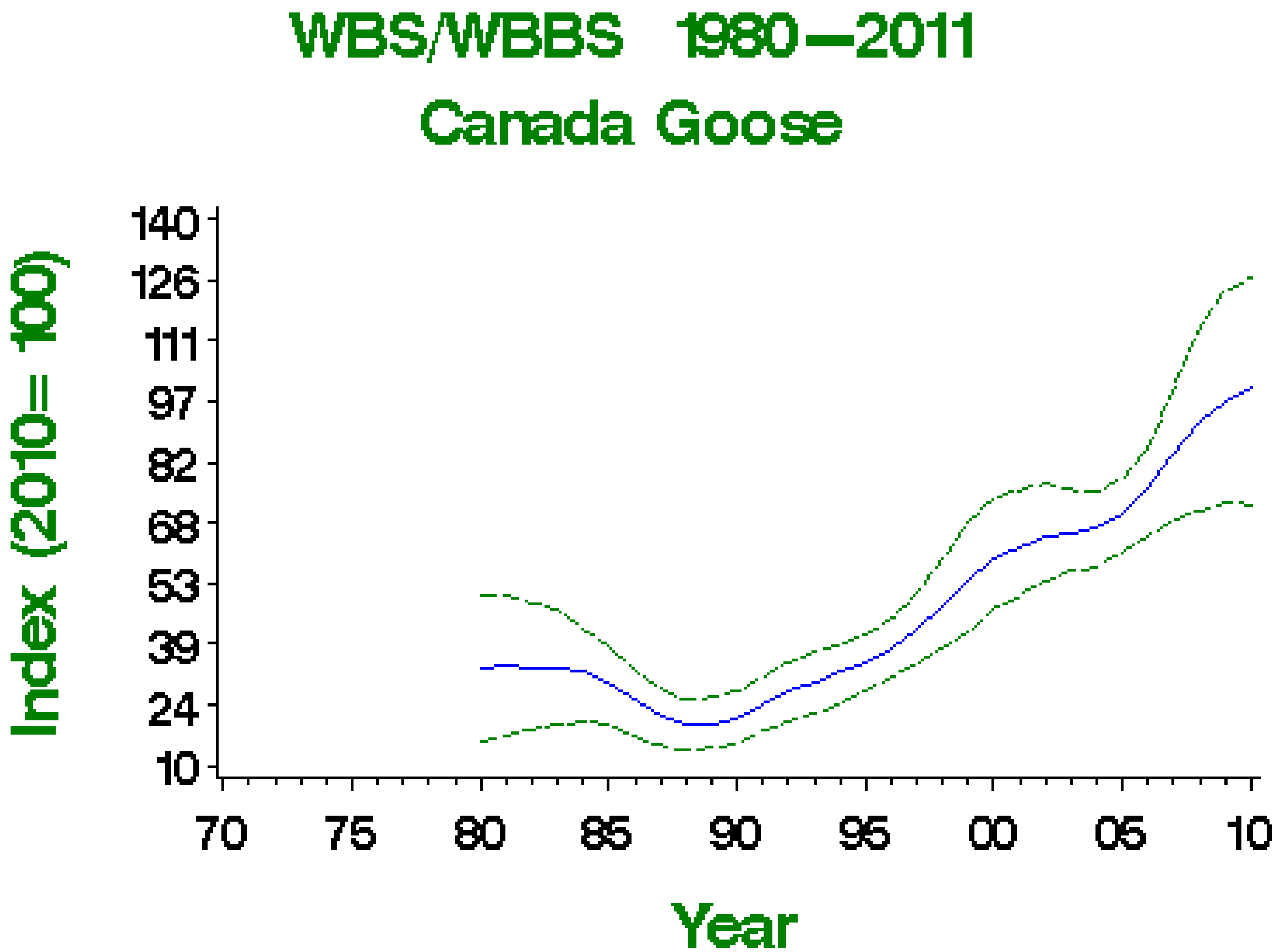
Branta canadensis

Key facts

Conservation listings:	Europe: no SPEC category (favourable conservation status in Europe, not concentrated in Europe) (BiE04) UK: not listed (introduced)
Long-term trend:	UK waterways: rapid increase
Population size:	62,000 pairs in 2004-08 (APEP13)

Status summary

Canada Geese were first introduced to English parkland around 1665 but have expanded hugely in range and numbers following translocations in the 1950s and 1960s. They increased rapidly, at a rate estimated at 9.3% per annum in Britain between the 1988-91 Atlas period and 2000, with no sign of any slowing in the rate of increase (Austin et al. 2007). Most of this increase, amounting to 166% during that decade alone, has been in areas previously with low goose densities. The WBS sample became large enough for annual monitoring in 1980, since when further, apparently accelerating, increase has occurred on linear waterways. Annual breeding-season monitoring in a wider range of habitats through BBS has shown similar strong increases in England and in the UK as a whole. Winter monitoring by WeBS shows a strong long-term increase, but with little change since about 2001 (Holt et al. 2012a). The economic, social and environmental impacts of rapidly expanding, non-native Canada Goose populations are of growing conservation concern across Europe.



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
WBS/WBBS waterways	29	1981-2010	64	197	49	629		
	25	1985-2010	71	236	86	557		
	10	2000-2010	119	70	1	180		

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	5	2005-2010	124	44	6	83		
BBS UK	15	1995-2010	455	73	50	103		
	10	2000-2010	535	32	15	47		
	5	2005-2010	609	-9	-20	2		
BBS England	15	1995-2010	423	63	37	95		
	10	2000-2010	494	28	10	44		
	5	2005-2010	561	-10	-23	1		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

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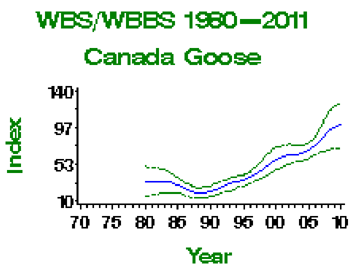
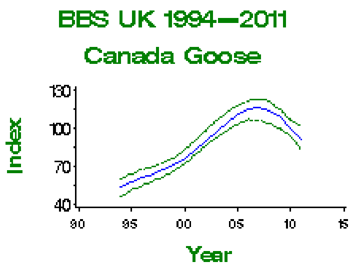
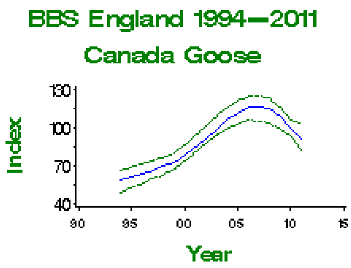


WBS/WBBS waterways graph



BBS UK graph



BBS England graph

Demographic trends

Productivity and survival trends for this species are not currently produced by BTO

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Shelduck

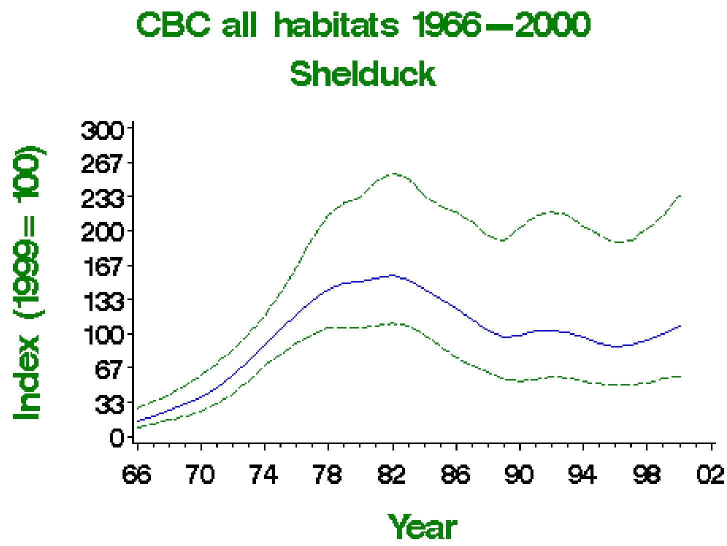
Tadorna tadorna

Key facts

Conservation listings:	Europe: no SPEC category (favourable conservation status in Europe, not concentrated in Europe) (BiE04) UK: amber (localised in winter, >20% of NW European population in winter) (BoCC3)
Long-term trend:	UK: probable increase
Population size:	15,000 pairs in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend for England)

Status summary

Shelducks occurred on relatively few CBC plots, most of which were close to a coast or an estuary, and it is unclear how well the CBC trend represented the UK breeding population. The CBC showed a substantial increase from the mid 1960s until the early 1980s, some decrease during the 1980s, and stability during the 1990s, although the wide confidence intervals provide scope for other interpretations. Population increase was associated with expansion of range, measured as an additional 20% of occupied 10-km squares in Britain between 1968-72 and 1988-91 (Gibbons et al. 1993). The UK winter Shelduck population rose during the 1960s and 1970s, alongside the rise in breeding numbers, but has been falling again since the mid 1990s (Holt et al. 2012a). The BBS index is affected by occasional large counts, and therefore its confidence intervals are again relatively wide. BBS results suggest increase since 1994, especially in England.



Smoothed population index, relative to an arbitrary 100 in 1999, with 85% confidence limits in green

Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC all habitats	31	1968-1999	18	300	94	787		Small CBC sample
	25	1974-1999	21	12	-40	118		Small CBC sample
	10	1989-1999	21	3	-21	40		Small CBC sample
	5	1994-1999	23	4	-18	39		
BBS UK	15	1995-2010	140	2	-41	51		
	10	2000-2010	151	26	-16	71		
	5	2005-2010	167	4	-16	17		
BBS England	15	1995-2010	116	35	-15	81		
	10	2000-2010	124	48	-8	95		
	5	2005-2010	138	16	-9	32		

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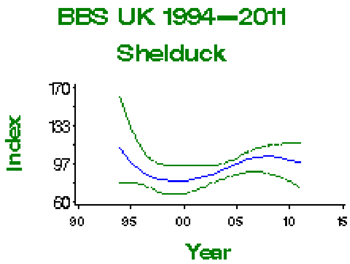
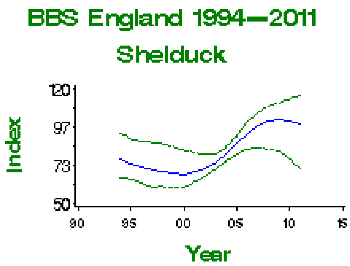
Smoothed population index, relative to an arbitrary 100 in 2009, with 85% confidence limits in green



Smoothed population index, relative to an arbitrary 100 in 2009, with 85% confidence limits in green



Smoothed population index, relative to an arbitrary 100 in 2009, with 85% confidence limits in green

Demographic trends

Productivity and survival trends for this species are not currently produced by BTO

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Mallard

Anas platyrhynchos

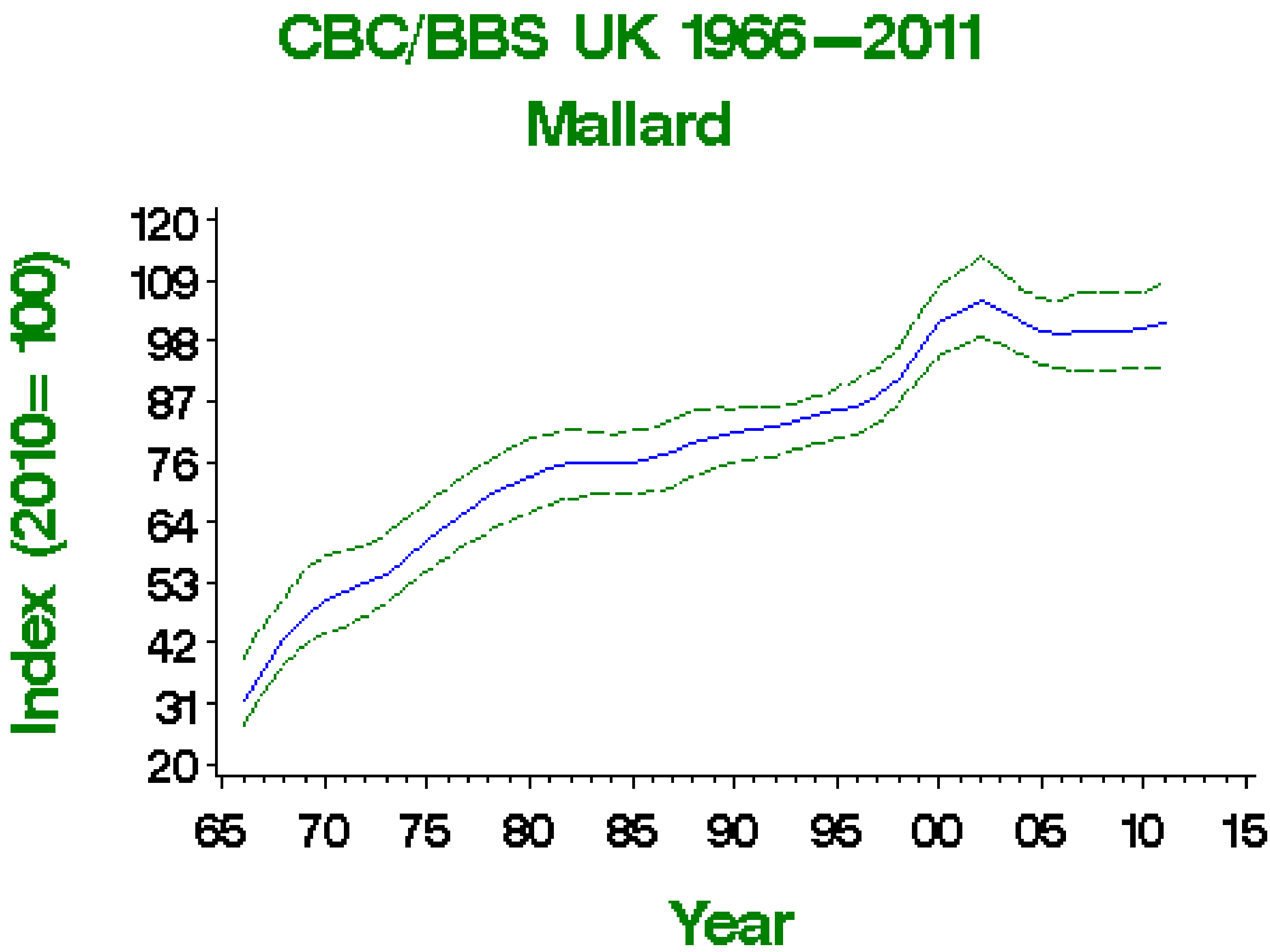
Key facts

Conservation listings:	Europe: no SPEC category (favourable conservation status in Europe, not concentrated in Europe) (BiE04) UK: amber (winter decline) (BoCC3)
Long-term trend:	UK, England: rapid increase
Population size:	61,000-146,000 pairs in 2009 (APEP13: 1988-91 estimate (APEP06) updated using CBC/BBS trend)

Migrant status:	Resident
Nesting habitat:	Ground nester
Primary breeding habitat:	Wetland
Secondary breeding habitat:	
Breeding diet:	Vegetation
Winter diet:	Vegetation

Status summary

The Mallard has increased steadily as a breeding bird in the UK since the 1960s, especially in England. The BBS Holt et al. 2012a). The species has recently been moved from the green to the amber list on the strength of this decline in the UK wintering population. There has been widespread moderate increase across Europe since 1980 but a moderate decrease in the period since 1990 (PECBMS 2012a).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	546	168	100	223		
	25	1985-2010	858	32	16	57		
	10	2000-2010	1442	-1	-7	5		
	5	2005-2010	1633	0	-4	5		
CBC/BBS England	43	1967-2010	461	204	132	283		
	25	1985-2010	724	42	26	68		
	10	2000-2010	1219	5	-1	12		
	5	2005-2010	1387	0	-4	5		
WBS/WBBS waterways	35	1975-2010	161	219	140	302		
	25	1985-2010	194	98	60	143		
	10	2000-2010	296	5	-3	13		
	5	2005-2010	294	6	1	10		
BBS UK	15	1995-2010	1252	20	11	28		
	10	2000-2010	1406	0	-7	5		
	5	2005-2010	1587	0	-6	5		
BBS England	15	1995-2010	1056	30	21	40		
	10	2000-2010	1191	7	1	13		
	5	2005-2010	1352	0	-5	4		
BBS Scotland	15	1995-2010	98	-11	-29	7		
	10	2000-2010	101	-30	-43	-16	>25	
	5	2005-2010	111	-4	-25	18		
BBS Wales	15	1995-2010	65	-9	-42	48		
	10	2000-2010	73	30	-4	79		
	5	2005-2010	76	3	-20	27		

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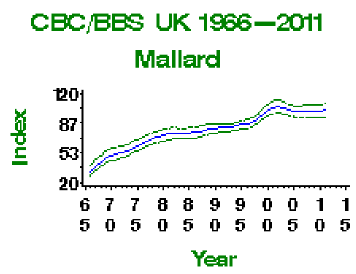
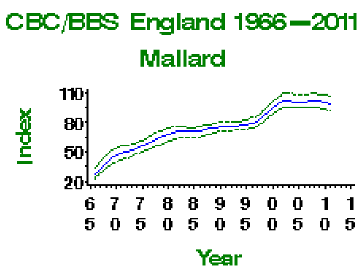
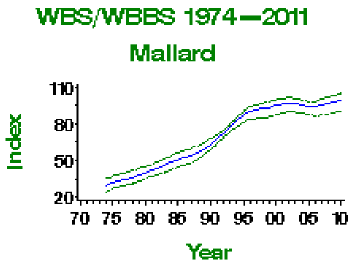


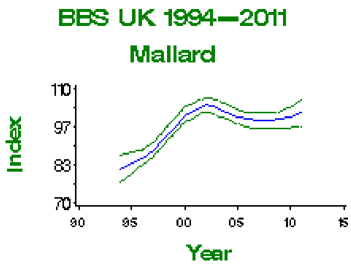
CBC/BBS UK graph



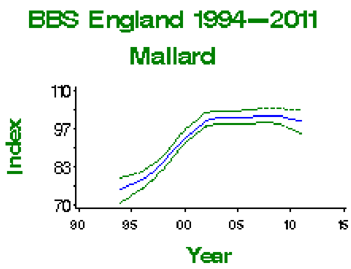
CBC/BBS England graph



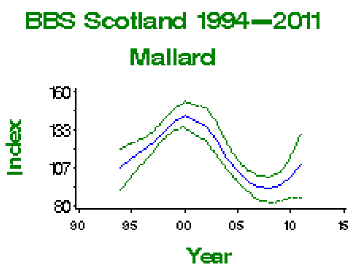
WBS/WBBS waterways graph



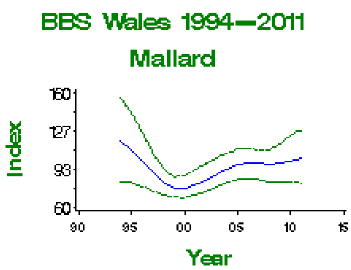
BBS UK graph



BBS England graph



BBS Scotland graph



BBS Wales graph

Demographic trends

Productivity and survival trends for this species are not currently produced by BTO

Causes of change

There is little good evidence available regarding the drivers of the breeding population increase in this species in the UK.

Change factor	Primary driver	Secondary driver
Demographic	Unknown	
Ecological	Unknown	

Further information on causes of change

There are no demographic trends available for this species and there is very little evidence generally relating to the causes of the population increases in the UK.

Mallards originating from domesticated birds and not resembling wild-type birds in either plumage or behaviour are very abundant but perhaps under-represented in survey data, especially since many individuals appear to be semi-captive. A large part of the increase in breeding numbers may be attributable to such birds, rather than to true-bred stock. It is also likely that increases may be at least partly attributable to ongoing large-scale releases for shooting (Marchant et al. 1990).

Declines in wintering numbers have been linked to a decrease in continental immigration (Mitchell et al. 2002, Sauter et al. 2010). Guillemain et al. (2010) found trends of increasing average body mass of Mallard in France which were large enough to have major fitness consequences with respect to winter survival, suggesting that overwinter survival has not decreased. Overwinter loss was investigated in Mallard at 35 inland waters in the Midlands and southern England (Hill 1984). Duckling mortality was the key factor, explaining 58% of total mortality between years and this was weakly density-dependent. Overwinter loss was higher following years when a large number of young were produced and was the main regulatory factor.

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Tufted Duck

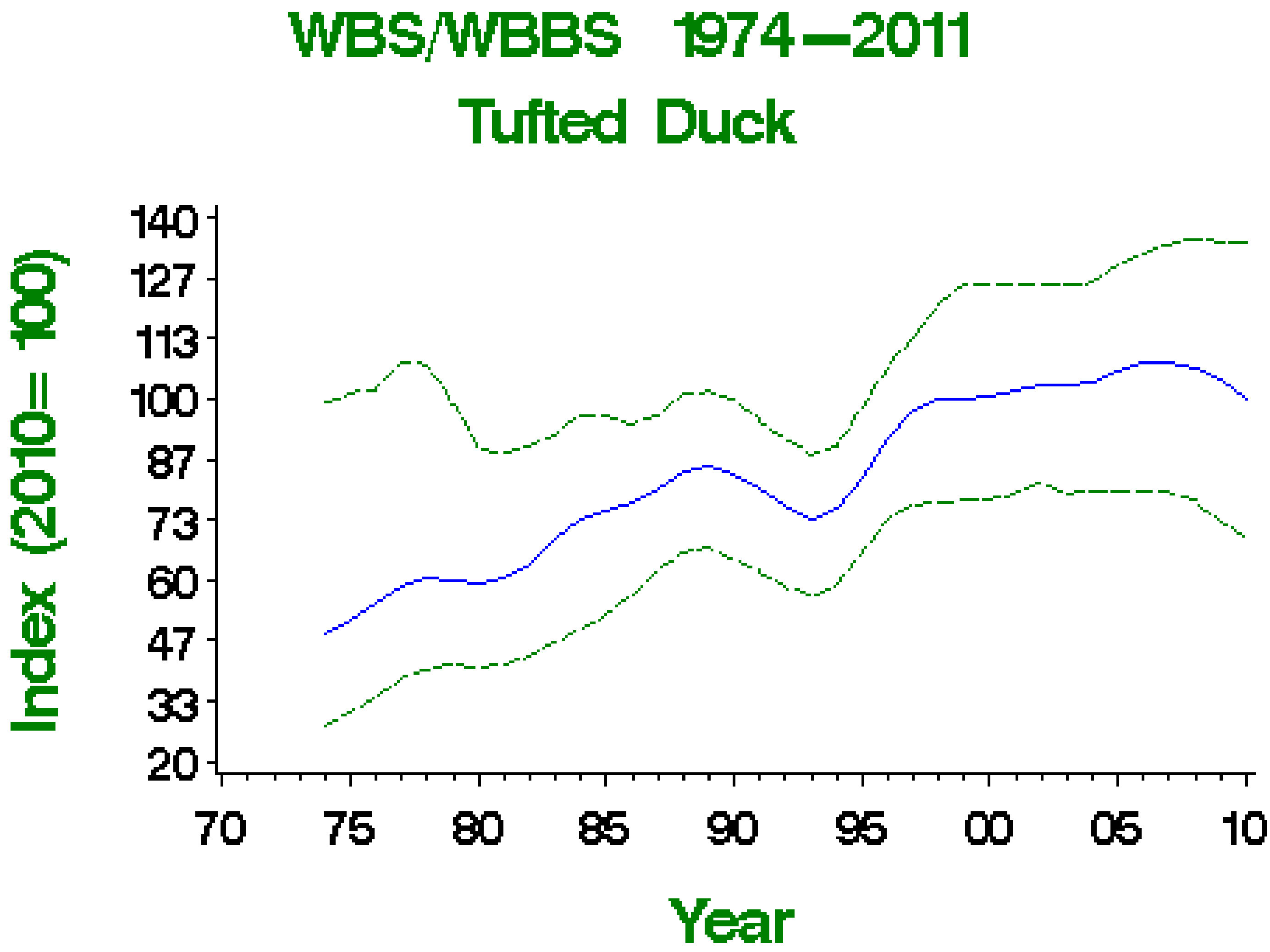
Aythya fuligula

Key facts

Conservation listings:	Europe: SPEC category 3 (declining) (BiE04) UK: amber (European decline) (BoCC3)
Long-term trend:	UK waterways: rapid increase
Population size:	16,000-19,000 pairs in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend for England)

Status summary

The colonisation of the UK by Tufted Ducks, which began in 1849, was aided by the spread of the zebra mussel Dreissena polymorpha, a non-native invasive species that had been introduced accidentally to Britain a few decades earlier. The long-term increase shown by WBS/WBBS, and the 15% increase in range in Britain between the two atlas periods (Gibbons et al. 1993) indicate that population expansion and in-filling of range are still occurring. BBS data also show significant increase since 1994 in the UK as a whole. The species' winter trend in the UK since the 1960s, which includes many continental visitors, is also shallowly upward, but with little recent change (Holt et al. 2012a). In contrast, moderate recent declines elsewhere in northern Europe have resulted in its reclassification as a species of conservation concern (BirdLife International 2004) and have moved the species from the green to the amber list in the UK (Eaton et al. 2009).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
WBS/WBBS waterways	35	1975-2010	36	94	-28	376		
	25	1985-2010	42	32	-27	162		
	10	2000-2010	59	-1	-39	45		
	5	2005-2010	57	-6	-29	13		

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	15	1995-2010	148	40	15	88		
	10	2000-2010	161	16	-10	41		
	5	2005-2010	179	11	-2	27		
BBS England	15	1995-2010	130	33	3	69		
	10	2000-2010	141	16	-7	41		
	5	2005-2010	158	10	-5	24		

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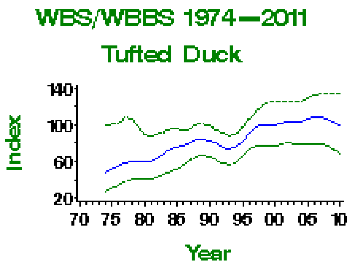
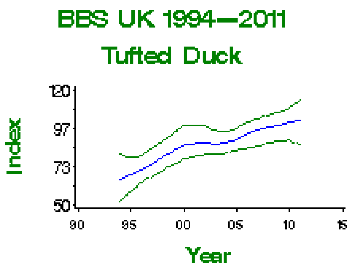
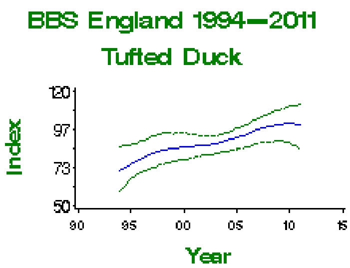


WBS/WBBS waterways graph



BBS UK graph



BBS England graph

Demographic trends

Productivity and survival trends for this species are not currently produced by BTO

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Goosander

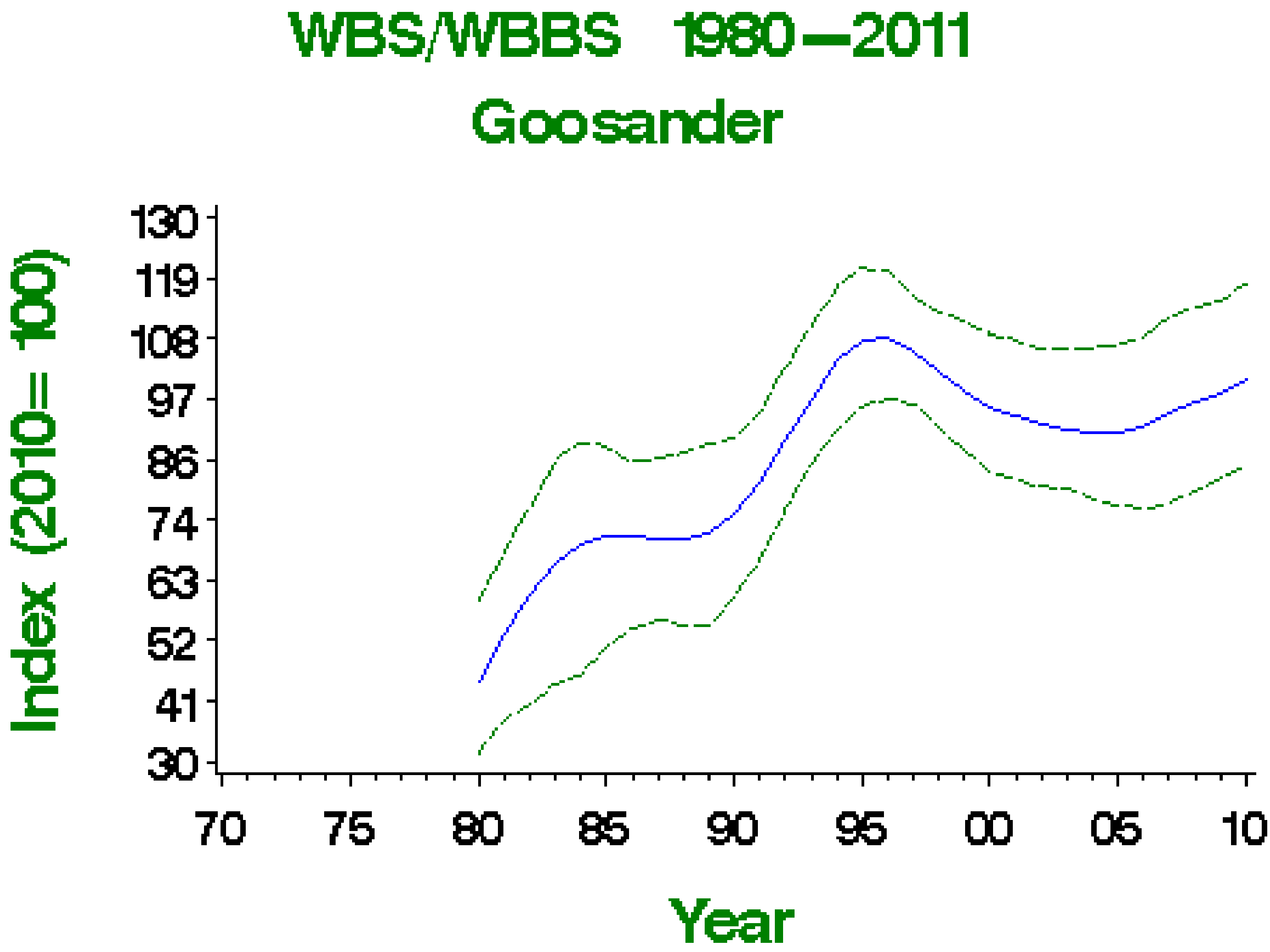
Mergus merganser

Key facts

Conservation listings:	Europe: no SPEC category (favourable conservation status in Europe, not concentrated in Europe) (BiE04) UK: green (BoCC3)
Long-term trend:	UK waterways: moderate increase
Population size:	3,500 (3,100-3,800) pairs in 2009 (APEP13: 1987 estimate (Gregory et al. 1997) updated using WBS/WBBS trend)

Status summary

Goosanders were first discovered to have colonised the UK in Perthshire in 1871, and spread from Scotland into northern England in the 1940s (Holloway 1996). Between the two breeding atlases, the species expanded its range in northern England, and colonised Wales and southwest England. WBS samples became large enough for annual monitoring in 1980, and showed sustained population increase, although this may now have levelled off. The BTO's two national surveys of sawbills demonstrated an average increase in population size of 3% per annum between 1987 and 1997 (Rehfisch et al. 1999). Reasons for the colonisation of the UK, and the subsequent range expansion and population increase, are unknown. The species' winter trend in Britain, comprising British breeders and continental visitors, rose steeply from the late 1960s to the mid 1990s, but has since fallen back to 1980s levels (Holt et al. 2012a).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
WBS/WBBS waterways	29	1981-2010	41	87	22	220		
	25	1985-2010	45	40	-5	128		
	10	2000-2010	71	5	-13	26		
	5	2005-2010	70	10	-4	26		

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment

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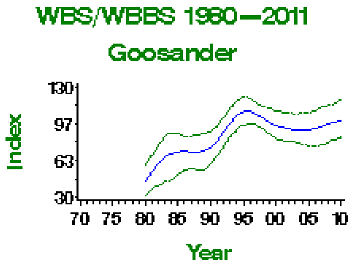

WBS/WBBS waterways graph

Demographic trends

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Red Grouse

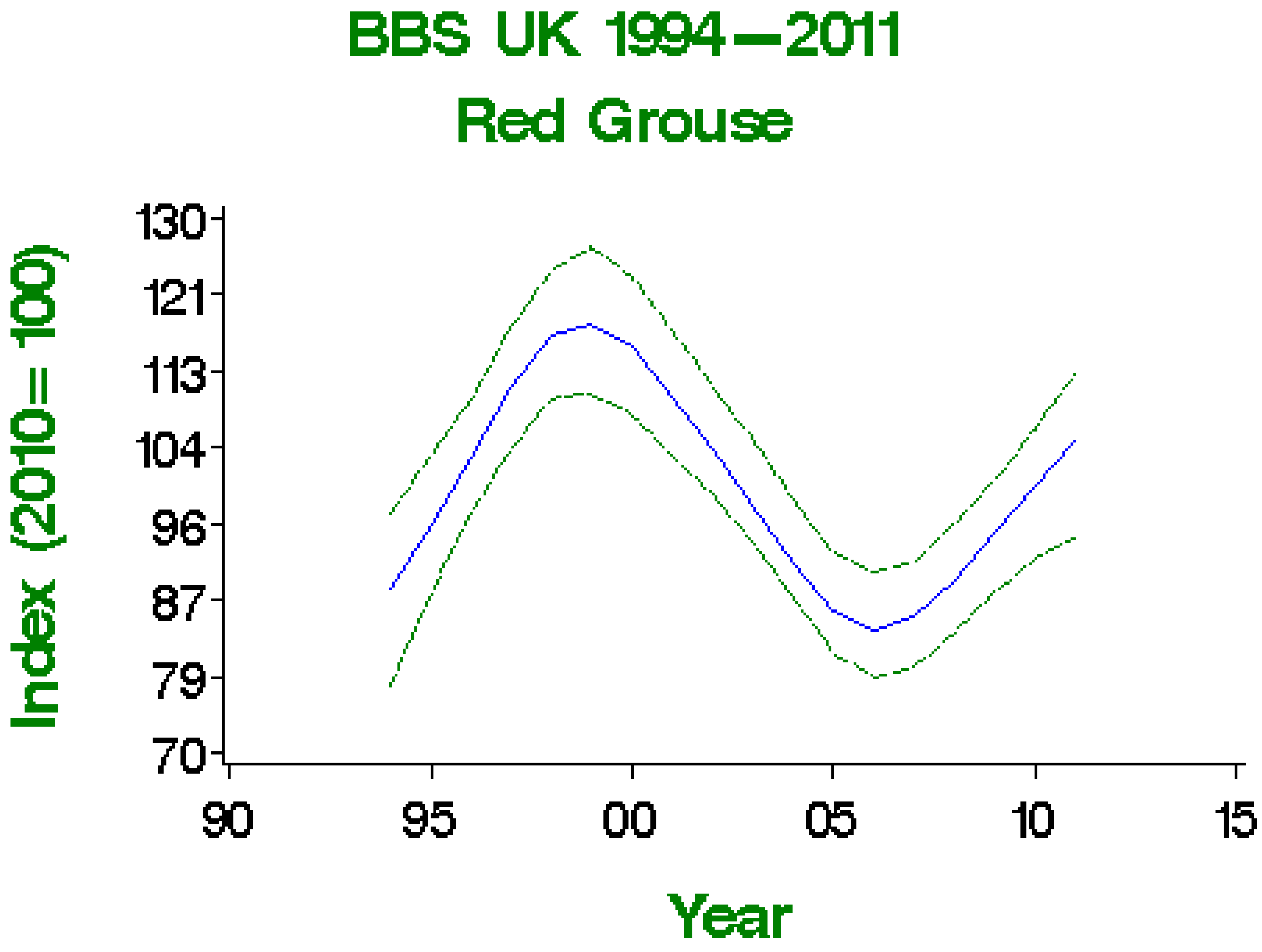
Lagopus lagopus

Key facts

Conservation listings:	Europe: no SPEC category (favourable conservation status in Europe, not concentrated in Europe) (BiE04) UK: amber (25-50% population decline) (BoCC3) UK Biodiversity Action Plan: priority species
Long-term trend:	UK: decline
Population size:	230,000 pairs in 2009 (APEP13: 1988-91 Atlas estimate updated using National Gamebag Census to 1995 and then by BBS trend)

Status summary

The distinctive dark-winged race scotica is endemic to Britain and Ireland and has the vast bulk of its population within the UK, thus conferring global significance to the UK trend. It is economically very important to some rural communities as a game bird and has benefited from intensive management of many moorlands that was designed specifically to increase the numbers of grouse available to be shot. BBS shows fluctuations but no overall trend since 1994. Hudson 1992, Newton 2004), which prompted the move of the species from the green to the amber list in 2002. Longer-term trends in Red Grouse abundance are overlain by cycles, with periods that vary regionally, linked to the dynamics of infection by a nematode parasite (Dobson & Hudson 1992, Gibbons et al. 1993). Raptor predation is believed not to affect breeding populations significantly, although it can reduce numbers in the post-breeding period (Redpath & Thirgood 1997). Thompson et al. 2009). Finding a solution to the harrier-grouse conflict would bring considerable benefits to the management of the UK's heather moorlands and have broad implications for the conservation of predators (Redpath & Thirgood 2009).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	15	1995-2010	135	5	-9	20		
	10	2000-2010	148	-13	-25	-2		

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	5	2005-2010	180	16	1	26		
BBS England	15	1995-2010	77	-6	-25	16		
	10	2000-2010	95	-11	-27	7		
	5	2005-2010	126	8	-7	19		
BBS Scotland	15	1995-2010	52	-1	-26	17		
	10	2000-2010	46	-21	-37	-7		
	5	2005-2010	46	15	-5	38		

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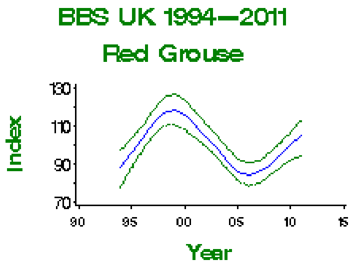
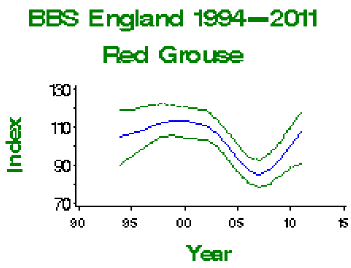
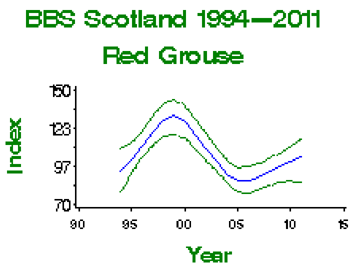


BBS UK graph



BBS England graph



BBS Scotland graph

Demographic trends

Productivity and survival trends for this species are not currently produced by BTO

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Red-legged Partridge

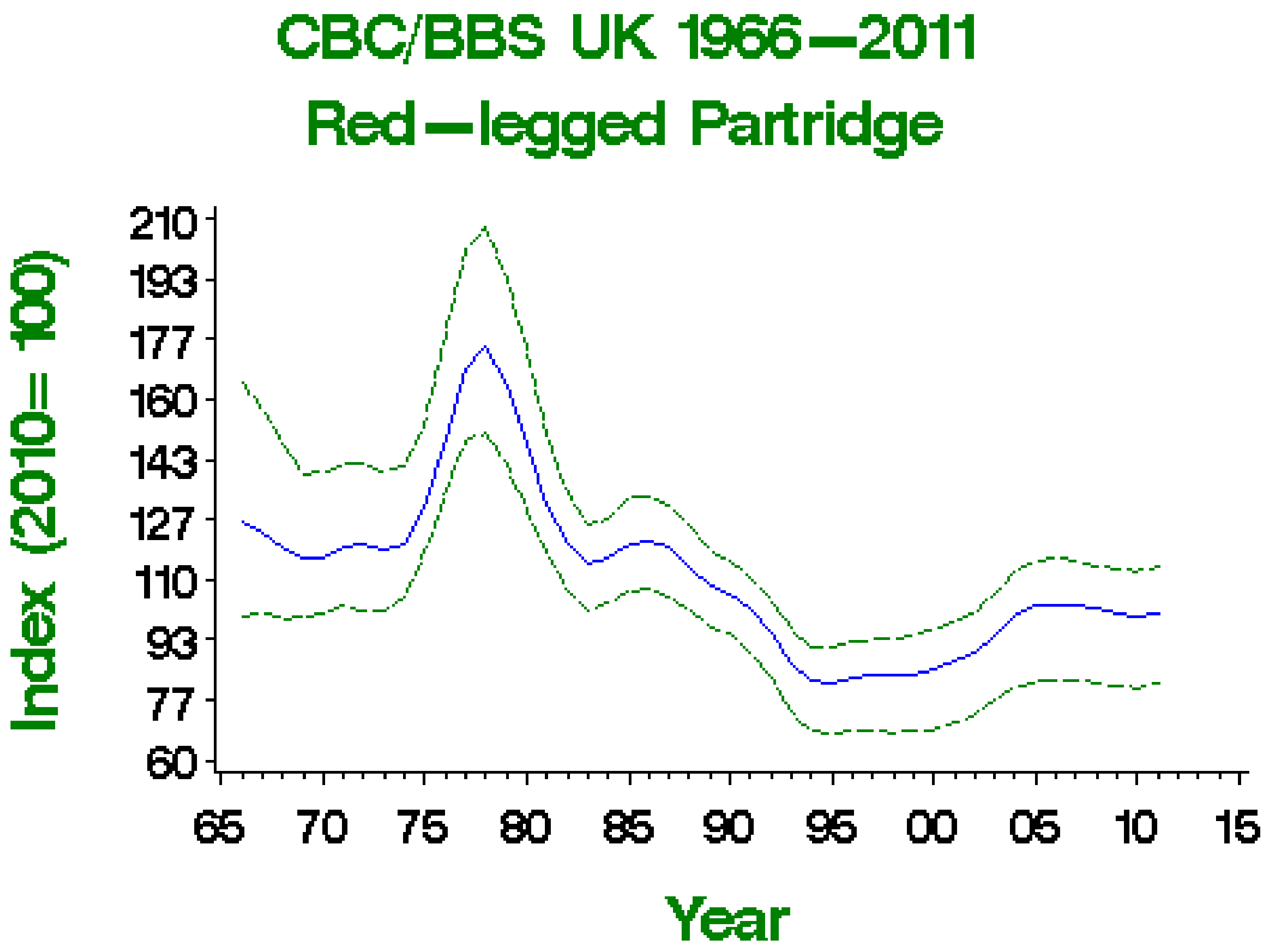
Alectoris rufa

Key facts

Conservation listings:	Europe: SPEC category 2 (declining) (BiE04) UK: not listed (introduced)
Long-term trend:	UK, England: possible shallow decline
Population size:	82,000 territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Status summary

Since Red-legged Partridge is a non-native species released in the UK for the purpose of being shot by hunters, its possible population decrease over the recent 25-year period raises no conservation concern. Moreover, BBS data indicate that significant increase has occurred in the UK and England since 1994. PACEC 2006). The effects on native fauna of such vast-scale releases of this species and Watson et al. 2007). Numbers have shown widespread moderate decline across Europe since 1990, but no longer-term trend is available (PECBMS 2012a).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

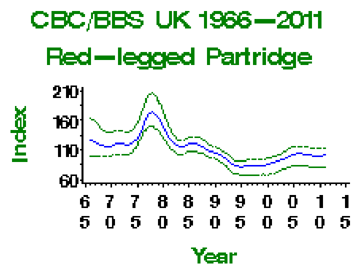
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	221	-19	-49	14		
	25	1985-2010	356	-16	-39	4		
	10	2000-2010	615	18	10	26		
	5	2005-2010	711	-3	-8	3		
CBC/BBS England	43	1967-2010	215	-23	-55	16		

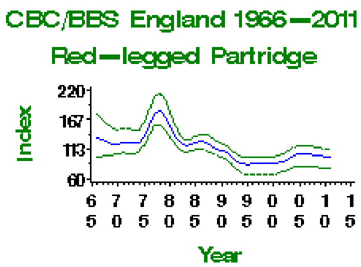
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	25	1985-2010	346	-20	-38	-1		
	10	2000-2010	594	15	8	24		
	5	2005-2010	683	-4	-9	0		
BBS UK	15	1995-2010	533	27	17	38		
	10	2000-2010	604	17	9	25		
	5	2005-2010	695	-1	-5	5		
BBS England	15	1995-2010	519	21	11	32		
	10	2000-2010	584	15	7	23		
	5	2005-2010	670	-2	-8	3		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

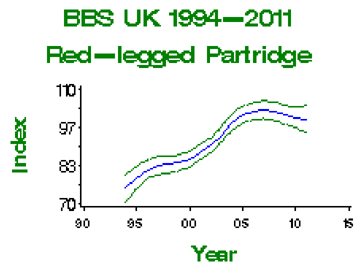
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



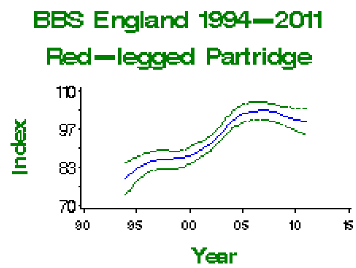
CBC/BBS UK graph



CBC/BBS England graph



BBS UK graph



BBS England graph

Demographic trends

Productivity and survival trends for this species are not currently produced by BTO

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Grey Partridge

Perdix perdix

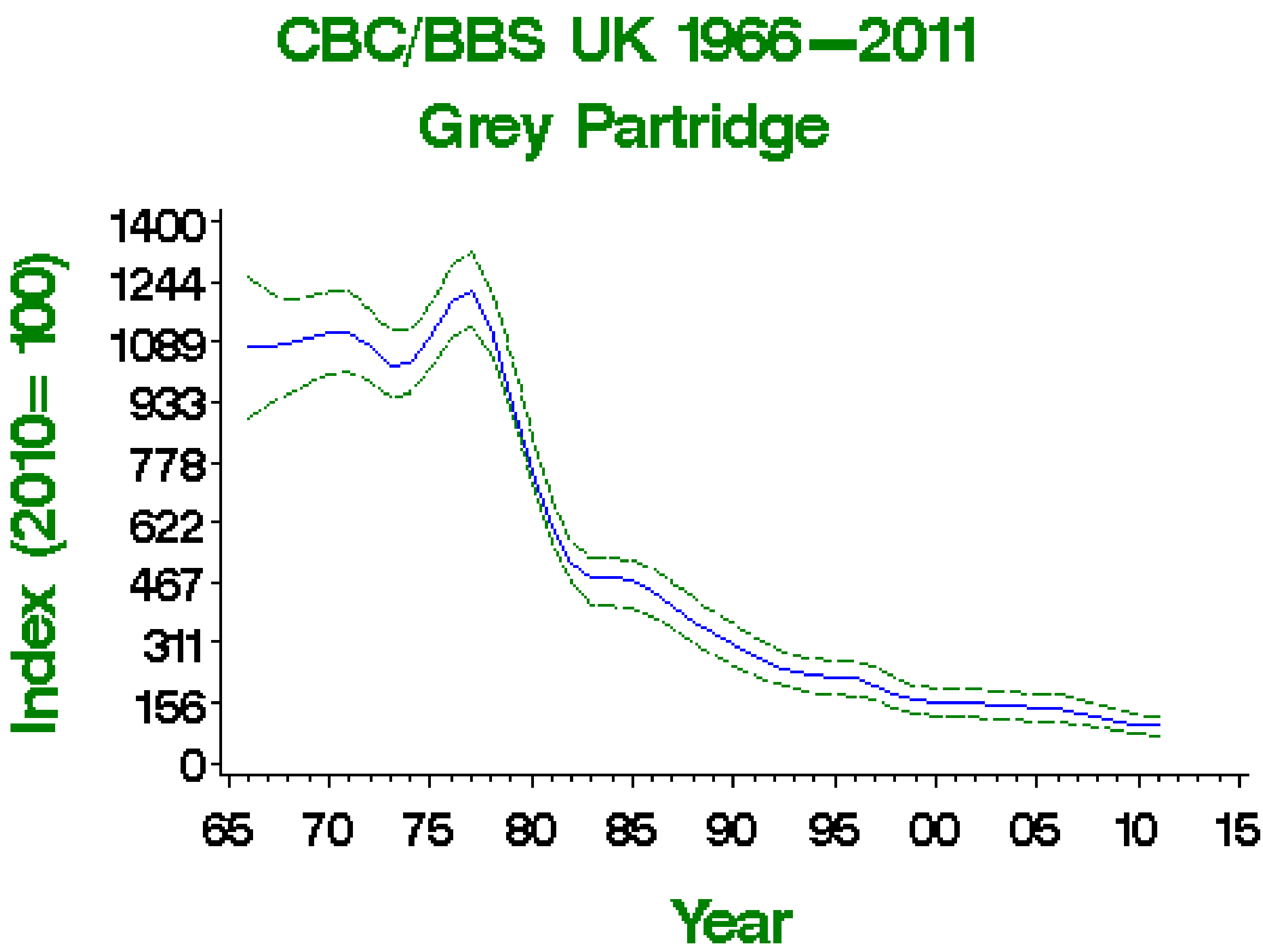
Key facts

Conservation listings:	Europe: SPEC category 3 (vulnerable) (BiE04) UK: red (>50% population decline) (BoCC3) UK Biodiversity Action Plan: click here, priority species
Long-term trend:	UK, England: rapid decline
Population size:	43,000 territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Migrant status:	Resident
Nesting habitat:	Ground nester
Primary breeding habitat:	Farmland
Secondary breeding habitat:	
Breeding diet:	Animal
Winter diet:	Vegetation

Status summary

This native gamebird has declined enormously and, despite years of research and the application of a government Biodiversity Action Plan, the continuing decline shown by CBC/BBS suggests that all efforts to boost the population in the wider countryside have so far been unsuccessful. Grey Partridge is one of the most strongly decreasing bird species in Europe, with rapid declines evident in all regions (Kuijper et al. 2009,PECBMS 2009, 2012a).



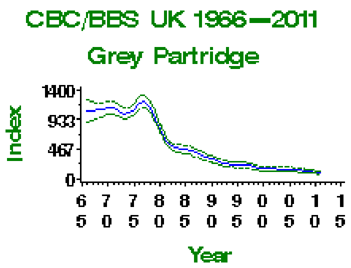
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

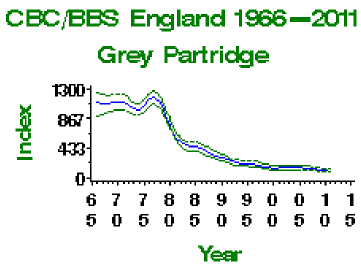
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	130	-91	-94	-86	>50	
	25	1985-2010	170	-79	-84	-71	>50	
	10	2000-2010	227	-35	-46	-26	>25	
	5	2005-2010	243	-30	-38	-20	>25	
CBC/BBS England	43	1967-2010	116	-91	-94	-86	>50	
	25	1985-2010	152	-78	-82	-71	>50	
	10	2000-2010	205	-29	-38	-18	>25	
	5	2005-2010	221	-29	-37	-20	>25	
BBS UK	15	1995-2010	226	-55	-63	-47	>50	
	10	2000-2010	221	-37	-48	-28	>25	
	5	2005-2010	237	-30	-37	-19	>25	
BBS England	15	1995-2010	201	-52	-58	-42	>50	
	10	2000-2010	200	-30	-40	-20	>25	
	5	2005-2010	215	-28	-35	-19	>25	

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

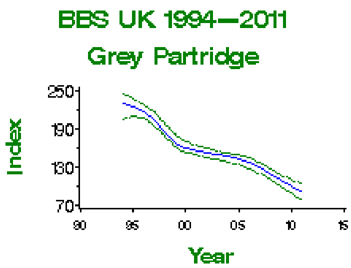
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



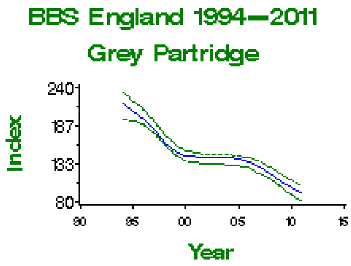
CBC/BBS UK graph



CBC/BBS England graph



BBS UK graph



BBS England graph

Demographic trends

Productivity and survival trends for this species are not currently produced by BTO

Causes of change

The ultimate factor behind the decline is the deterioration of the bird's agricultural habitat. There is convincing evidence showing that a steep drop in chick survival rate as a result of decreasing chick food availability due to agricultural intensification is the primary driver of population declines. A reduction of hen survival rate during incubation, lower nest success and reduction of winter survival, related to increased predation rates, have all been reported as also playing secondary roles.

Change factor	Primary driver	Secondary driver
Demographic	Decreased breeding success	Reduced adult survival
Ecological	Agricultural intensification	Increased predation

Further information on causes of change

The ultimate factor behind the decline of this species is the deterioration of the bird's agricultural habitat (Aebischer & Ewald 2004). A detailed field and modelling study in the 1980s provides excellent evidence relating to the ecology and population dynamics of the Grey Partridge in a large (62 sq km) study area in Sussex (Potts 1980, Potts 1986). Potts (1980, 1986) identified a reduction in chick survival during the first six weeks after hatching due to a herbicide-induced fall in cereal invertebrate abundance as the primary reason for the decline. More recently, the intensive use of broad-spectrum insecticides on cereals in the summer has been associated with a further reduction in average chick survival rate (Aebischer & Potts 1998). A field study involving an experimental set-up using sprayed and non-sprayed fields confirmed that invertebrate food supplies were important as it was shown that use of pesticides reduced food available to chicks, resulting in lower chick survival and thus depleting numbers of birds being recruited into the population (Rands 1985). Further support for this comes from Sotherton et al. (1993), who also both found that chick survival rate was lower in sprayed areas as compared to unsprayed areas.

Potts also identified two other causes for the decline: the disappearance of nesting cover as field boundaries were removed to improve farming efficiency and lower brood production resulting from increased predation. There is evidence from various sources indicating that a reduction of hen survival rate during incubation, lower nest success and a reduction of winter survival, related to increased predation rates, have been influential in the continued population decrease from the 1970s (Potts & Aebischer 1995, Tapper et al. 1996, Bro et al. 2000, De Leo et al. 2004, Panek 2005).

Aebischer & Ewald (2010) offer convincing evidence that, since 2002, local Grey Partridge recoveries have been made possible by sympathetic management of rotational set-aside to provide cover for chicks. In an area of nearly 1,000 ha in Hertfordshire, set-aside was used for habitat creation and Grey Partridge breeding density increased sixfold. However, the disappearance of rotational set-aside in 2007, which halved the amount of brood-rearing habitat, with concurrent poor weather, reversed the increase and effectively removed this potential mechanism for national population recovery.

Overshooting due to failure to separate Grey Partridges from Red-legs can have local population effects, but this is not likely to be a national problem (Aebischer & Ewald 2004). Aebischer & Ewald (2010) showed that on Partridge Count Scheme (PCS) sites, the annual change in spring density in recent years was not related to either shooting pressure or intensity of Red-legged Partridge releasing and suggest that provision of brood-rearing habitats and game cover increased with the latter, which probably counteracted the shooting losses of Grey Partridges on Red-legged Partridge shoots.

In some areas, parasite-mediated apparent competition with the Pheasant may be influencing the decline and subsequent recovery of wild Grey Partridges (Tompkins et al. 2000a, b). However, the evidence for this is conflicting, as Sage et al. (2002) found no deleterious fitness effects of the parasite and Browne et al. (2006) found that poor wild brood survival was indicative of low habitat and food quality rather than of a high rate of parasite infection.

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Pheasant

Phasianus colchicus

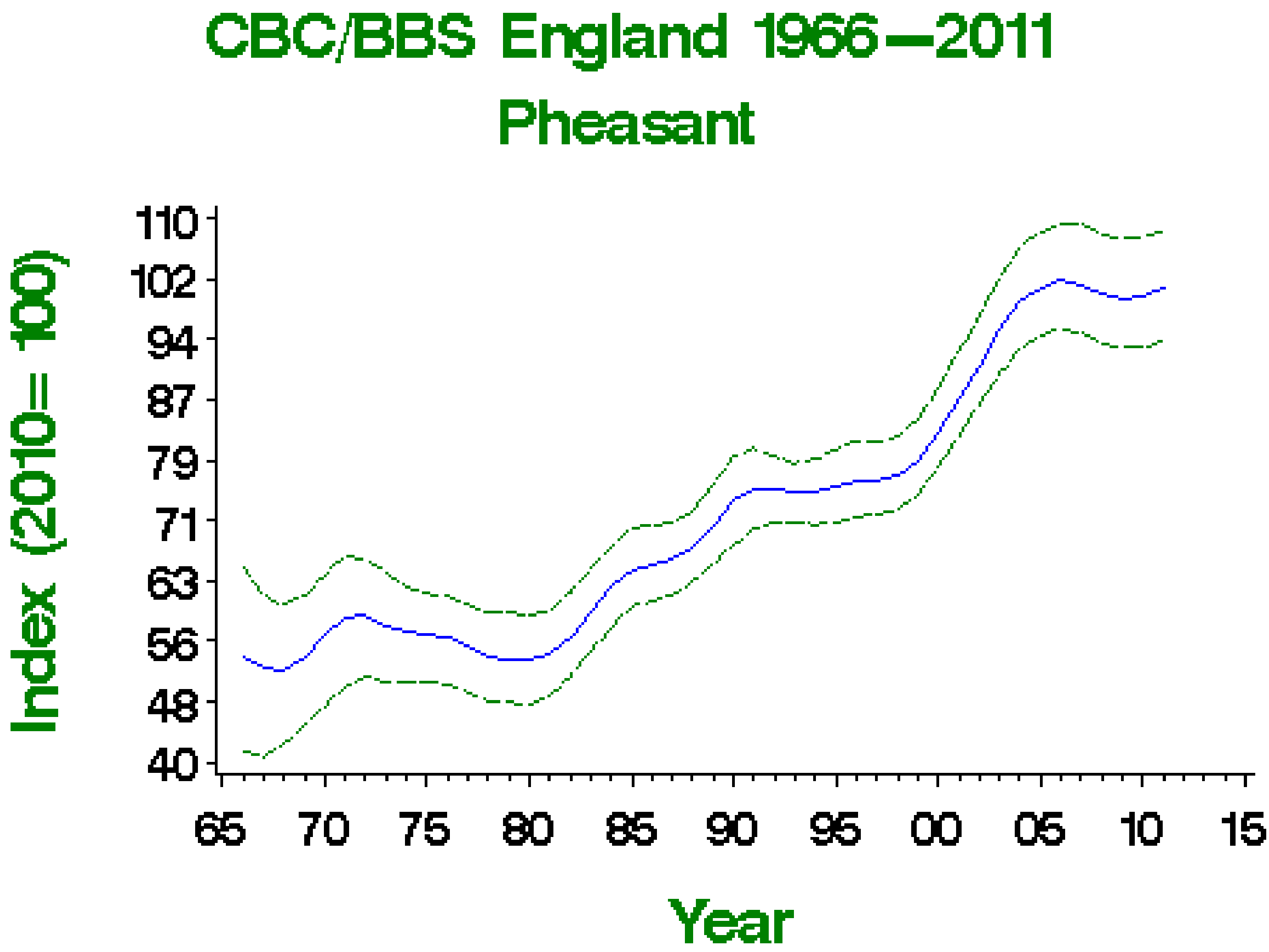
Key facts

Conservation listings:	Europe: no SPEC category (favourable conservation status in Europe, not concentrated in Europe) (BiE04) UK: not listed (introduced)
Long-term trend:	England: moderate increase
Population size:	2.3 million females in 2009 (APEP13: 1988-91 Atlas estimate (Robertsonet al. 1989) updated using CBC/BBS trend for England); at least 35 million captive-reared birds released each autumn (PACEC 2006)

Migrant status:	Resident
Nesting habitat:	Ground nester
Primary breeding habitat:	Farmland
Secondary breeding habitat:	Woodland
Breeding diet:	Vegetation
Winter diet:	Vegetation

Status summary

Pheasants have increased in abundance since the 1960s, at a rate that appears to be accelerating. The BBS records increase in England and Wales, but little change in Scotland since 1994. During 1968-88, a period when the total biomass of birds in Britain fell by an estimated 10%, CBC data indicate that Pheasant biomass rose by about 2,500 tonnes - more than ten times more than any other species (Dolton & Brooke 1999).



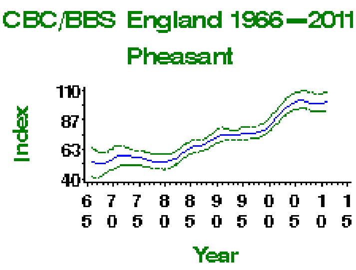
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

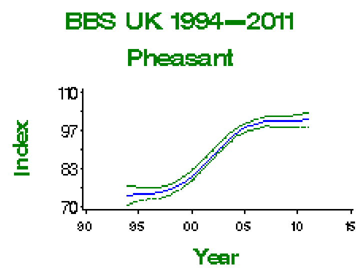
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	43	1967-2010	625	92	53	173		
	25	1985-2010	1002	54	32	79		
	10	2000-2010	1711	22	16	26		
	5	2005-2010	1976	-1	-4	2		
BBS UK	15	1995-2010	1735	35	27	42		
	10	2000-2010	1969	24	19	29		
	5	2005-2010	2263	3	0	5		
BBS England	15	1995-2010	1465	35	28	43		
	10	2000-2010	1661	22	16	26		
	5	2005-2010	1908	1	-3	4		
BBS Scotland	15	1995-2010	129	18	-1	38		
	10	2000-2010	140	26	10	44		
	5	2005-2010	165	12	1	22		
BBS Wales	15	1995-2010	91	46	7	92		
	10	2000-2010	106	52	23	82		
	5	2005-2010	120	1	-9	8		
BBS N.Ireland	15	1995-2010	39	159	49	245		
	10	2000-2010	49	55	23	100		
	5	2005-2010	57	28	11	47		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

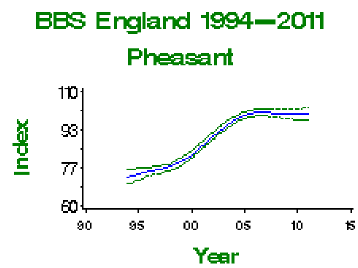
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



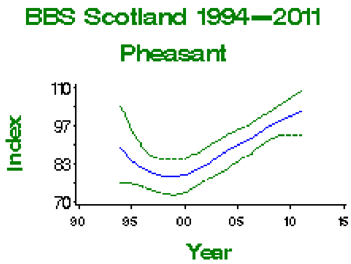
CBC/BBS England graph



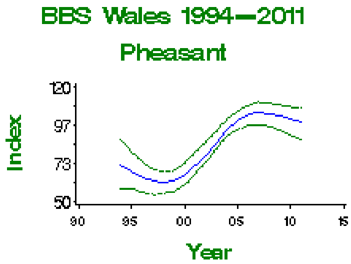
BBS UK graph



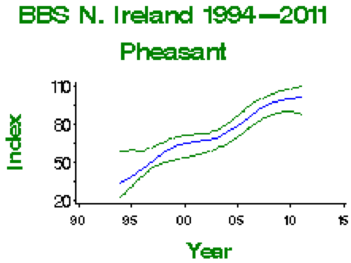
BBS England graph



BBS Scotland graph



BBS Wales graph



BBS N.Ireland graph

Demographic trends

Productivity and survival trends for this species are not currently produced by BTO

Causes of change

The population size of this species is principally determined by releases of reared birds for shooting, which have increased sixfold since 1960. Little is known about the impacts of changes in demographic parameters among wild-breeding birds.

Change factor	Primary driver	Secondary driver
Demographic	Unknown	
Ecological	Other	

Further information on causes of change

It must be noted that numbers of this introduced gamebird are determined principally by releases of reared birds for shooting (Marchant et al. 1990). Such releases have increased approximately sixfold since 1960 (game-bag data) and were recently running at around 35 million birds annually (PACEC 2006). Robertson (1991) studied records of Pheasant nests from the Nest Record Scheme and found that productivity is probably too low to sustain a population. There is little else known about changes in demographic parameters of Pheasants in the UK.

High Pheasant densities potentially have negative effects, which have not been adequately studied, on native UK birds: these include their effect on the structure of the field layer in woodland, the spread of disease and parasites and competition for food (Fuller et al. 2005). Infection with caecal nematodes from farm-reared Pheasants may be contributing to the decline of Grey Partridges in Britain (Tompkins et al. 2000b), although Sage et al. (2002) found that this had no population impact.

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S.,

Red-throated Diver

Gavia stellata

Key facts

Conservation listings:	Europe: SPEC category 3 (depleted) (BiE04) UK: amber (European status) (BoCC3); an RBBP species
Long-term trend:	UK: increase
Population size:	1,300 (1,000-1,600) pairs in 2006 (APEP13: Dillon et al. 2009)

Status summary

Population trends are not monitored by the BTO, but JNCC's Mavor et al. 2008). Complete surveys of Shetland indicated a decrease of 36% there between 1983 and 1994, however (Gibbons et al. 1997). The estimated breeding population in 2006 had increased significantly by 34% since the first national survey in 1994, with stability in Shetland and Orkney but increase across the Hebrides and Scottish mainland (Dillon et al. 2009). Since the 1980s, there may have been some tendency for more pairs to hatch a second chick, although two-chick broods are only occasional in Orkney and the proportion of nest records from there could have changed over time.

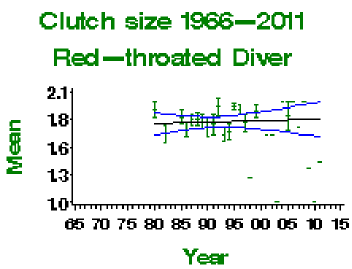
Population changes in detail

Annual breeding population changes for this species are not currently monitored by BTO

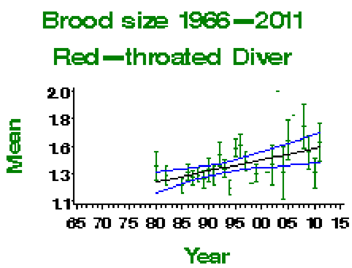
Demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Clutch size	30	1980-2010	18	None					Small sample
Brood size	30	1980-2010	29	Linear increase	1.25 chicks	1.53 chicks	22.0%		Small sample
Nest failure rate at egg stage	30	1980-2010	11	Linear increase	0.67% nests/day	2.23% nests/day	232.8%		Small sample
Nest failure rate at chick stage	30	1980-2010	16	None					Small sample

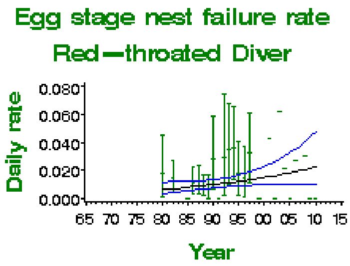
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



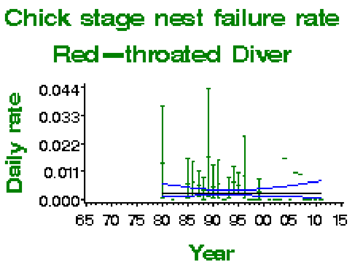
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

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Cormorant

Phalacrocorax carbo

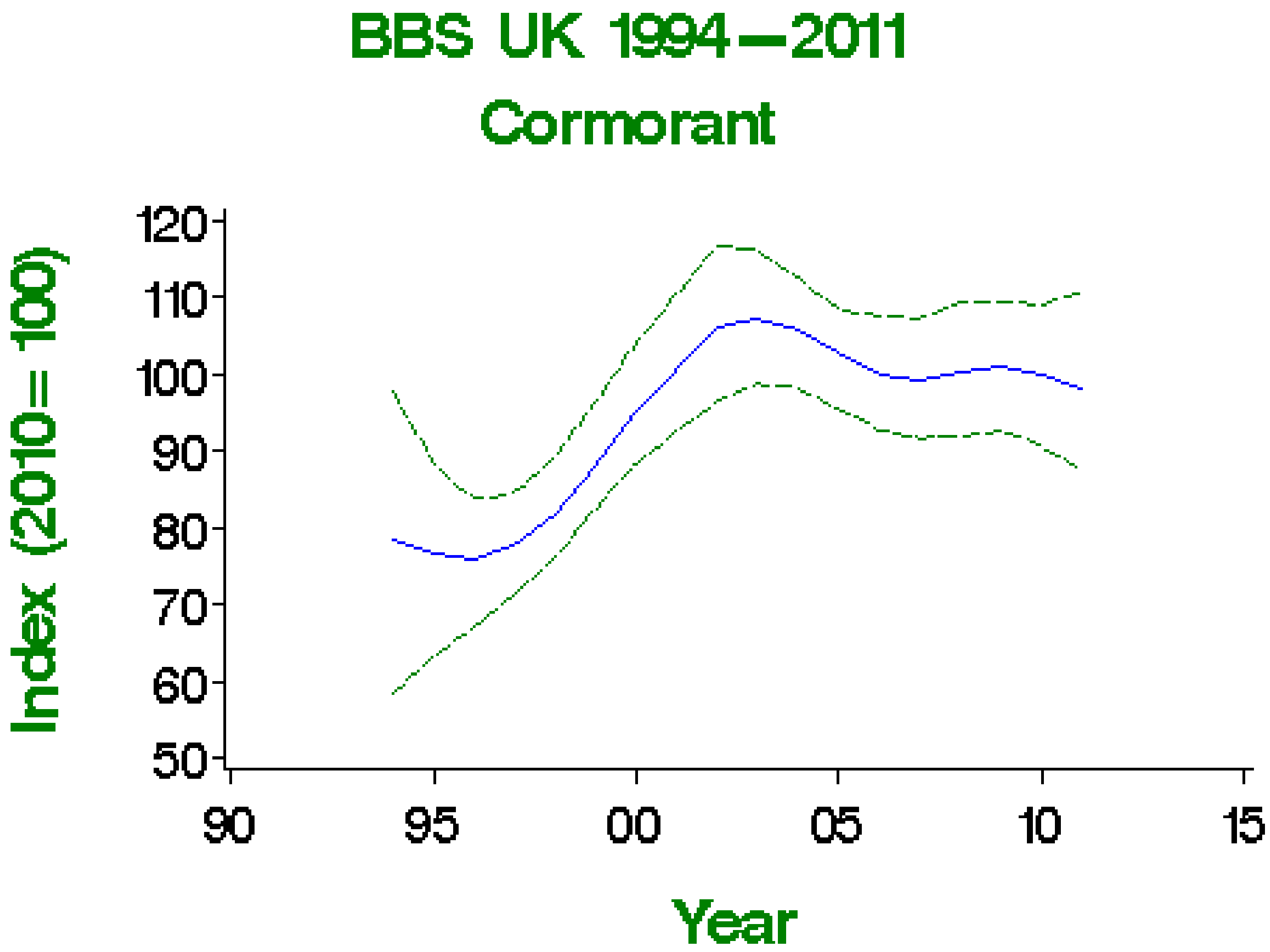
Key facts

Conservation listings:	Europe: no SPEC category (favourable conservation status in Europe, not concentrated in Europe) (BiE04) UK: green (species level); amber (race *carbo*, >20% of European breeders; race *sinensis*, localised breeding) (BoCC3)
Long-term trend:	UK: increase
Population size:	9,000 pairs in 1998-2002 (APEP13: Mitchell et al. 2004)

Status summary

The Cormorant was almost exclusively a coastal breeder in the UK until 1981, but has since established colonies in many inland areas of eastern and central England (Rehfisch et al. 1999; Newson et al. 2006). By 2005, breeding had been recorded at 58 inland sites, and the inland population had risen to about 2,130 pairs (Newson et al. 2007). Inland breeding in England is thought to have been sparked by birds of the continental race sinensis from the Netherlands and Denmark, although many nominate carbo from coastal colonies in Wales and England have contributed to its development.

Breeding numbers and productivity at sample colonies have been monitored annually since 1986 by JNCC's JNCC 2012). Trends during 1986-2005 show decreases in Scotland and in northeast and southwest England, but no trend in Wales, and steep increases inland in England and in regions bordering the northern part of the Irish Sea (Mavor et al. 2008). Reasons for recent decline probably include increased mortality from licensed and unlicensed shooting. BBS counts are very largely of immature or other non-breeding birds inland and away from breeding sites and, until we have better information on the proportions of breeding and non-breeding birds recorded on BBS, the generally upward trend probably addslittle information about breeding numbers. The winter trend in Britain, comprising British and Irish breeders and continental visitors, has shown strong increase since the late 1980s but is now stable or in shallow decline (Holt et al. 2012a). Although the species is now green listed, both races that occur in the UK warrant amber listing, for reasons unconnected with the UK trend.



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	15	1995-2010	234	30	4	68		Non-breeders included
	10	2000-2010	280	5	-13	23		Non-breeders included
	5	2005-2010	318	-3	-15	12		Non-breeders included
BBS England	15	1995-2010	195	19	1	43		Non-breeders included
	10	2000-2010	234	9	-7	23		Non-breeders included
	5	2005-2010	270	-5	-16	7		Non-breeders included

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

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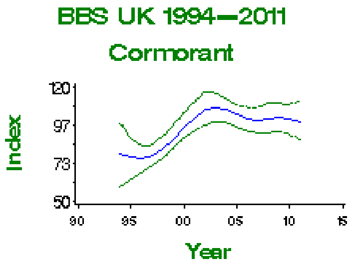
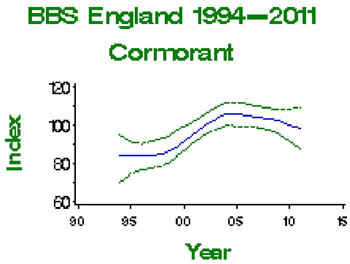


BBS UK graph



BBS England graph

Demographic trends

Productivity and survival trends for this species are not currently produced by BTO

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Grey Heron

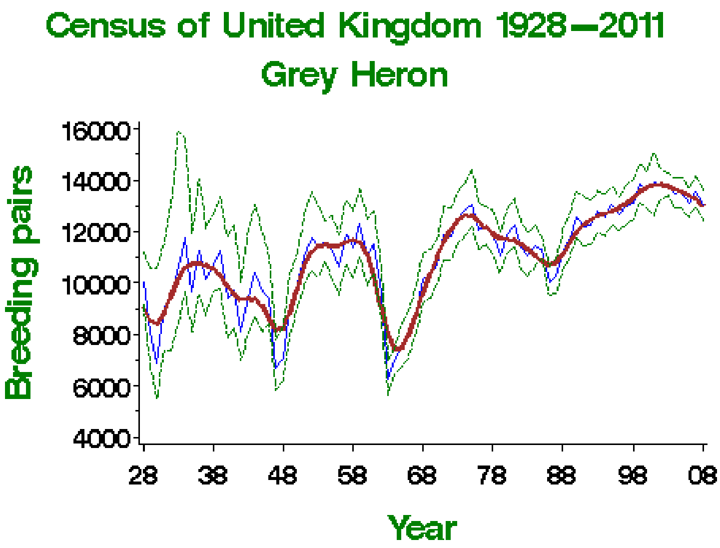
Ardea cinerea

Key facts

Conservation listings:	Europe: no SPEC category (favourable conservation status in Europe, not concentrated in Europe) (BiE04) UK: green (BoCC3)
Long-term trend:	UK, Wales, Scotland: shallow increase England: moderate increase
Population size:	13,000 pairs in 2007-11 (APEP13); 11,377 (10,810-11,917) nests in 2011 (Heronries Census)

Status summary

The BTO Heronries Census, which has monitored Grey Herons since 1928, shows the species to be more abundant in the early 2000s than at any time in the last 80 years. The effects of harsh winters, which induce severe mortality in this species (Besbeas et al. 2002), are clearly visible in the long-term trend. The general increase that underlies these fluctuations may stem from reduced persecution, improvements in water quality, the provision of new habitat as new lakes and gravel pits mature, and increased feeding opportunities at freshwater fisheries (Gibbons et al. 1993, Marchant et al. 2004). A downturn evident since 2001 seems unrelated to winter weather and is, as yet, unexplained. High rates of nest failure at the chick stage were noted in the late 1960s, but not subsequently. The mean laying date has advanced by almost a month since 1968. In the latest special survey of UK heronries, carried out in 2003 to mark the 75th anniversary of the Heronries Census, a record total of more than 10,441 Grey Heron nests were counted. The current population estimates for that year, implying that around 3,300 nests in the UK were not reported to the survey, allow for known heronries (mostly in Scotland) that were not visited in 2003, but not for the few areas, mainly in Scotland and Northern Ireland, where heronries have never been counted. This issue was addressed by random tetrad searches conducted in 2003 and 2004. Numbers have risen rapidly across Europe since 1980 (PECBMS 2012a).



Estimated population size for each year in blue, with 85% confidence limits in green and smoothed trend in red

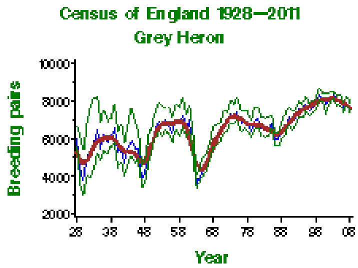
Population changes in detail

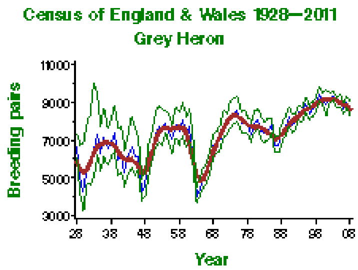
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Heronries UK	81	1929-2010	329	42				
	25	1985-2010	537	11				
	10	2000-2010	610	-12				
	5	2005-2010	627	-11				
Heronries England and Wales	81	1929-2010	272	47				
	25	1985-2010	433	10				
	10	2000-2010	493	-12				
	5	2005-2010	503	-11				
Heronries England	81	1929-2010	230	46				
	25	1985-2010	361	12				
	10	2000-2010	421	-12				
	5	2005-2010	431	-11				
Heronries Scotland	75	1935-2010	46	30				
	25	1985-2010	82	40				

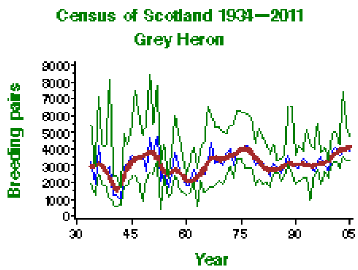
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	10	2000-2010	91	11				
	5	2005-2010	90	5				
Heronries Wales	75	1935-2010	42	6				
	25	1985-2010	69	8				
	10	2000-2010	70	-1				
	5	2005-2010	71	-3				
BBS UK	15	1995-2010	653	-3	-13	7		Non-breeders included
	10	2000-2010	740	-16	-23	-10		Non-breeders included
	5	2005-2010	825	-19	-25	-14		Non-breeders included
BBS England	15	1995-2010	539	-8	-19	3		Non-breeders included
	10	2000-2010	615	-10	-18	-4		Non-breeders included
	5	2005-2010	696	-18	-24	-14		Non-breeders included
BBS Scotland	15	1995-2010	49	7	-20	37		Non-breeders included
	10	2000-2010	52	-27	-39	-10	>25	Non-breeders included
	5	2005-2010	56	-27	-41	-8	>25	Non-breeders included
BBS Wales	15	1995-2010	44	-22	-40	2		Non-breeders included
	10	2000-2010	48	-32	-44	-17	>25	Non-breeders included
	5	2005-2010	47	-33	-43	-21	>25	Non-breeders included

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

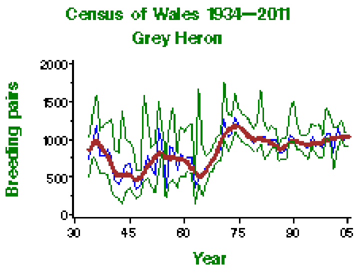
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



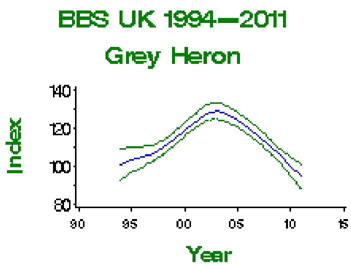




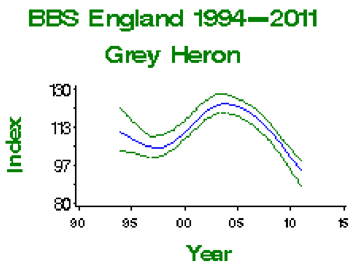
Grey Heron Scotland graph



Grey Heron Wales graph



Smoothed population index, relative to an arbitrary 100 in 2009, with 85% confidence limits in green



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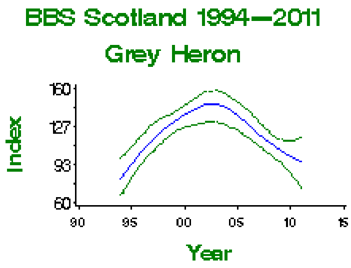
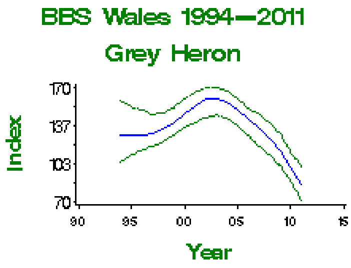


Smoothed population index, relative to an arbitrary 100 in 2009, with 85% confidence limits in green



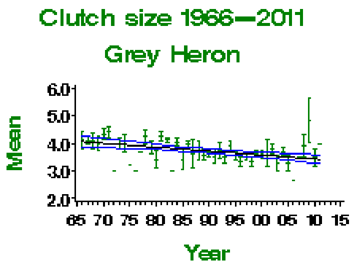
Smoothed population index, relative to an arbitrary 100 in 2009, with 85% confidence limits in green

Demographic trends

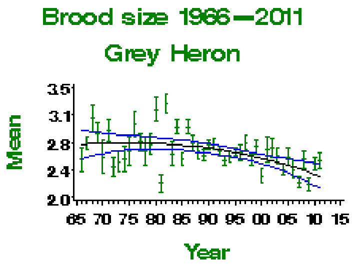
Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	18	None					
Fledglings per breeding attempt	42	1968-2010	18	None					

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Clutch size	42	1968-2010	15	Linear decline	4.04 eggs	3.44 eggs	-15.0%		Small sample
Brood size	42	1968-2010	91	Curvilinear	2.73 chicks	2.32 chicks	-15.2%		
Nest failure rate at egg stage	42	1968-2010	18	Curvilinear	0.00% nests/day	0.03% nests/day			Small sample
Nest failure rate at chick stage	42	1968-2010	40	None					

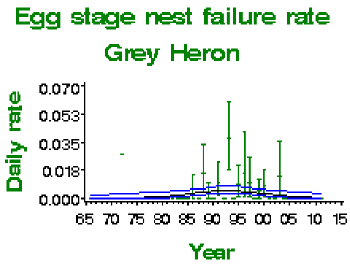
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



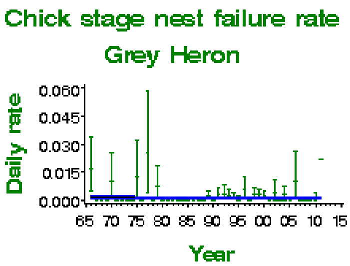
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

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Little Grebe

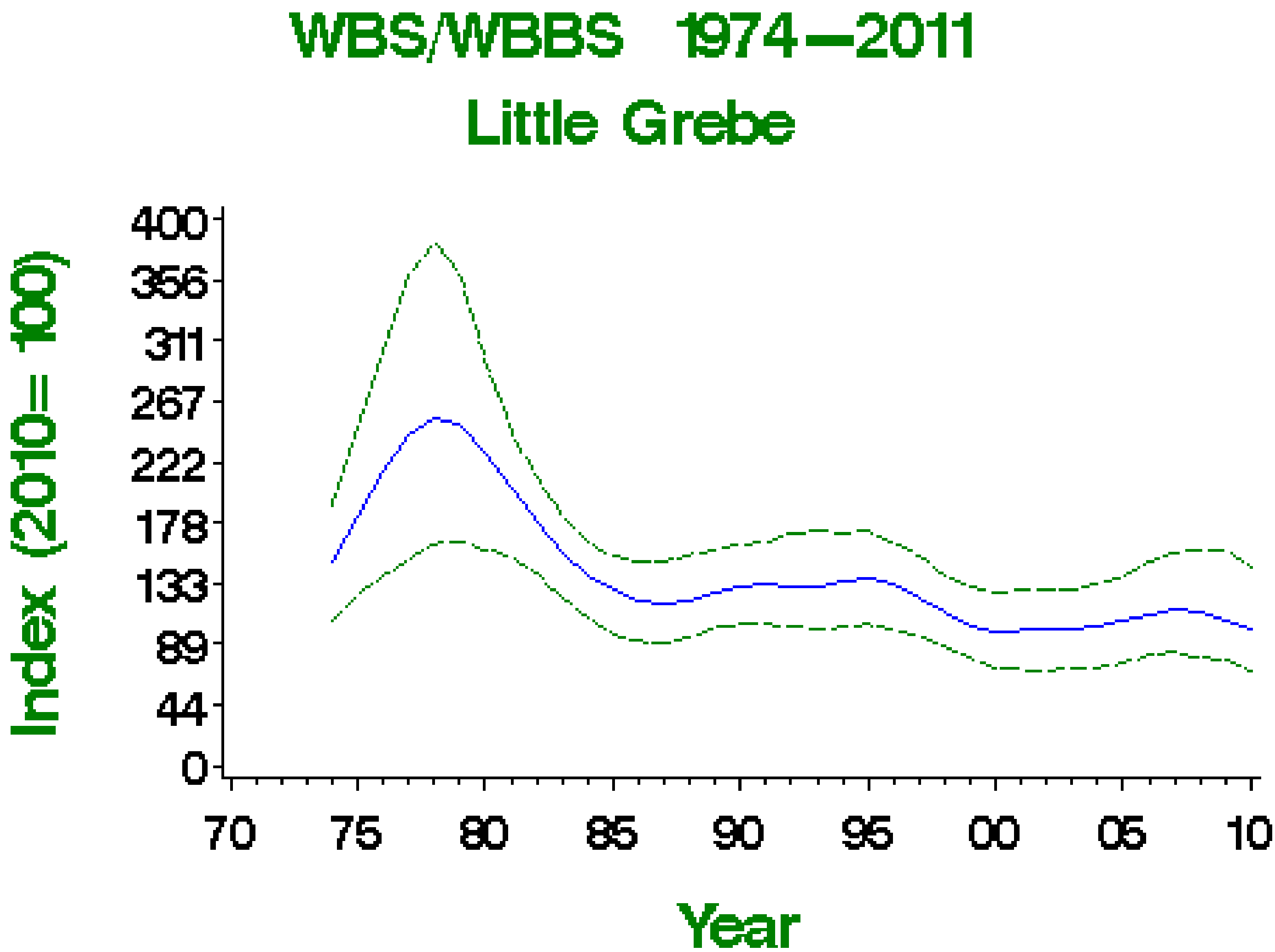
Tachybaptus ruficollis

Key facts

Conservation listings:	Europe: no SPEC category (favourable conservation status in Europe, not concentrated in Europe) (BiE04) UK: amber (25-50% population decline) (BoCC3)
Long-term trend:	UK: uncertain
Population size:	3,900-7,800 pairs in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Status summary

The rapid decline shown by the WBS/WBBS may reveal problems among birds on linear waterways during the early 1980s and since the late 1990s, while shallow increases shown by the CBC and by BBS may suggest that wider populations (including birds on small still waters) are healthy. Because of the shortage of data, and the conflict between WBS and BBS assessments, the rapid decline indicated by WBS in the 1980s did not initially trigger a conservation listing. The species was moved from the green to the amber list in 2009, however, on the strength of its UK decline. In an analysis of nest record cards, Moss & Moss (1993) found that nests on ponds and lakes were significantly more successful than those on rivers and streams and that nests on rivers, subject to fluctuating water levels, experienced significantly higher failure rates through flooding than those on canals, where water levels are artificially maintained. Winter numbers, as monitored by WeBS, showed sustained shallow increase until 2008, followed by a minor decline (Holt et al. 2012a).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

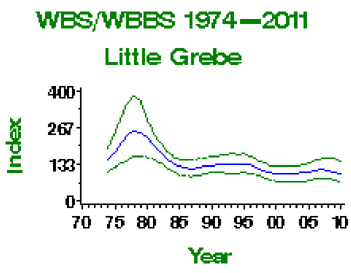
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
WBS/WBBS waterways	35	1975-2010	21	-45	-73	27		
	25	1985-2010	21	-22	-53	44		
	10	2000-2010	24	2	-28	67		

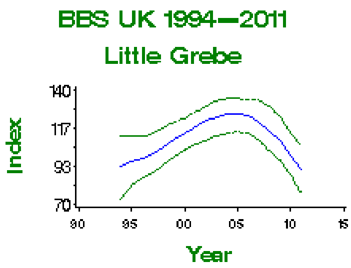
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	5	2005-2010	23	-6	-30	49		
BBS UK	15	1995-2010	69	4	-19	44		
	10	2000-2010	80	-12	-30	12		
	5	2005-2010	91	-20	-35	-5		
BBS England	15	1995-2010	56	-2	-30	34		
	10	2000-2010	63	-15	-35	4		
	5	2005-2010	71	-15	-30	-1		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

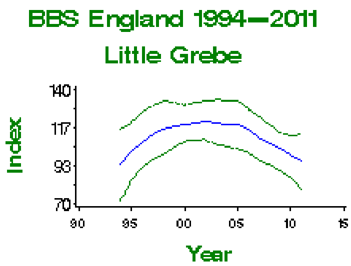
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



WBS/WBBS waterways graph



BBS UK graph



BBS England graph

Demographic trends

Productivity and survival trends for this species are not currently produced by BTO

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Great Crested Grebe

Podiceps cristatus

Key facts

Conservation listings:	Europe: no SPEC category (favourable conservation status in Europe, not concentrated in Europe) (BiE04) UK: green (BoCC3)
Long-term trend:	UK: probable increase
Population size:	5,300 pairs in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Status summary

This species was believed to be on the verge of extinction in Britain around 1860, when only 32-72 pairs were known in England (Holloway 1996). A subsequent increase followed reductions in persecution, aided by statutory protection, and the creation of habitat in the form of gravel pits (Gibbons et al. 1993). Increase was tracked by special surveys to around 7,000 adult birds in Britain by 1975 (Hughes et al. 1979). The BBS provides the first annual, national monitoring of this species and indicates shallow increase since 1994. Winter numbers, monitored by WeBS, have shown a long-term shallow increase but may now be in shallow decline (Holt et al. 2012a).

Population changes in detail

Annual breeding population changes for this species are not currently monitored by BTO

Demographic trends

Productivity and survival trends for this species are not currently produced by BTO

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Red Kite

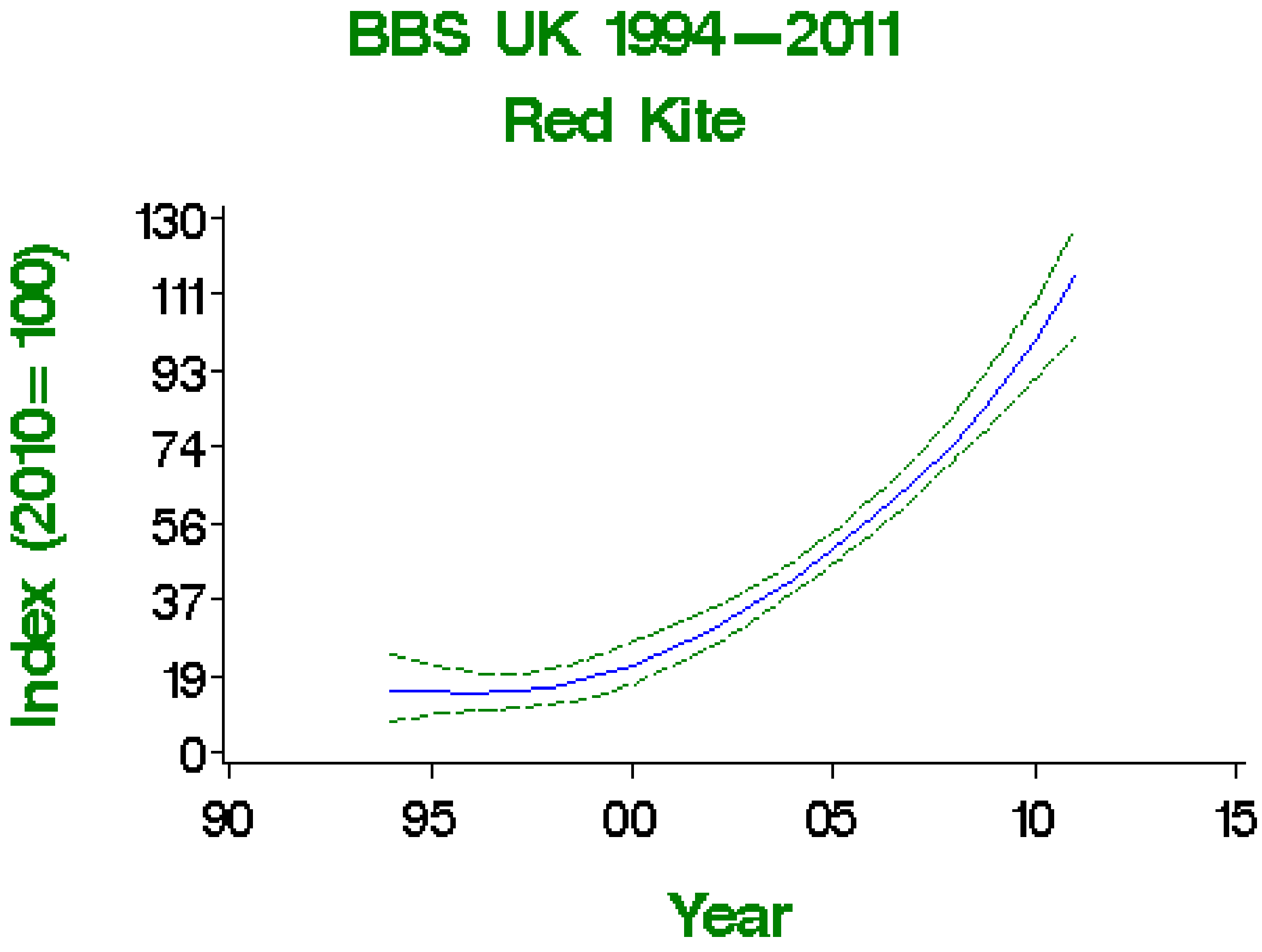
Milvus milvus

Key facts

Conservation listings:	Europe: SPEC category 2 (concentrated in Europe, declining) (BiE04) UK: amber (European decline) (BoCC3); an RBBP species
Long-term trend:	UK, England: rapid increase
Population size:	1,600 pairs in 2006-10 (APEP13: RBBP data); probably over 2,200 pairs in 2010 (Holling & RBBP 2012)

Status summary

Red Kite was historically widespread across Britain but, following widespread persecution, fewer than ten breeding pairs remained by the 1930s and 1940s, concentrated into a small area of mid Wales. Through careful husbandry organised by a 'Kite Committee' of local conservationists and landowners, including RSPB bounties paid to farmers for successful nests during 1922-90, the Welsh population rose to 100 pairs by 1993. Most birds were descended from a single female that had continued to breed successfully during the population bottleneck (Carter 2001). As a step towards restoring the original breeding range, birds were introduced in 1989 into the Chilterns (Oxfordshire and Buckinghamshire) and into the Black Isle in Easter Ross (Evans & Pienkowski 1991). Successful breeding populations quickly resulted in both areas. Further releases were begun in Northamptonshire in 1995, central Scotland in 1996, Yorkshire in 1999, Dumfries & Galloway in 2001, and northeast England in 2004. Each of these centres has given rise to a productive breeding group,in some cases benefiting from large-scale provision of food or the development of a well-established communal roost. Introduced birds and their offspring wander widely across Britain and Ireland but, as yet, pairs have been slow to set up breeding sites distant from the release areas. BBS sightings have shown an exponential rise since 1994. Illegal persecution is continuing and in northern Scotland has severely limited the growth of the Red Kite population (Smart et al. 2010).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

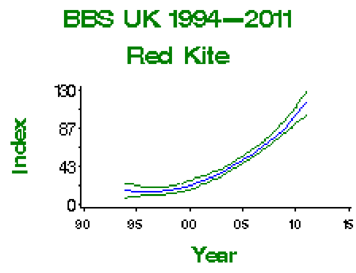
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	15	1995-2010	78	572	324	1157		

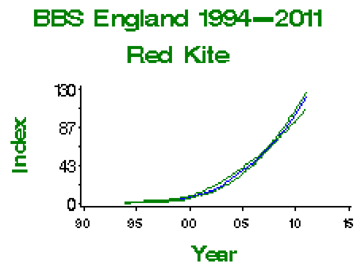
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	10	2000-2010	110	370	226	596		
	5	2005-2010	152	101	74	145		
BBS England	15	1995-2010	54	9598	4478	10864		
	10	2000-2010	78	1362	974	1979		
	5	2005-2010	113	173	127	223		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



BBS UK graph



BBS England graph

Demographic trends

Productivity and survival trends for this species are not currently produced by BTO

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Hen Harrier

Circus cyaneus

Key facts

Conservation listings:	Europe: SPEC category 3 (vulnerable) (BiE04) UK: red (historical decline) (BoCC3); an RBBP species
Long-term trend:	UK: probable increase
Population size:	630 (550-740) pairs in UK, and 29 on Isle of Man, in 2010 (APEP13: Holling & RBBP 2011b)

Migrant status:	Resident
Nesting habitat:	Ground nester
Primary breeding habitat:	Moorland
Secondary breeding habitat:	
Breeding diet:	Animal
Winter diet:	Animal

Status summary

This species was red listed because of substantial declines over the last two centuries. The UK population was unchanged between surveys in 1988-89 and 1998, with declines in Orkney and England but increases in Northern Ireland and the Isle of Man (Sim et al. 2001). A 41% increase was recorded in the UK and Isle of Man during 1998-2004, possibly due to increased use of non-moorland habitats, but with decreases in the Southern Uplands, east Highlands and England, all being areas with many managed grouse moors (Sim et al. 2007a). The latest survey, in 2010, reveals a decline of around 18% since the 2004 survey (Holling & RBBP 2012).

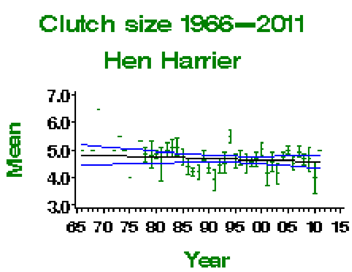
Population changes in detail

Annual breeding population changes for this species are not currently monitored by BTO

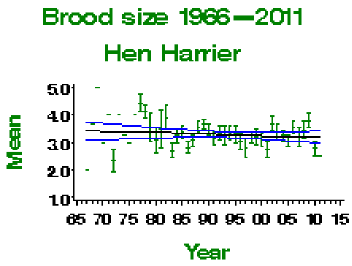
Demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Clutch size	42	1968-2010	12	None					Small sample
Brood size	42	1968-2010	19	None					Small sample
Nest failure rate at egg stage	42	1968-2010	10	Curvilinear	0.02% nests/day	0.06% nests/day	200.0%		Small sample
Nest failure rate at chick stage	42	1968-2010	13	None					Small sample

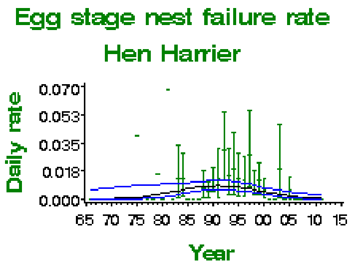
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



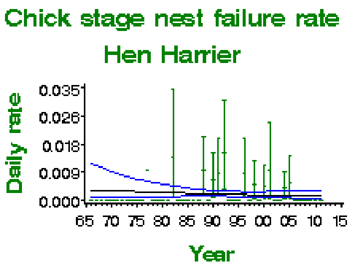
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

Causes of change

Based on multiple field studies providing good evidence, the main driver of declines in Hen Harrier populations appears to have been illegal persecution, causing a reduction in nesting success, annual productivity and survival of breeding females.

Change factor	Primary driver	Secondary driver
Demographic	Decreased breeding success	Decreased survival
Ecological	Other	

Further information on causes of change

Demographic data presented here show that clutch size decreased by 12% between 1968 and 2008 (although further investigation has shown that this trend is due to the increased proportions in recent years of records from Orkney, where clutch sizes tend to be smaller than on the mainland: Summers 1998, Crick 1998). The daily failure rate of nests at the egg stage have increased by 500%. However, this is based on extremely small sample sizes so these figures have to be treated with caution.

There is good evidence showing that, although the Hen Harrier has been protected under UK law since 1961, many are still unlawfully killed or disturbed in efforts to protect the economic viability of driven shooting of Red Grouse (Redpath & Thirgood 1997, Thompson et al. 2009). A study combining Atlas data and a two-year field study provided good evidence that nesting success, annual productivity and survival of female Hen Harriers was lower on grouse moors than on other moorland or in young conifer forests, due to destruction by humans (Bibby & Etheridge 1993, Etheridge et al. 1997). Fielding et al. (2011) conclude that illegal killing is the biggest single factor affecting the species and that it is having a dramatic impact on the population in core areas of its range in northern England and Scotland.

Recovery of the Welsh harrier population, in contrast to those elsewhere in the UK, has been attributed to an increase in the breeding productivity, apparently due to a combination of cessation of human interference in recent years and warmer temperatures, leading to increased productivity (Whitfield et al. 2008). Whitfield et al. (2008) also provide strong field-based evidence from the Welsh harrier population that human interference has been the primary driver of population change, through its impact on breeding productivity (specifically, an increased proportion of breeding females laying eggs, combined with a general increase in the average number of young fledged).

In areas where illegal persecution is minimal, food availability restricts numbers. Good-quality recent studies found that rough grass, a preferred habitat for field voles, is a critical foraging habitat for Orkney Hen Harriers (Amar & Redpath 2005, Amar et al. 2008a) and that habitat characteristics around harrier nest-sites (at a 1-km radius) can have a strong influence on breeding performance (Amar et al. 2002).

A field experiment showed that food shortage just before the laying period resulted in low levels of polygyny and reduced nesting success among secondary females, resulting in reduced productivity (Amar & Redpath 2002, Amar et al. 2005). The area of rough grassland has decreased during the same period as sheep numbers have increased and this is thought have reduced food supplies (Amar et al. 2003, 2005, Amar & Redpath 2005), but there was no detectable effect of rough grass area on fledging success or fledged brood size (Amar et al. 2008). Further, these studies provide no evidence that the effects on breeding success have an impact on abundance. However, Redpath et al. (2002a) present good evidence from a different field study in Scotland which also shows that food availability, notably numbers of field voles, can influence population change in Hen Harriers, where there is no persecution. Harrier densities were highest in areas and years where their small prey animals were most abundant. Clutch size was positively correlated with the number of field voles, although fledging success was not significantly correlated with the relative abundance of small prey (Redpath &Thirgood 1999, Redpath et al. 2002a). Madders (2000) also highlighted the importance of foraging habitat in Scotland, finding that the extent of young first-rotation forestry, the preferred foraging habitat in this area, is currently in decline and states that this has contributed to many of the reported changes in local Hen Harrier populations (although no specific research into demographic parameters were presented).

There is some evidence that climate also affects demography, although this is secondary to drivers outlined above and there is no evidence for effects on abundance. In Scotland, chick mortality increased in cold temperatures and annual values of harrier fledged brood size were positively related to summer temperature (Redpath et al. 2002b) and warmer temperatures led to increased productivity (in the absence of persecution) in Wales (Whitfield et al. 2008).

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Sparrowhawk

Accipiter nisus

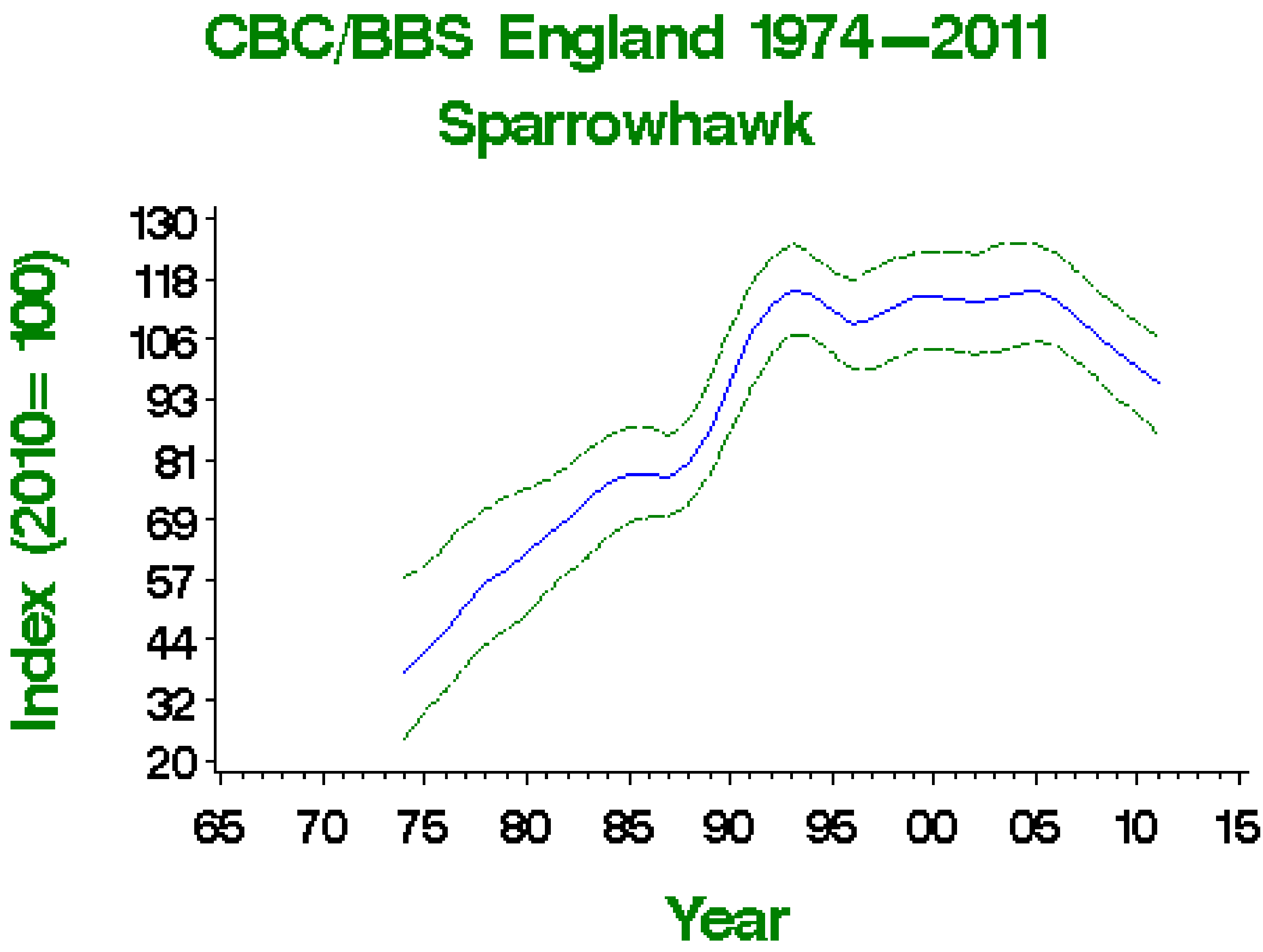
Key facts

Conservation listings:	Europe: no SPEC category (favourable conservation status in Europe, not concentrated in Europe) (BiE04) UK: green (BoCC3)
Long-term trend:	England: rapid increase
Population size:	35,000 pairs in 2009 (APEP13: 1988-91 Atlas estimate (Newton 1986) updated using CBC/BBS trend for England)

Migrant status:	Resident
Nesting habitat:	Above-ground nester
Primary breeding habitat:	Woodland
Secondary breeding habitat:	
Breeding diet:	Animal
Winter diet:	Animal

Status summary

Between the 1970s and the mid 1990s, the CBC charted a steep increase in this species. Many former haunts especially in the Midlands and east of England were reoccupied between the two atlas periods (Gibbons et al. 1993). The population has stabilised since the mid 1990s and more recently has begun to fall again. There has been little long-term change across Europe since 1980 (PECBMS 2012a).



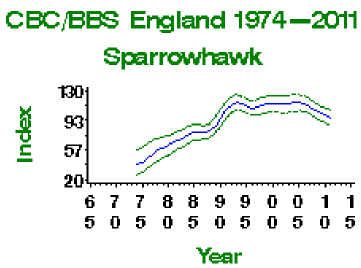
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

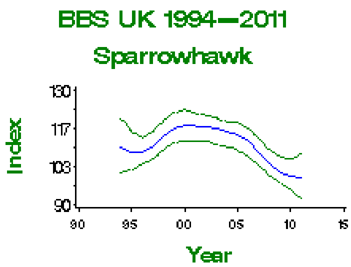
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	35	1975-2010	157	140	45	269		
	25	1985-2010	207	28	3	63		
	10	2000-2010	321	-13	-20	-3		
	5	2005-2010	360	-13	-21	-5		
BBS UK	15	1995-2010	346	-7	-16	3		
	10	2000-2010	383	-15	-22	-7		
	5	2005-2010	434	-13	-19	-4		
BBS England	15	1995-2010	283	-9	-20	-1		
	10	2000-2010	313	-13	-22	-4		
	5	2005-2010	351	-13	-21	-6		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

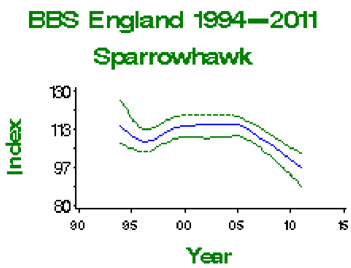
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



CBC/BBS England graph

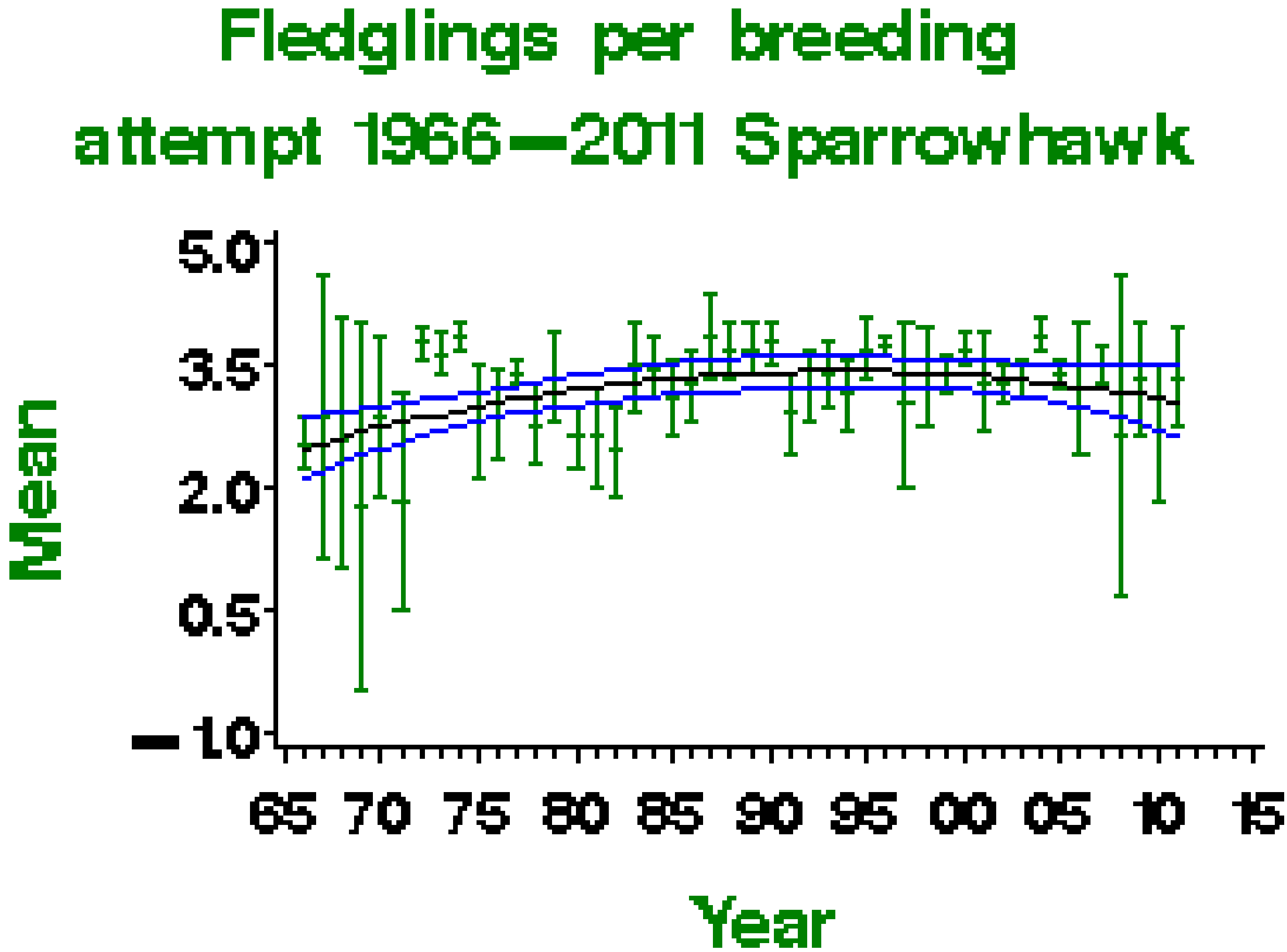


BBS UK graph

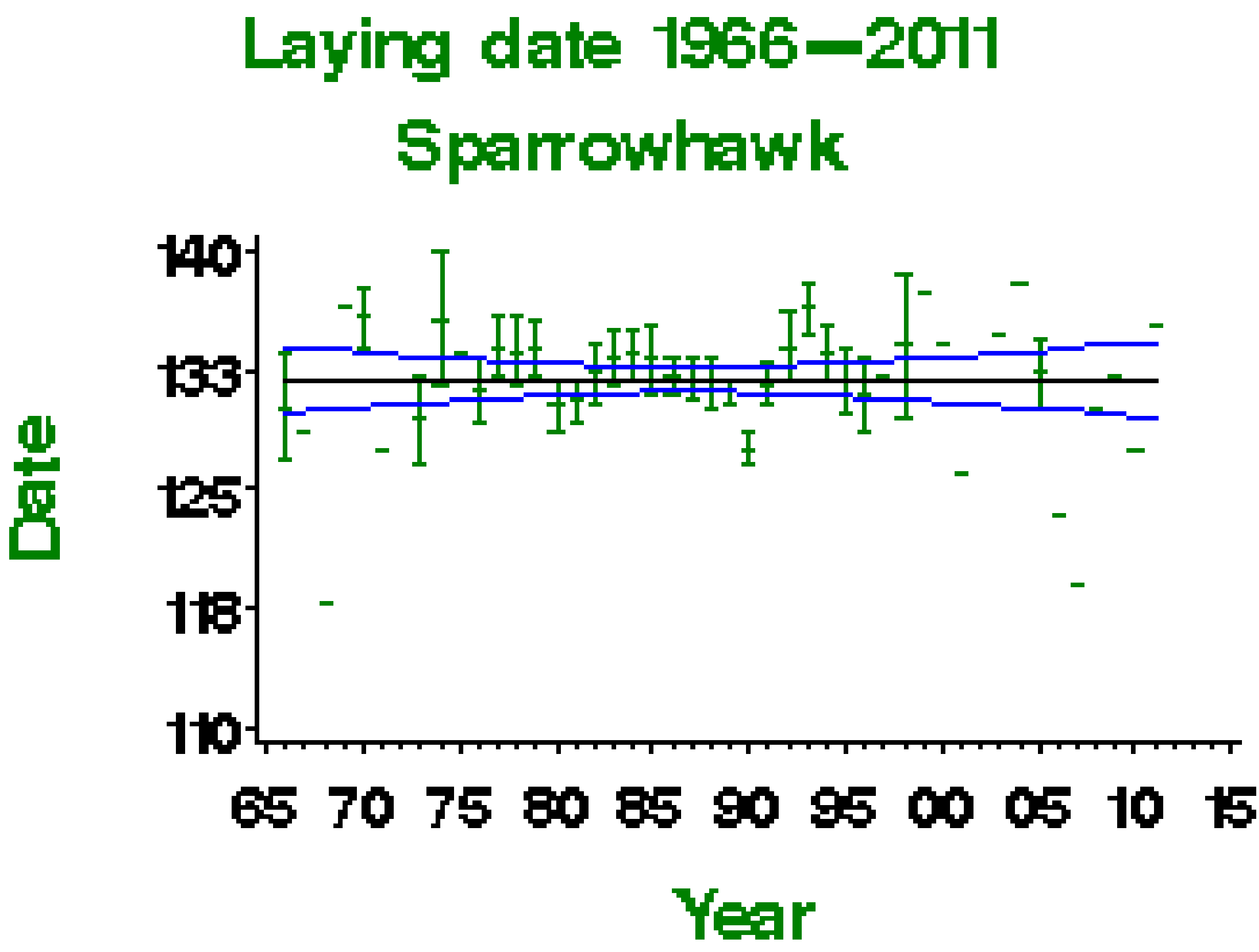


BBS England graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend



Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

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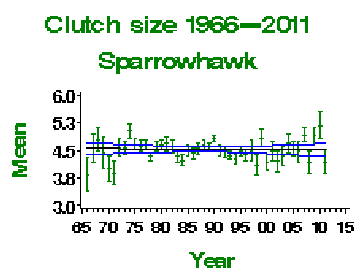
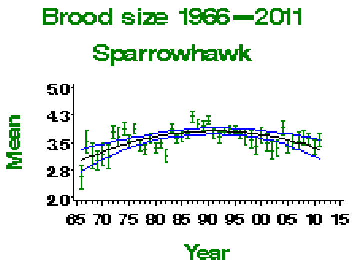
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	32	Curvilinear	2.63 fledglings	3.12 fledglings	18.9%		
Clutch size	42	1968-2010	34	None					
Brood size	42	1968-2010	69	Curvilinear	3.13 chicks	3.37 chicks	7.6%		
Nest failure rate at egg stage	42	1968-2010	32	Linear decline	0.46% nests/day	0.07% nests/day	-84.8%		
Nest failure rate at chick stage	42	1968-2010	45	None					
Laying date	42	1968-2010	13	None			0 days		Small sample

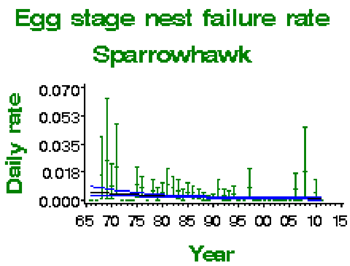
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



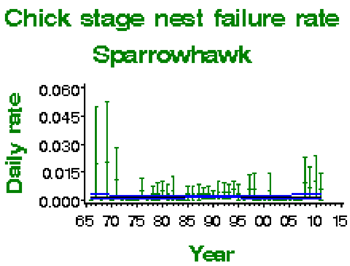
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

Causes of change

There is good evidence that improved breeding success due to a decline in organochlorine pesticide use is the most likely cause of the increase in this species, but that reduced survival, especially of young birds, may be driving the decline in Scottish populations.

Change factor	Primary driver	Secondary driver
Demographic	Increased breeding success	Increased survival
Ecological	Other	

Further information on causes of change

Sparrowhawks suffered a severe population crash caused by organochlorine pesticides in the 1950s and 1960s, when the species was extinguished from large areas of lowland Britain (Newton 1986). Studies of this species in eastern England confirmed this, and the recovery of the Sparrowhawk in this area was primarily dependent on declining organochlorine contamination which resulted in an improvement of breeding success mainly due to an increase in hatching success, itself associated with improved eggshell thickness and reduced egg breakage (Newton & Wyllie 1992). The figures above support this, showing improving numbers of fledglings per breeding attempt, a fall in failure rates at the egg stage and increases in brood size.

Comparison of an increasing population in east-central England with stable and decreasing populations in southern Scotland showed that differences in population trend were associated mainly with differences in the recruitment of new breeders (greatest in the increasing and lowest in the decreasing population) and in age of first breeding (earliest in the increasing and latest in the decreasing population). There were also differences in the annual survival of breeders (greater in the increasing population) while differences in breeding success between areas were slight and non-significant (Wyllie & Newton 1991). A comprehensive long-running study of Sparrowhawks in Scotland during 1972-86 provides further detailed evidence. Overwinter loss operating in the period between the fledging of young and subsequent recruitment to the breeding population was identified as the key factor, explaining 77% of the variance in total annual loss, and largely accounting for the pattern of change in breeding numbers (Newton 1988). Work by Newton & Marquiss (1986) found that annual survival of established breeders and breeding performance was the same in both a declining and increasing population, but that recruitment of incoming breeders was lower in the declining population and state that this was the main proximate cause of decline.

The population has stabilised since the mid 1990s and, possibly through the effects of intraspecific competition, average brood size has begun to fall again (see above).

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Buzzard

Buteo buteo

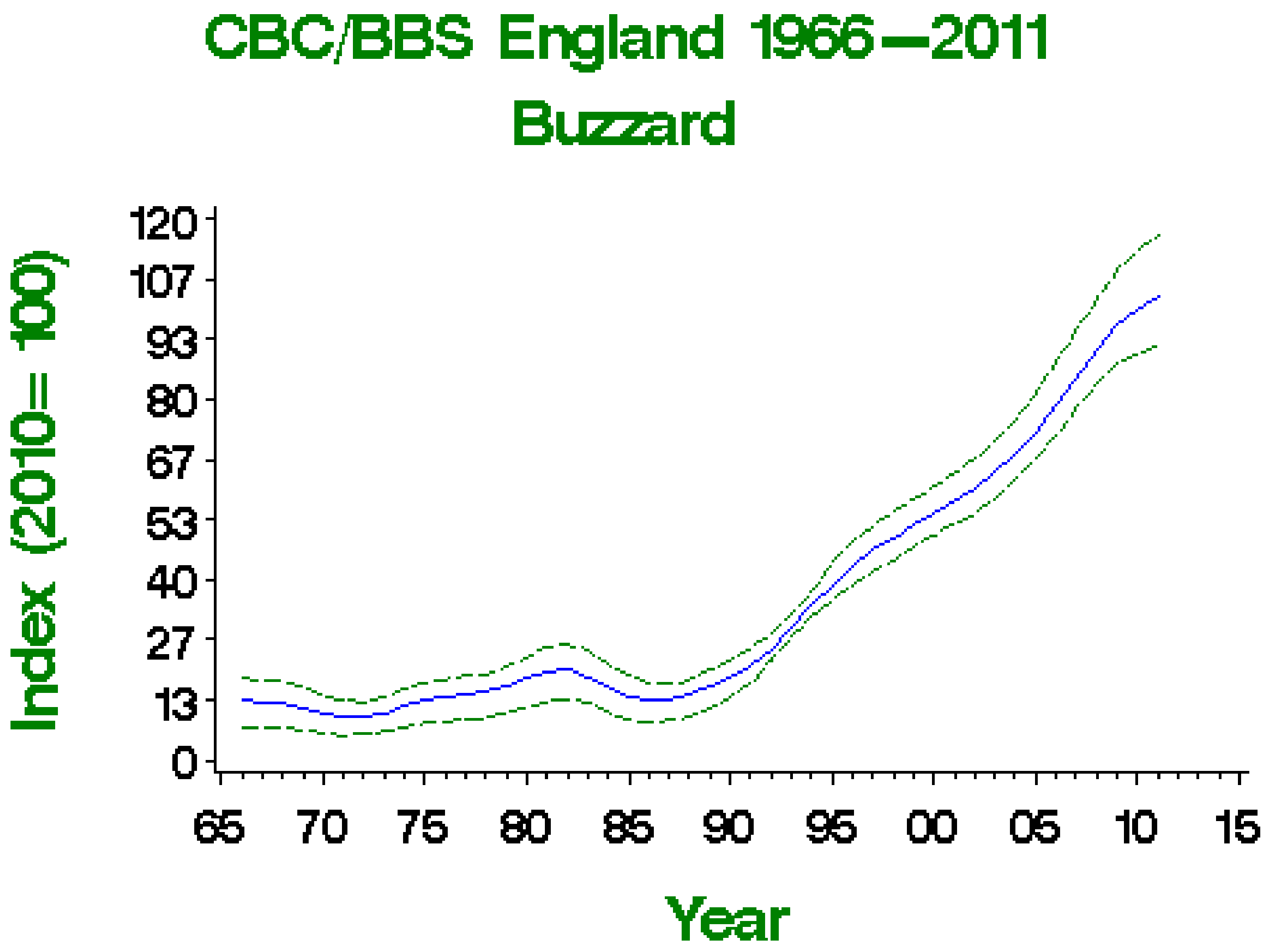
Key facts

Conservation listings:	Europe: no SPEC category (favourable conservation status in Europe, not concentrated in Europe) (BiE04) UK: green (BoCC3)
Long-term trend:	England: rapid increase
Population size:	57,000-79,000 pairs in 2009 (APEP13: 2001 estimate (Clements 2002) updated using BBS trend)

Migrant status:	Resident
Nesting habitat:	Above-ground nester
Primary breeding habitat:	Woodland
Secondary breeding habitat:	Farmland
Breeding diet:	Animal
Winter diet:	Animal

Status summary

The Common Buzzard has shown a substantial eastward range expansion since the 1988-91 Atlas, and for a decade or more has been the most abundant raptor in the UK (Clements 2002). The increasing trend identified by the CBC relates especially to the spread of range into central and eastern Britain, where CBC was more strongly represented. If anything, however, the upsurge has been amplified with the addition of the more widely representative BBS data since 1994. The BBS PECBMS 2012a).



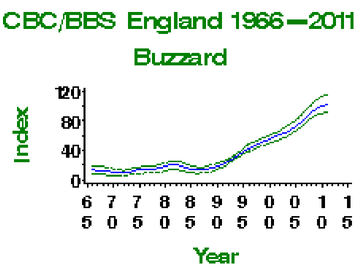
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

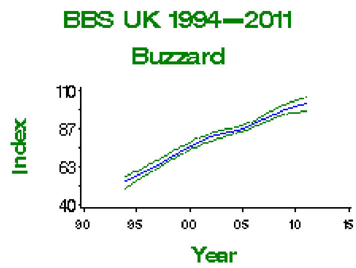
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	43	1967-2010	216	670	413	1736		Small CBC sample
	25	1985-2010	364	602	348	1229		
	10	2000-2010	741	82	69	100		
	5	2005-2010	938	37	30	43		
BBS UK	15	1995-2010	885	75	60	91		
	10	2000-2010	1099	32	22	42		
	5	2005-2010	1341	15	10	21		
BBS England	15	1995-2010	575	153	124	185		
	10	2000-2010	738	83	69	100		
	5	2005-2010	938	37	30	42		
BBS Scotland	15	1995-2010	141	33	9	70		
	10	2000-2010	163	-9	-21	9		
	5	2005-2010	190	-3	-13	8		
BBS Wales	15	1995-2010	140	4	-12	26		
	10	2000-2010	160	1	-13	17		
	5	2005-2010	167	-3	-13	9		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

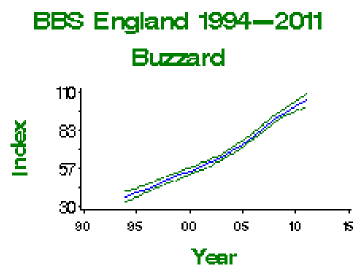
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



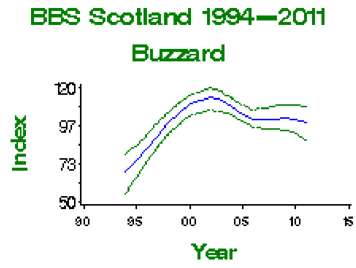
CBC/BBS England graph



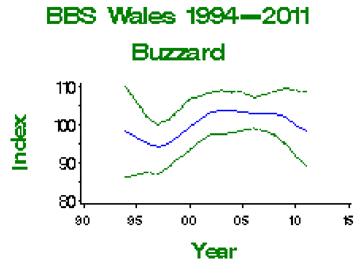
BBS UK graph



BBS England graph

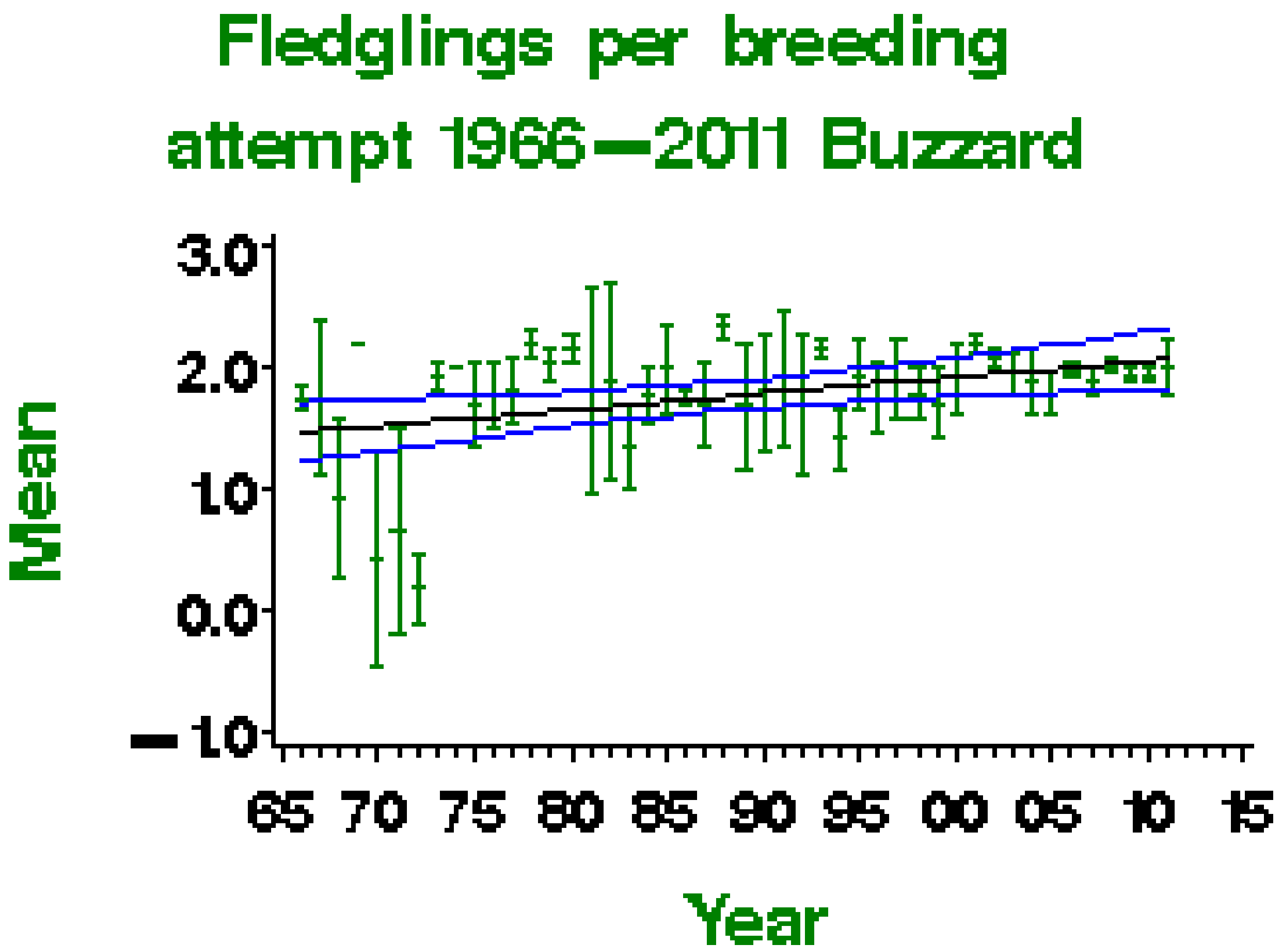


BBS Scotland graph

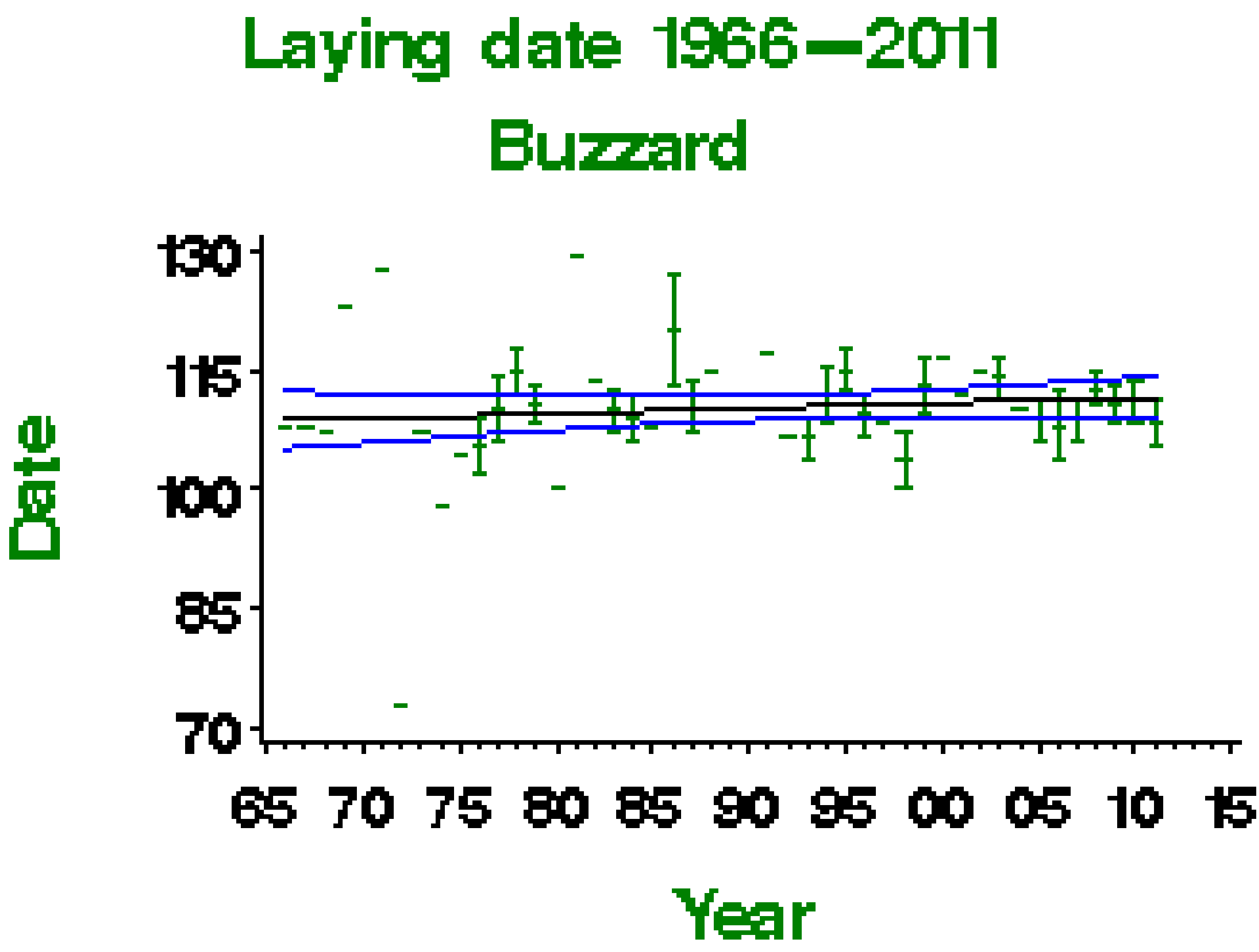


BBS Wales graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend



Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

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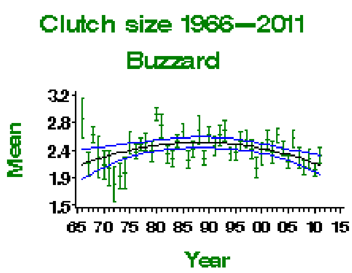
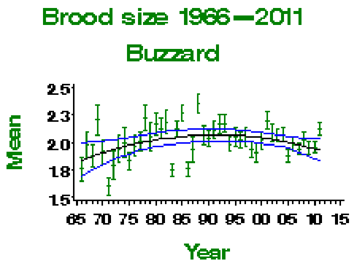
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	28	Linear increase	1.51 fledglings	2.07 fledglings	36.6%		
Clutch size	42	1968-2010	34	Curvilinear	2.19 eggs	2.15 eggs	-1.7%		
Brood size	42	1968-2010	107	Curvilinear	1.88 chicks	1.95 chicks	3.8%		
Nest failure rate at egg stage	42	1968-2010	28	Linear decline	0.86% nests/day	0.05% nests/day	-94.2%		Small sample
Nest failure rate at chick stage	42	1968-2010	53	None					

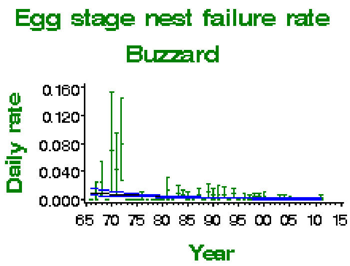
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



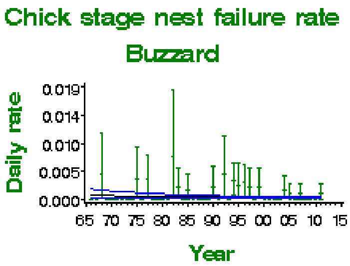
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

Causes of change

There is good evidence that the increase in population numbers is associated with rapidly improving nesting success, which has been linked to reduced persecution (and therefore improved survival) and increased food supplies due to the recovery of rabbit populations from the effects of myxomatosis. It is not possible to say which is the more important driver.

Change factor	Primary driver	Secondary driver
Demographic	Improved breeding success	Increased survival
Ecological	Other	

Further information on causes of change

As the figures above show, there has been an increase in the number of fledglings per breeding attempt and a decrease in daily failure rates at the egg stage. As such, the increase in population numbers has been associated with rapidly improving nesting success, through reduced persecution, the recovery of rabbit populations from the effects of myxomatosis and release from the deleterious effects of organochlorine pesticides (Elliott & Avery 1991, Clements 2002, Sim et al. 2000, 2001a). Numbers of Buzzard were relatively stable until the late 1980s when the population size began increasing steeply. Elliott & Avery (1991) analysed data collected by the RSPB to provide good evidence that, during 1975-89, persecution was a factor in restricting the Buzzard's range. Halley (1993) found that levels of persecution in Scotland had fallen and postulated that this was a factor in the increase in Buzzard population size. In a study of two local populations in Scotland, Swann & Etheridge (1995) provided some evidence to show that persecution was a factor in restricting population density at the site which benefited from higher productivity, although they did not specifically analyse the effects of persecution. Sim et al. (2000) provide good evidence from Buzzard populations in the west Midlands that persecution levels, especially poisonings, were lower in the 1990s when the population started increasing and state that higher survival rate due to reduced persecution was likely to be one of the main factors responsible for the rapid increase in the Buzzard population in this area. Gibbons et al. (1995) found that Buzzards were less common in the uplands were grouse moors were most frequent, stating that this was due to either persecution, unsuitable habitat management or lack of food, although did not specify which was the most important driver.

There is also good evidence to support the role of changing food availability in population increases. Graham et al. (1995) showed that Buzzard breeding density was positively related to lagomorph abundance and Swann & Etheridge (1995) found that Buzzards laid larger clutches, produced bigger broods and had significantly higher productivity where rabbits were more common. Sim et al. (2000, 2001a) also provided good evidence that increased productivity coincided with an increase in rabbit abundance. Other studies have also found that breeding success is related to food availability (Kostrzewa & Kostrzewa 1991, Austin & Houston 1997, Goszczynski 1997, 2001). It is, therefore, plausible that Buzzard distribution is influenced by rabbit abundance, which has increased since increased since rabbits have overcome the effects of myxomatosis.

Habitat change may have played some role in the increases. High Buzzard breeding densities were associated with high proportions of unimproved pasture and mature woodland within estimated territories (Sim et al. 2000) and Sergio et al. (2002, 2005) found that Buzzard productivity benefited from the conversion of coppice woodland to mature forest in Italy. There is also some evidence that breeding success is related to climate, although there is little evidence for this from the UK. In Germany, Kostrzewa & Kostrzewa (1990) provide evidence to show that the number of young fledged was negatively correlated with rainfall in April and May. Although there is no evidence to support this, it is worth noting that these possible habitat/climate effects and food effects are not mutually exclusive.

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Kestrel

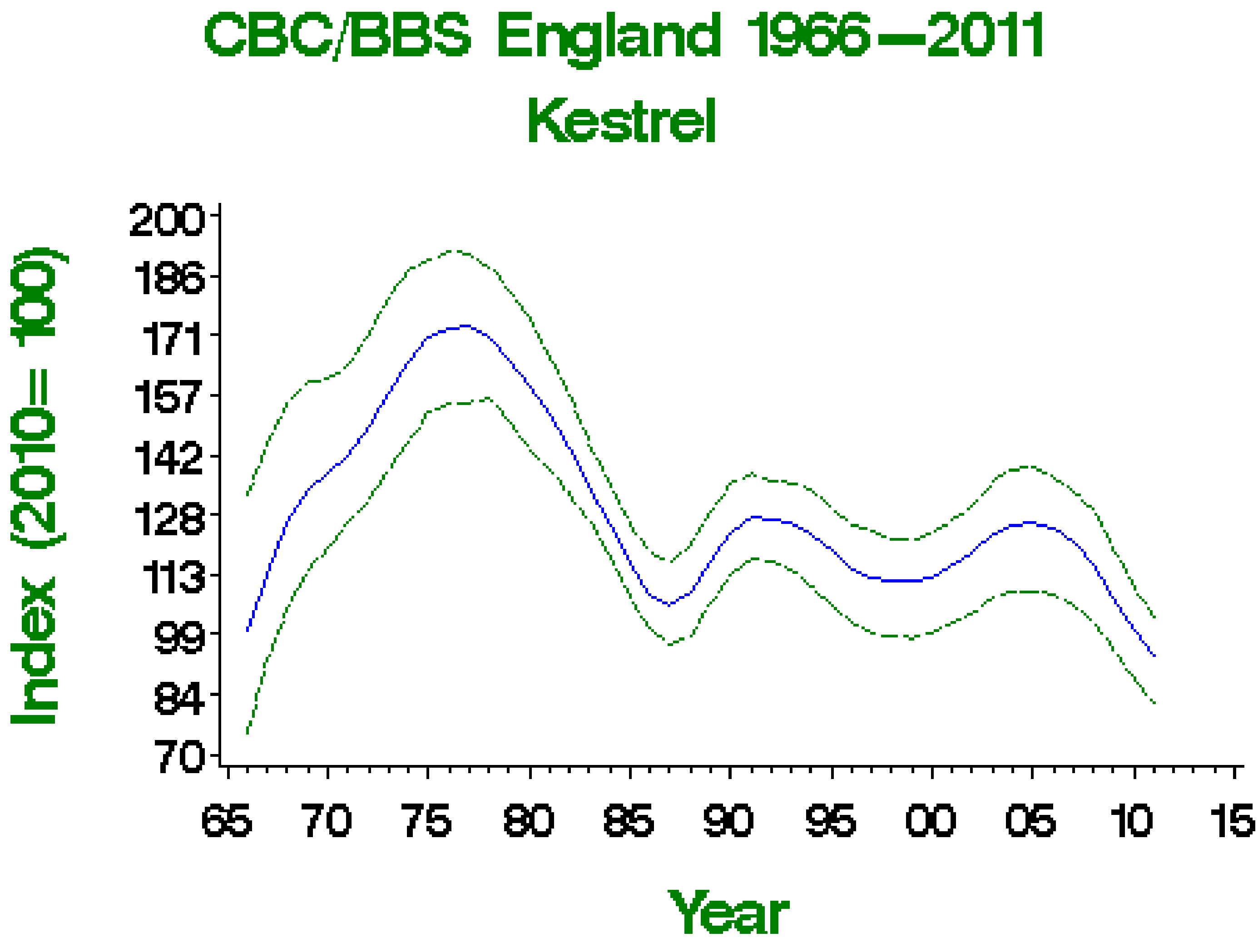
Falco tinnunculus

Key facts

Conservation listings:	Europe: SPEC category 3 (declining) (BiE04) UK: amber (25-50% population decline) (BoCC3)
Long-term trend:	England: fluctuating, with no long-term trend
Population size:	46,000 pairs in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend for England)

Status summary

Kestrels had recovered from the lethal and sublethal effects of organochlorine pesticides by the mid 1970s, the recovery probably driven by improving nesting success, but subsequently entered a decline which has been linked to the effects of agricultural intensification on farmland habitats and their populations of small mammals (Gibbons et al. 1993). Since the mid 1980s, the English population has fluctuated without a long-term trend being apparent. In Scotland, however, there has been a significant decline since 1994. The BBS Leech & Barimore 2008). Despite its decline since the mid 1970s, the Kestrel breeds at high density in mixed farmland across much of England, suggesting that the British population may number more than 50,000 pairs (Clements 2008). A moderate decrease has been recorded in the Republic of Ireland since 1998 (Crowe et al. 2010). There has been widespread moderate decrease across Europe since 1980 (PECBMS 2012a).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	43	1967-2010	268	-12	-39	26		
	25	1985-2010	404	-13	-29	1		
	10	2000-2010	648	-11	-16	-4		
	5	2005-2010	748	-20	-24	-15		

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	15	1995-2010	645	-32	-39	-25	>25	
	10	2000-2010	705	-21	-27	-13		
	5	2005-2010	801	-26	-31	-21	>25	
BBS England	15	1995-2010	565	-17	-22	-10		
	10	2000-2010	622	-11	-17	-4		
	5	2005-2010	713	-20	-24	-15		
BBS Scotland	15	1995-2010	42	-64	-76	-44	>50	
	10	2000-2010	41	-48	-66	-21	>25	
	5	2005-2010	42	-46	-62	-20	>25	

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

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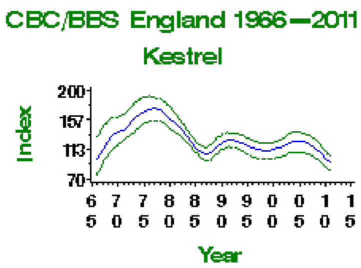
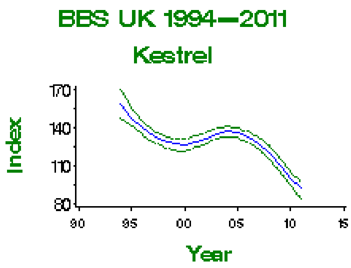
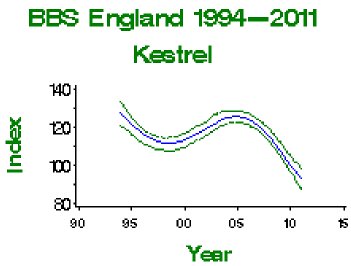


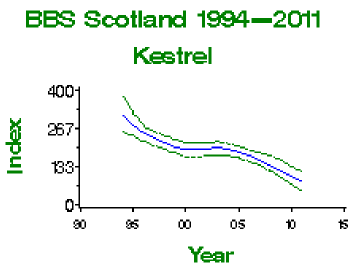
CBC/BBS England graph



BBS UK graph

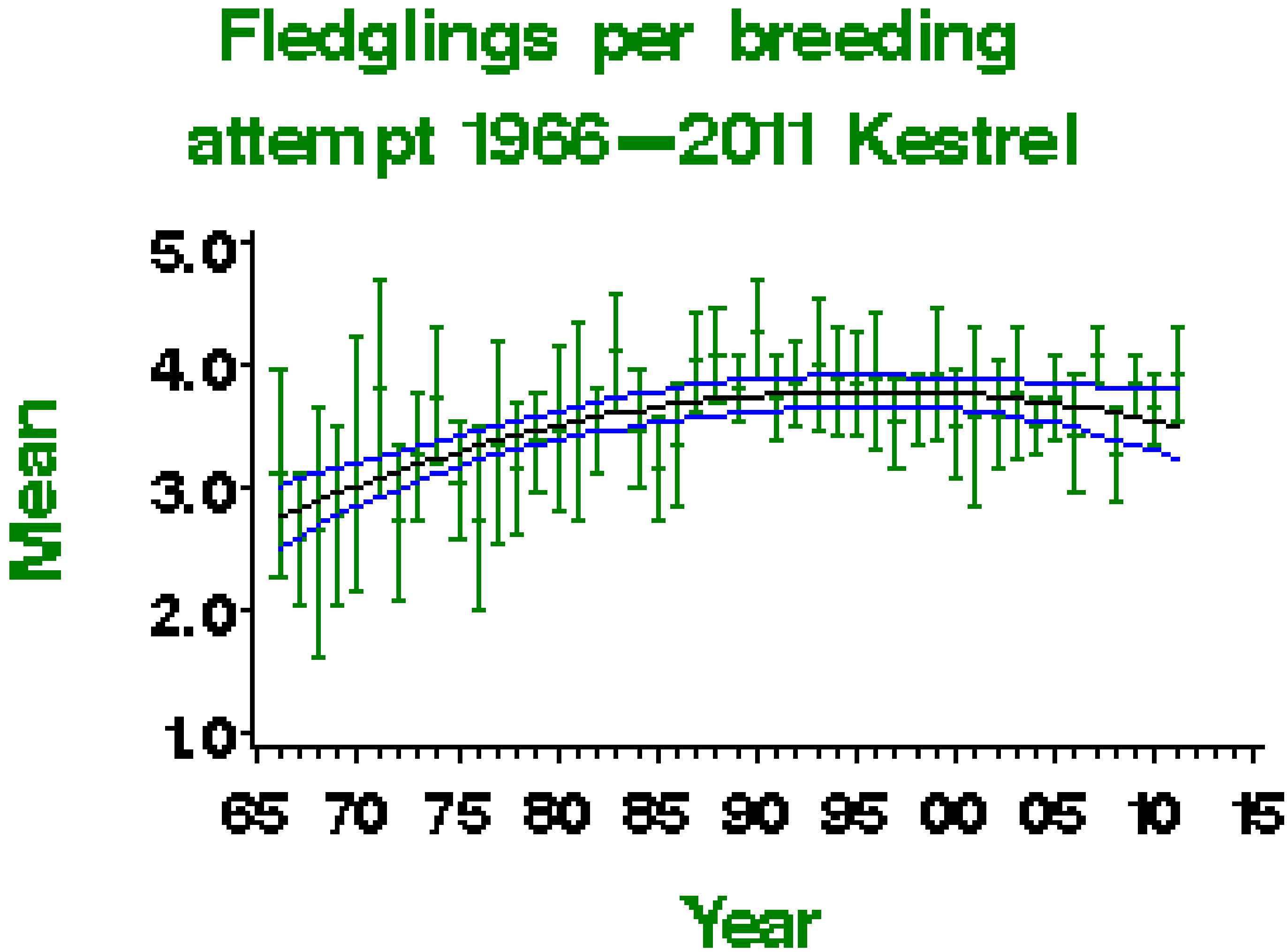


BBS England graph

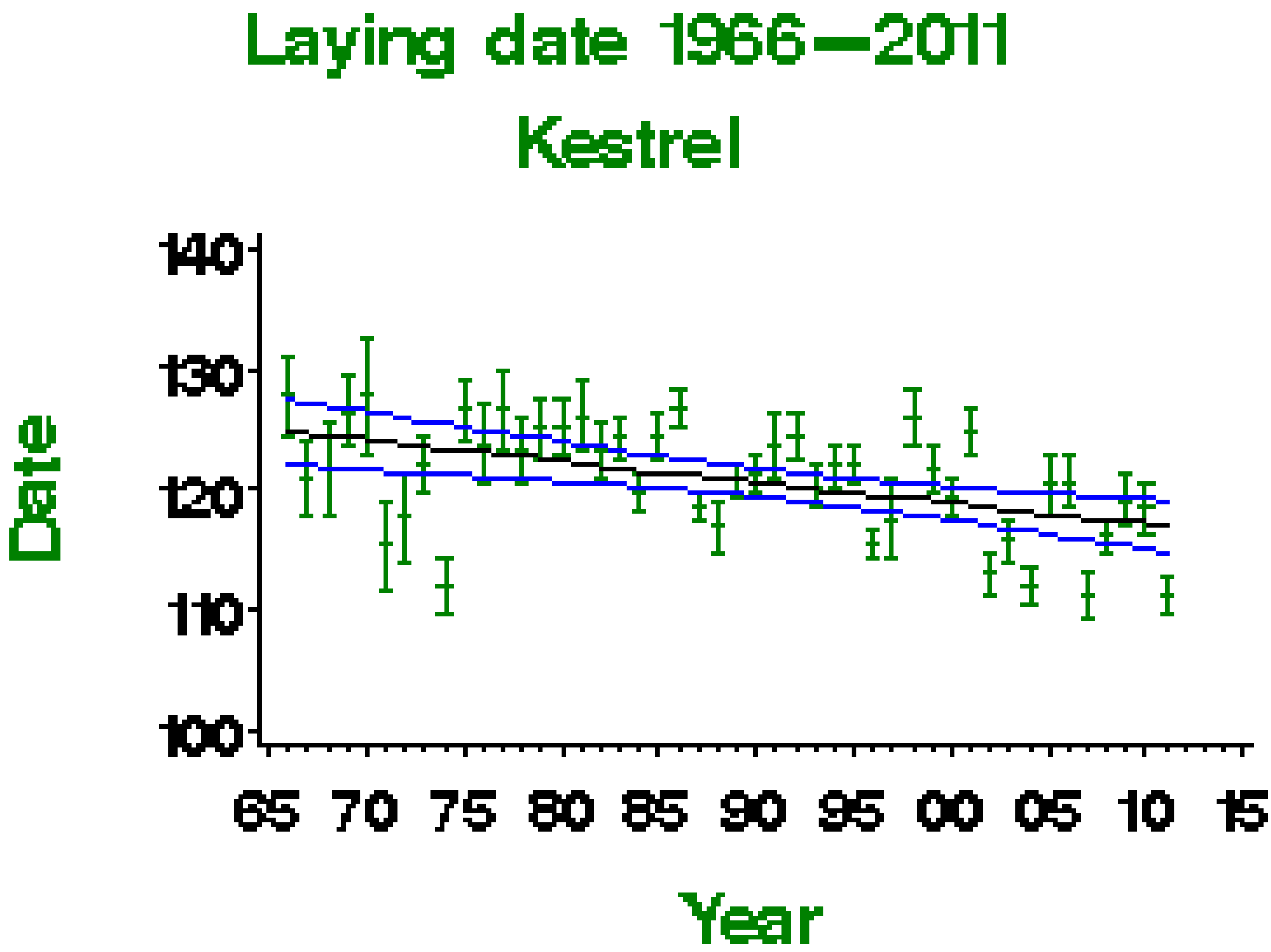


BBS Scotland graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

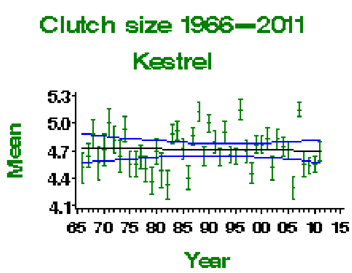


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

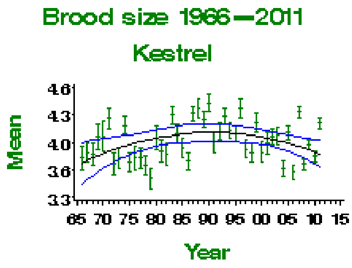
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	41	Curvilinear	2.91 fledglings	3.57 fledglings	22.6%		
Clutch size	42	1968-2010	58	None					
Brood size	42	1968-2010	143	Curvilinear	3.77 chicks	3.84 chicks	2.0%		
Nest failure rate at egg stage	42	1968-2010	41	Linear decline	0.59% nests/day	0.06% nests/day	-89.8%		
Nest failure rate at chick stage	42	1968-2010	69	Linear decline	0.21% nests/day	0.09% nests/day	-57.1%		
Laying date	42	1968-2010	23	Linear decline	May 4	Apr 27	-7 days		Small sample

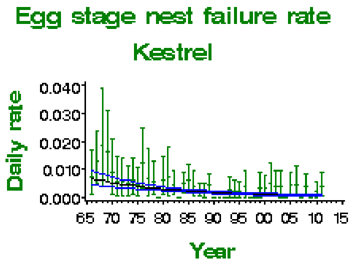
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



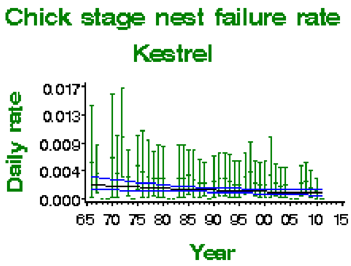
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

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Merlin

Falco columbarius

Key facts

Conservation listings:	Europe: no SPEC category (favourable conservation status in Europe, not concentrated in Europe) (BiE04) UK: amber (historical decline) (BoCC3); an RBBP species
Long-term trend:	UK: probable increase
Population size:	1,200 (900-1,500) pairs in 2008 (APEP13: Ewing et al. 2011)

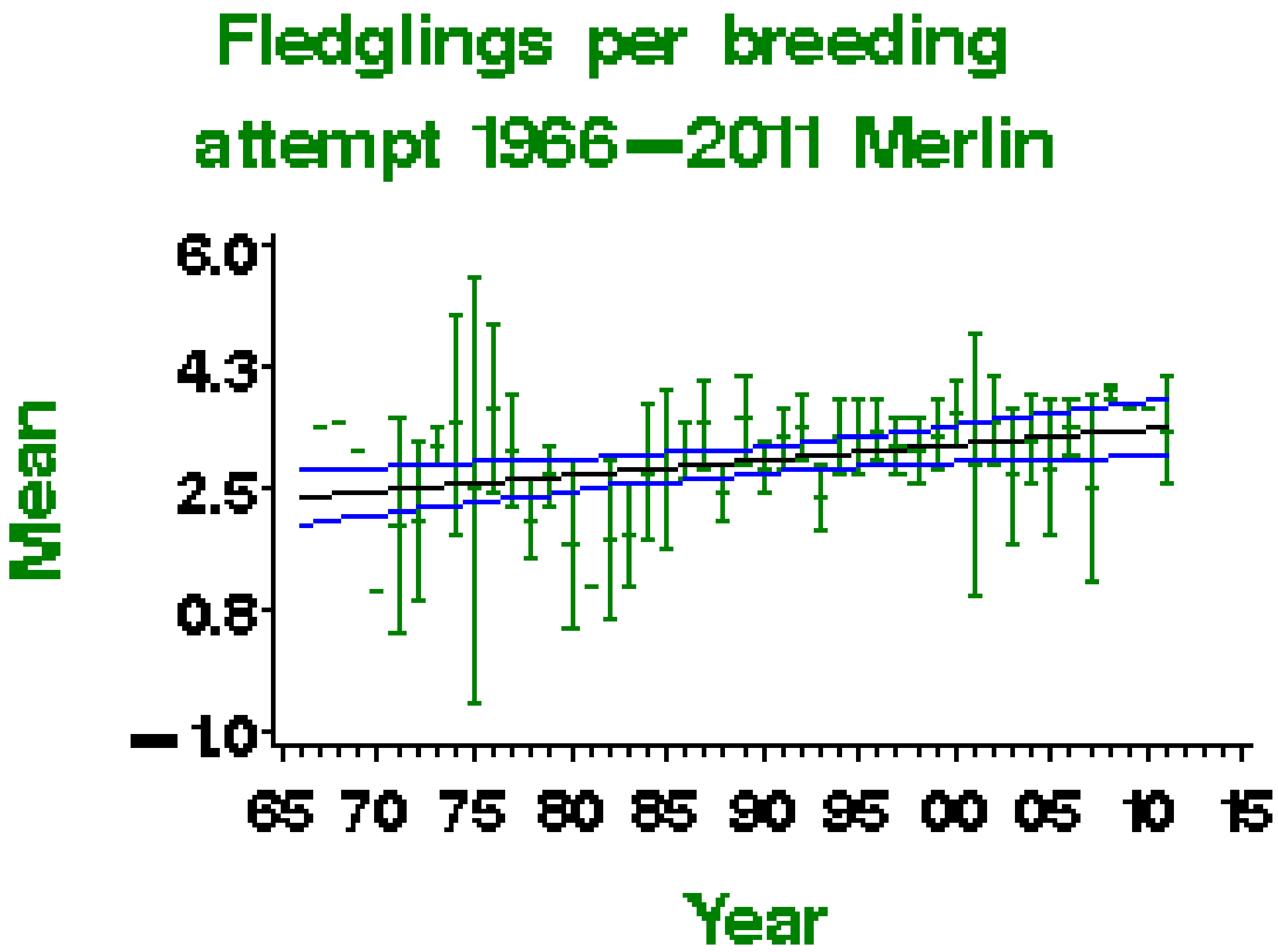
Status summary

Having declined substantially over the past two centuries, Merlin shows indications of a recent doubling of population (Rebecca & Bainbridge 1998). This increase may be associated with an increased use of forest edge as a nesting habitat (Parr 1994, Little et al. 1995, Rebecca 2011). Because of its recent population upturn, the species was moved from the red to the amber list in 2002. It remains much too scarce, however, for annual population monitoring via BBS: dedicated observers and specialised field methods are required, as described by Hardey et al. (2009). Submissions to the Rare Breeding Birds Panel fall well short of the estimated UK total population but show an average of 1.86 young fledged per occupied territory during 1996-2004 (Holling & RBBP 2007a). Breeding performance has tended to improve since the 1960s, probably linked to the declining influence of organochlorine pesticides (Crick 1993). Hatching rates in the southeast Yorkshire Dales were consistently higher than had been recorded in earlier studies in Northumberland (Wright 2005). A repeat survey of Merlin's British breeding status undertaken in 2008 found a non-significant decline of around 13% since the previous survey in 1993-94, with decline most noticeable in northern England (Ewing et al. 2011).

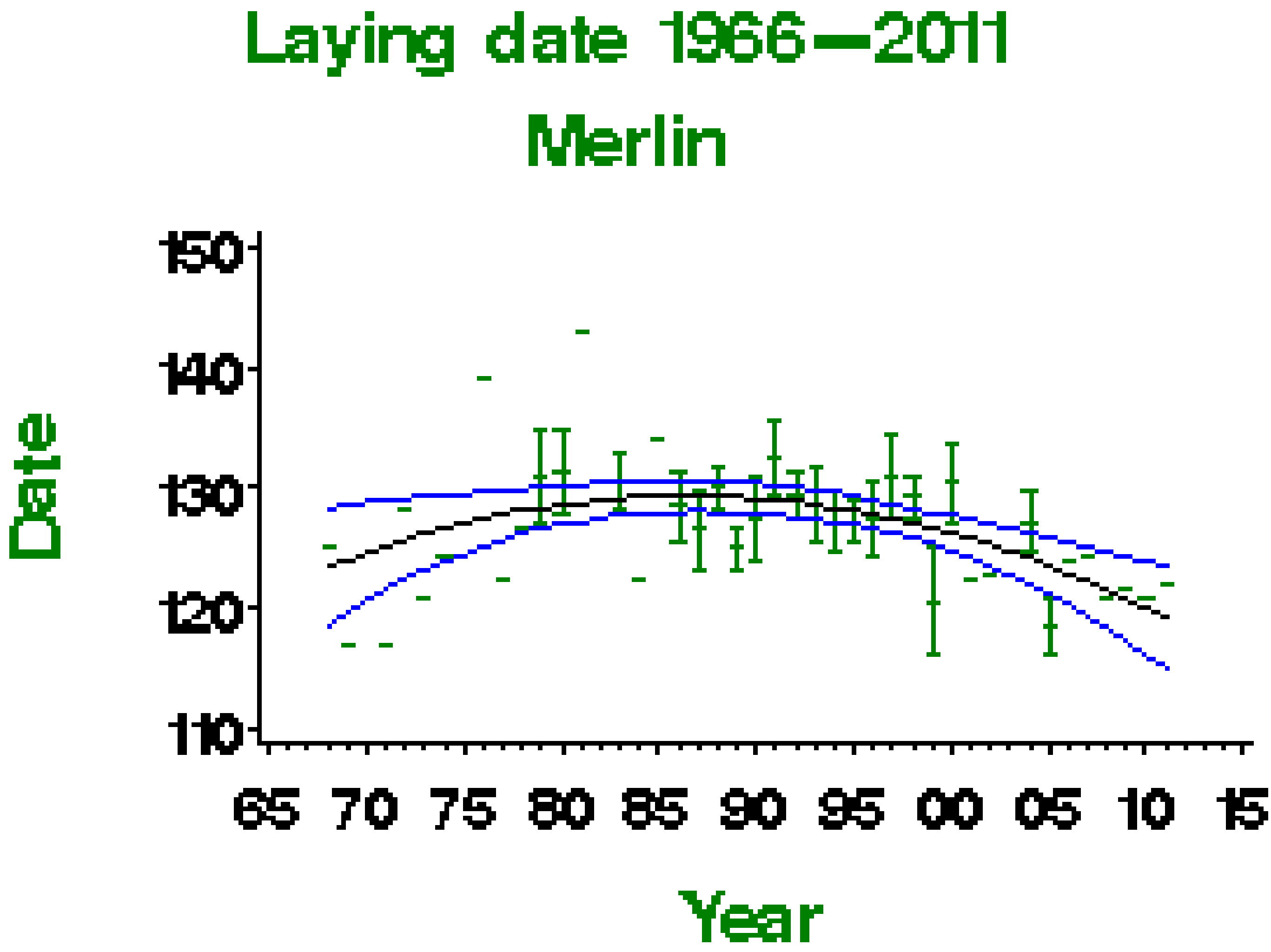
Population changes in detail

Annual breeding population changes for this species are not currently monitored by BTO

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend



Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

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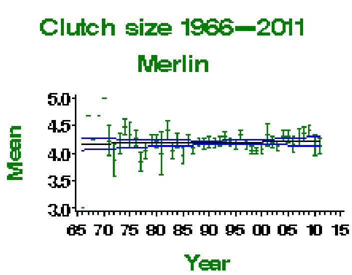
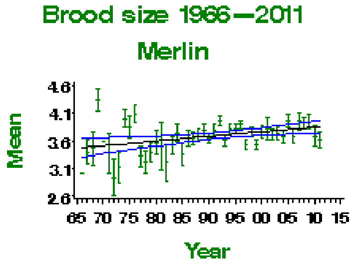
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	22	Linear increase	2.44 fledglings	3.36 fledglings	37.9%		
Clutch size	42	1968-2010	36	None					
Brood size	42	1968-2010	55	Linear increase	3.49 chicks	3.84 chicks	10.1%		
Nest failure rate at egg stage	42	1968-2010	24	Linear decline	0.71% nests/day	0.18% nests/day	-74.6%		Small sample
Nest failure rate at chick stage	42	1968-2010	28	Linear decline	0.90% nests/day	0.23% nests/day	-74.4%		Small sample

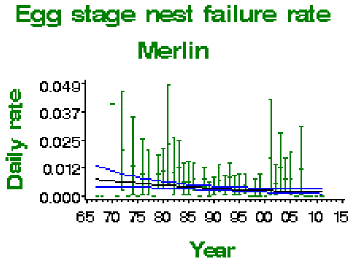
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



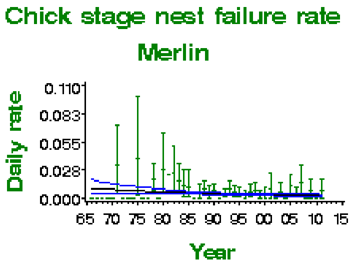
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



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Hobby

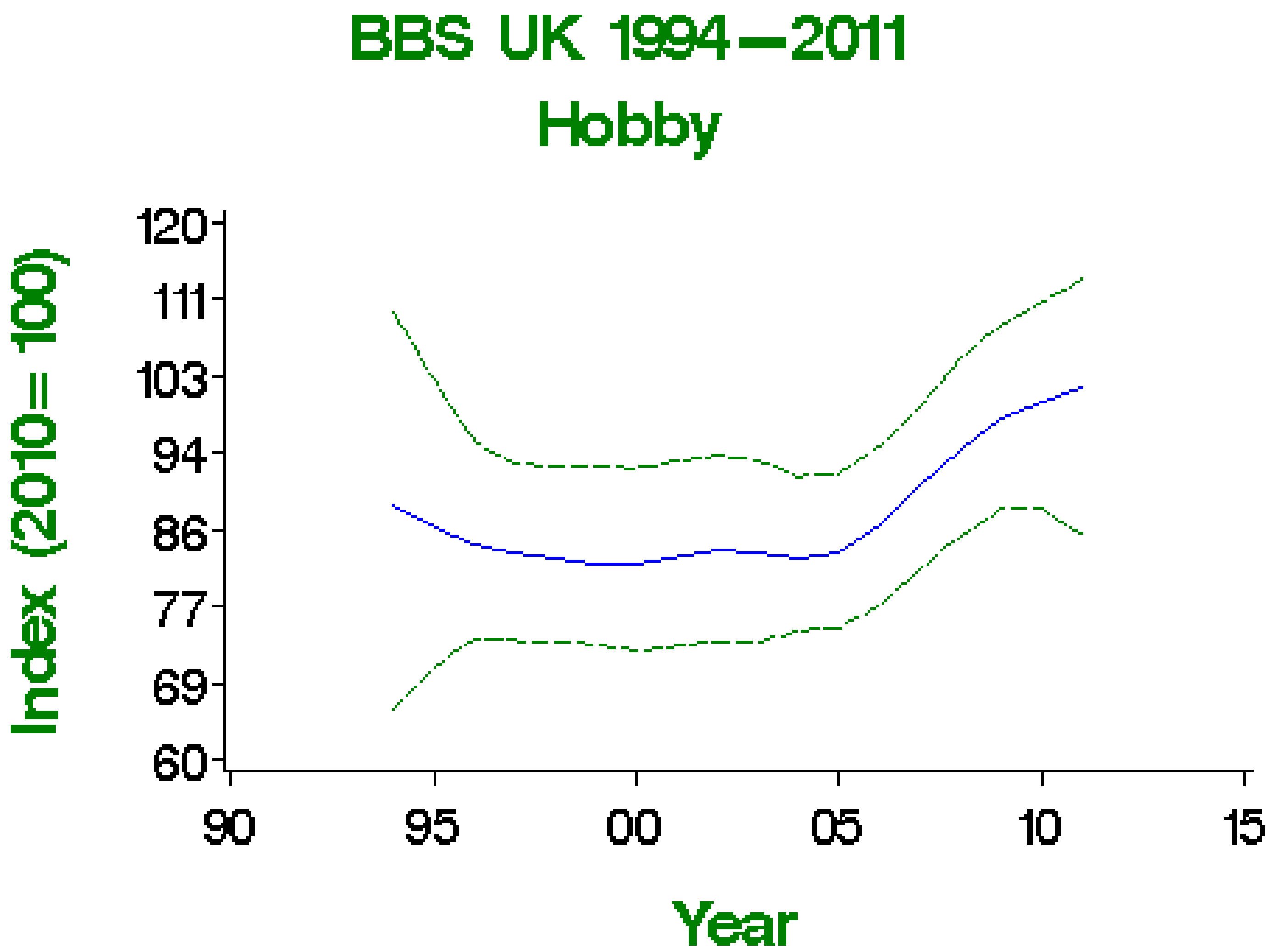
Falco subbuteo

Key facts

Conservation listings:	Europe: no SPEC category (favourable conservation status in Europe, not concentrated in Europe) (BiE04) UK: green (BoCC3); an RBBP species
Long-term trend:	UK, England: increase
Population size:	2,800 pairs in 2009 (APEP13: 2000 estimate (Clements 2001) updated using BBS trend)

Status summary

This species used to be too rare and unobtrusive to be monitored but, following population increase, BBS is now able to produce a trend. Many BBS sightings must, however, refer to migrants, first-summer non-breeders, or to breeding birds from distant nests. To establish whether nesting occurs in a locality, dedicated observers and specialised field methods are required, as described by Hardey et al. (2009). The Rare Breeding Birds Panel collects annual data on nesting pairs, which under-represent the true population to unknown degrees, but adequately establish the long-term upward trend (eg Holling & RBBP 2012). Numbers in parts of southeast England could be considerably higher than previously recognised (Clements & Everett 2011). The Hobby''s distribution has spread markedly northwards in England since the 1970s (Gibbons et al. 1993), perhaps linked to increases in its dragonfly prey supplies (Prince & Clarke 1993) and to a decreasing dependency on its traditional heathland habitat, but the reasons underlying the increase are still only speculative (Clements 2001). A success rate of more than 90% was recorded for nests in Derbyshire during 1992-2001, with successful nests fledging a mean of 2.44 young (Messenger & Roome 2007). The small annual samples of nest record cards indicate no long-term change in either brood size or nest success.



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

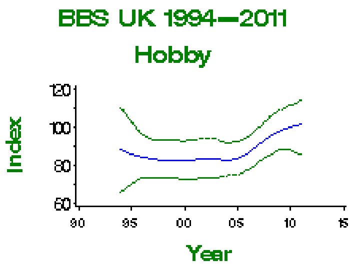
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	15	1995-2010	40	16	-14	57		
	10	2000-2010	46	22	-7	50		

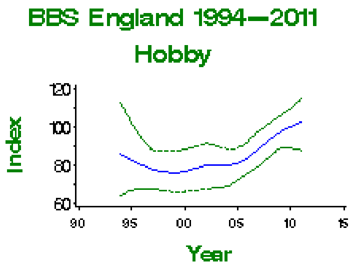
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	5	2005-2010	54	20	1	47		
BBS England	15	1995-2010	39	21	-8	66		
	10	2000-2010	45	30	1	62		
	5	2005-2010	52	24	4	51		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



BBS UK graph

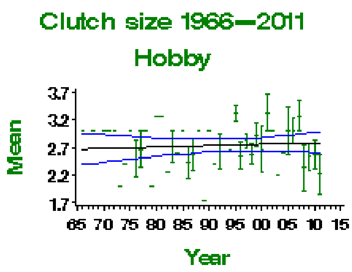


BBS England graph

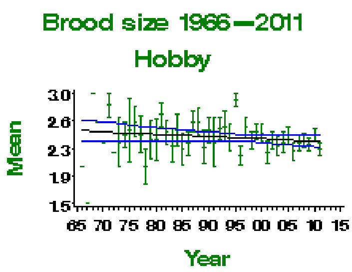
Demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Brood size	42	1968-2010	23	None					Small sample
Nest failure rate at chick stage	42	1968-2010	14	None					Small sample

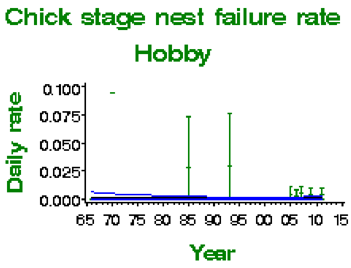
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

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Peregrine

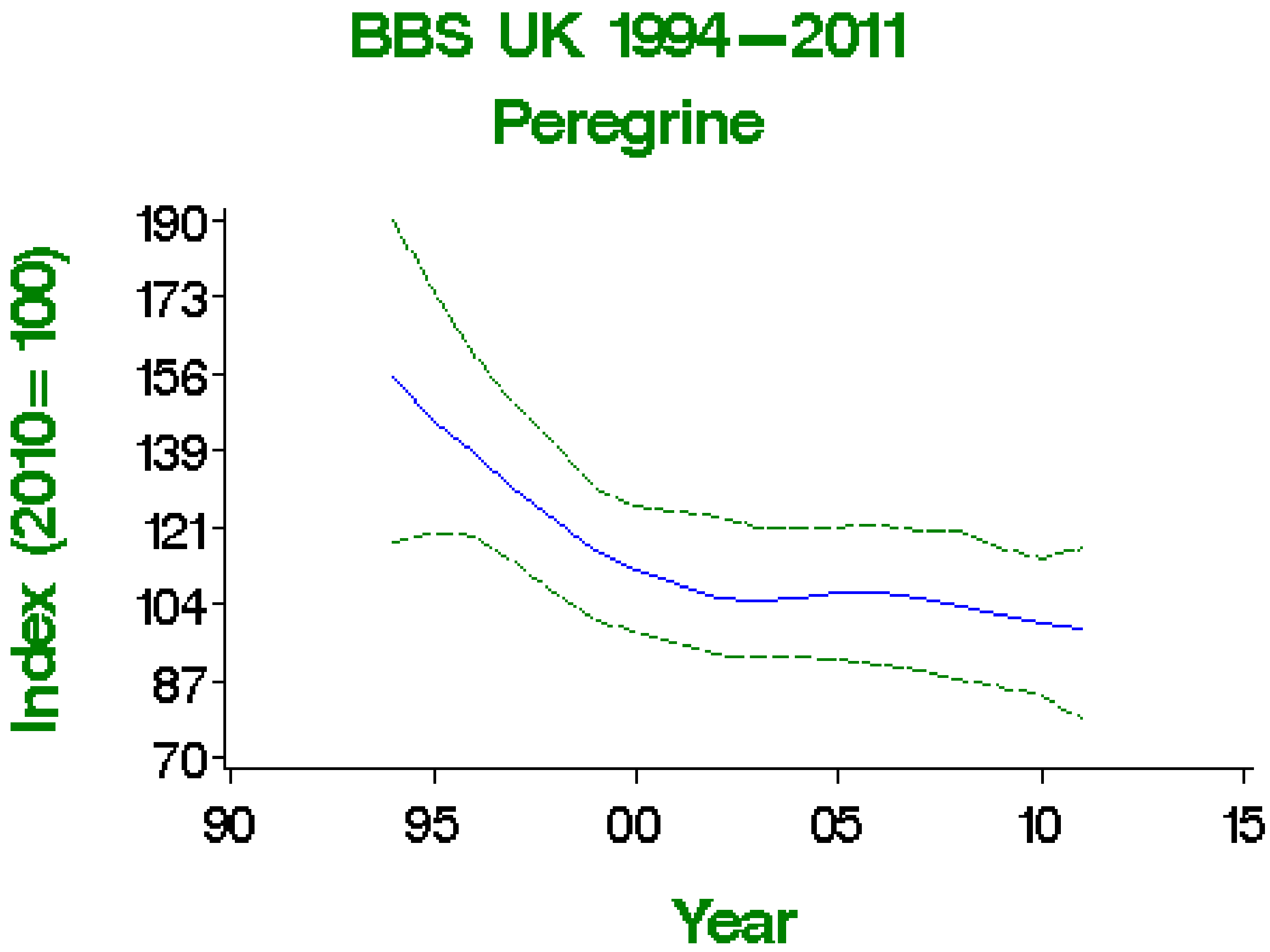
Falco peregrinus

Key facts

Conservation listings:	Europe: no SPEC category (favourable conservation status in Europe, not concentrated in Europe) (BiE04) UK: green (species level); amber (race *peregrinus*, >20% of European breeders, European status) (BoCC3); an RBBP species
Long-term trend:	UK, England: increase Northern Ireland, northwest Scotland, North Wales: decline since 1991
Population size:	1,500 pairs in 2002 (APEP13: Banks et al. 2010)

Status summary

The UK population size, distribution and breeding performance have all largely recovered from the detrimental effects of organochlorine pesticides in the 1950s and 1960s. Populations and breeding performance have declined recently, however, in northwest Scotland and the Northern Isles (Crick & Ratcliffe 1995). Nest record information for the UK as a whole shows a significant decline in clutch size, although samples for the first ten years are small. No trends are yet evident in the number of fledglings per breeding attempt. In northern England, breeding productivity on grouse moors has been 50% lower than at nests in other habitats, indicating that illegal persecution on land managed for grouse shooting is still an important pressure on the population (Amar et al. 2011). The number of UK breeding pairs has been censused every ten years since 1961 by BTO/JNCC/RSPB/Raptor Study Groups, and has been estimated as follows: 1961 - 385 pairs; 1971 - 489 pairs; 1981 - 728 pairs; 1991 - 1,283 pairs (Ratcliffe 1993). The Banks et al. 2003, 2010); around 50 pairs were missed in Wales, however (Dixon et al. 2008). Similar increases across Europe have resulted in a downgrading of conservation listing from 'SPEC 3 (rare)' to 'secure' (BirdLife International 2004), and consequently the species has recently been moved from the amber to the green list in the UK.



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

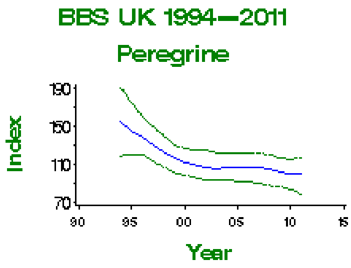
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	15	1995-2010	41	-31	-53	-6	>25	

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	10	2000-2010	47	-11	-33	15		
	5	2005-2010	56	-7	-25	14		

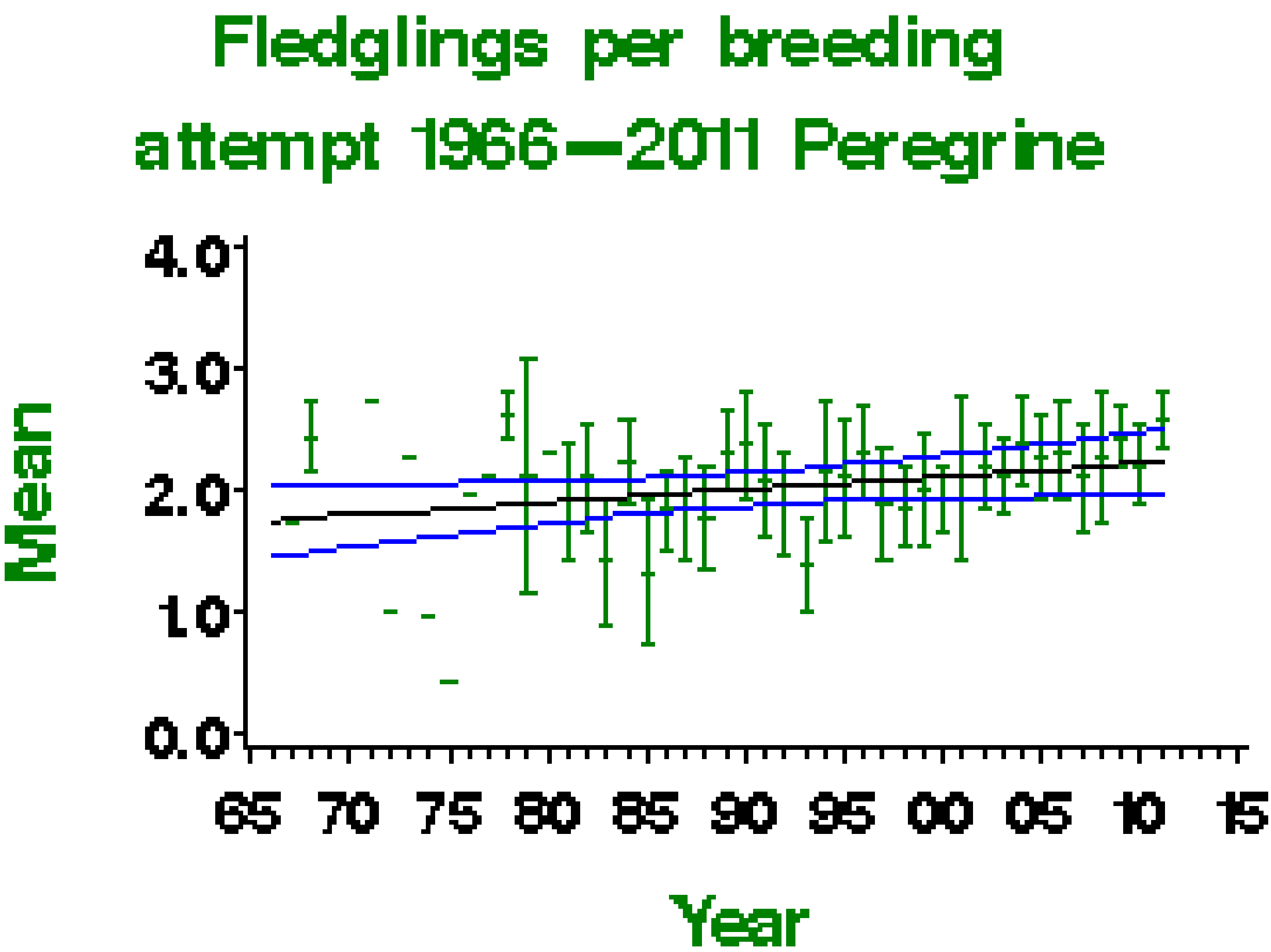
Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB

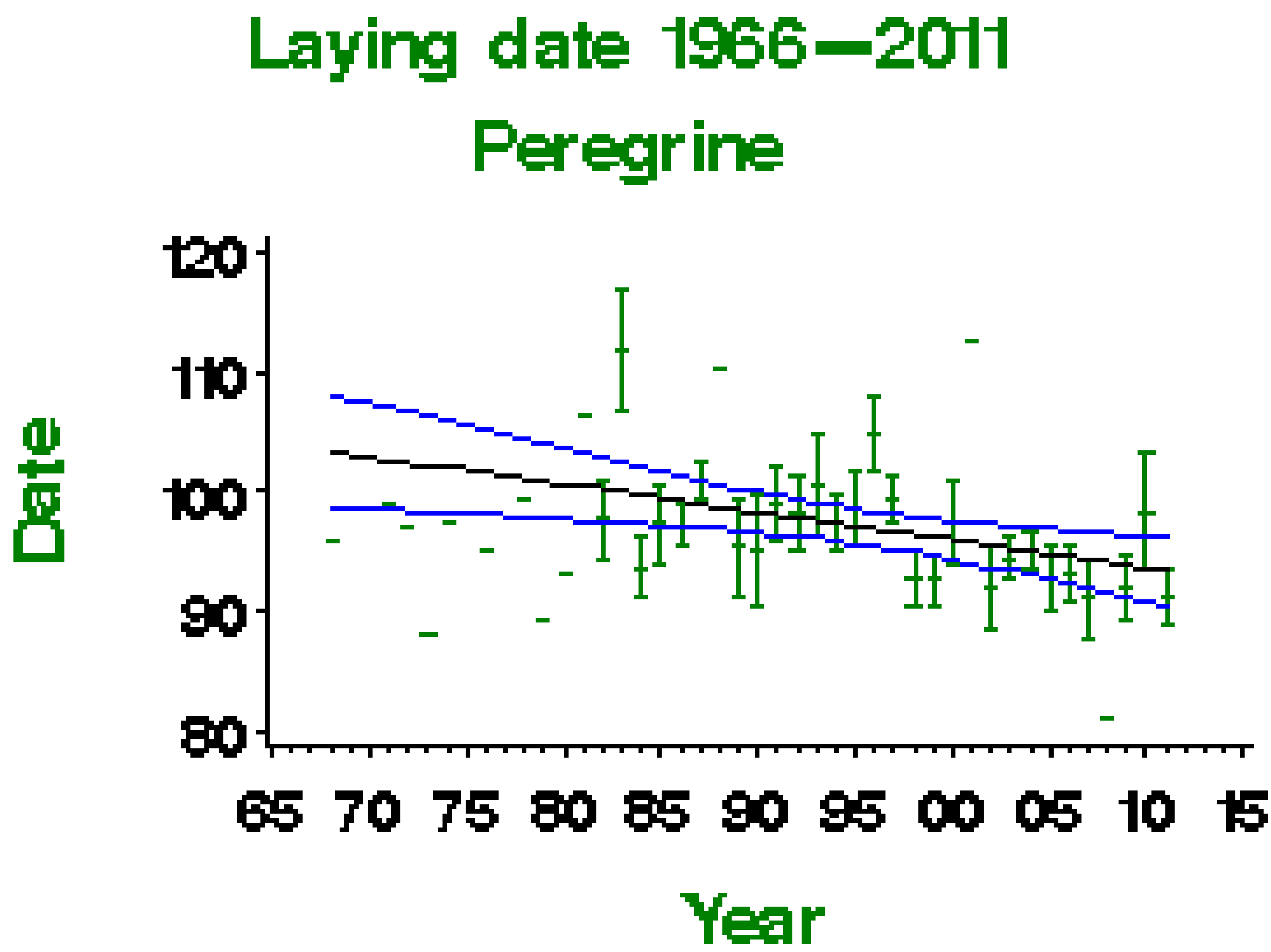


BBS UK graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend



Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	21	None					
Clutch size	42	1968-2010	18	Linear decline	3.52 eggs	3.12 eggs	-11.2%		Small sample
Brood size	42	1968-2010	45	Linear increase	2.37 chicks	2.59 chicks	9.6%		
Nest failure rate at egg stage	42	1968-2010	23	Curvilinear	0.18% nests/day	0.18% nests/day			Small sample
Nest failure rate at chick stage	42	1968-2010	25	None					Small sample
Laying date	42	1968-2010	10	Linear decline	Apr 13	Apr 4	-9 days		Small sample

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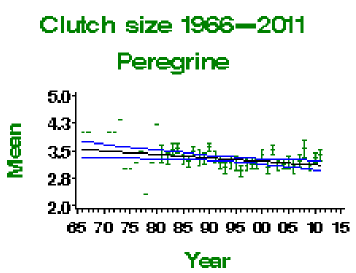
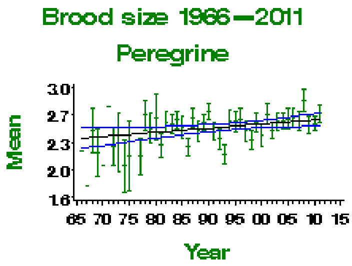
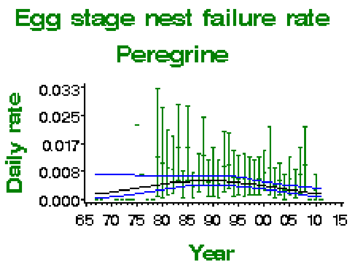


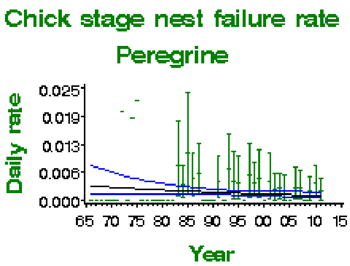
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



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Moorhen

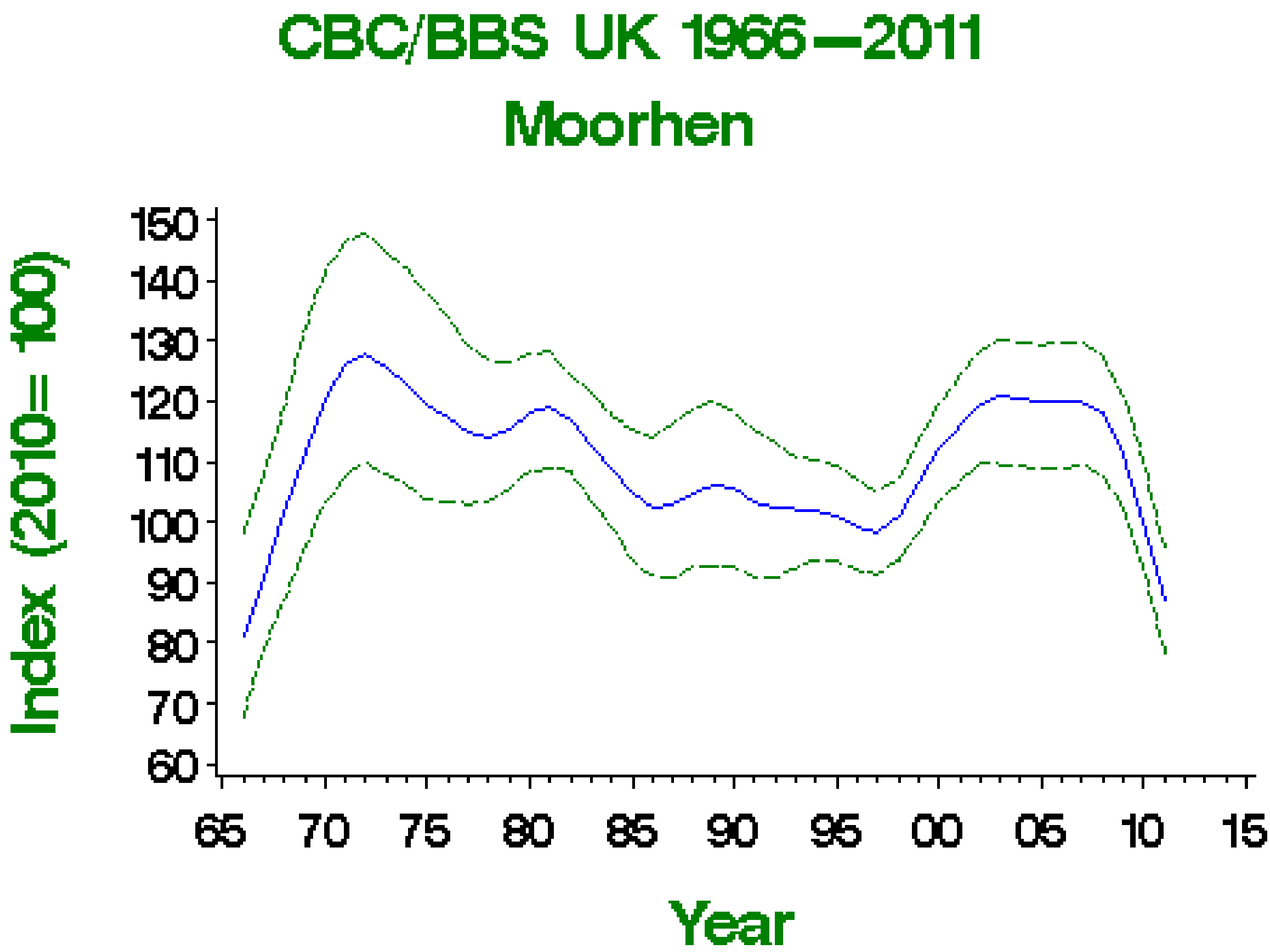
Gallinula chloropus

Key facts

Conservation listings:	Europe: no SPEC category (favourable conservation status in Europe, not concentrated in Europe) (BiE04) UK: green (BoCC3)
Long-term trend:	UK: probable shallow increase
Population size:	270,000 territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Status summary

While the long-term CBC/BBS trend is of shallow increase, much of the population increase took place before 1974, when WBS monitoring began, and may have been a recovery from heavy mortality during the cold winters of the early 1960s. On both CBC/BBS and WBS/WBBS evidence, there was decrease during the 1970s and 1980s, but this has been followed by a partial recovery. The BBS Leech & Barimore 2008), but average brood sizes have increased and no trend has been evident in the number of fledglings per breeding attempt. There has been little long-term change across Europe since 1980 (PECBMS 2012a).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	313	10	-18	42		
	25	1985-2010	462	-4	-16	13		
	10	2000-2010	728	-11	-16	-4		
	5	2005-2010	808	-17	-20	-10		
CBC/BBS England	43	1967-2010	288	18	-12	50		

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	25	1985-2010	427	-3	-15	13		
	10	2000-2010	676	-10	-15	-3		
	5	2005-2010	754	-14	-17	-7		
WBS/WBBS waterways	35	1975-2010	122	-26	-42	-7	>25	
	25	1985-2010	143	-2	-23	23		
	10	2000-2010	203	-16	-23	-7		
	5	2005-2010	198	-17	-23	-10		
BBS UK	15	1995-2010	650	1	-5	11		
	10	2000-2010	718	-11	-15	-3		
	5	2005-2010	801	-17	-20	-12		
BBS England	15	1995-2010	601	1	-8	11		
	10	2000-2010	667	-9	-13	-2		
	5	2005-2010	749	-15	-18	-8		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

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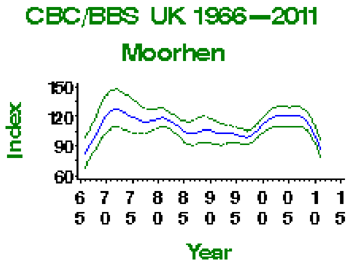
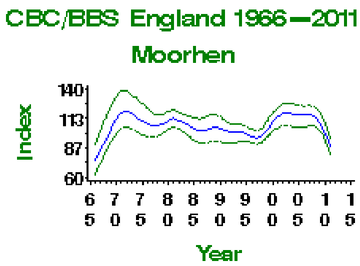
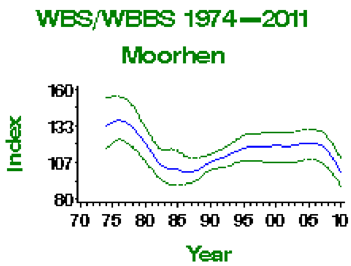


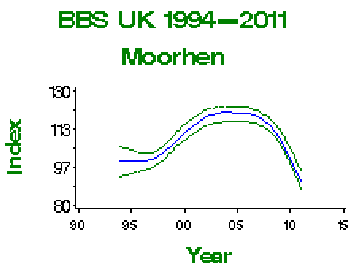
CBC/BBS UK graph



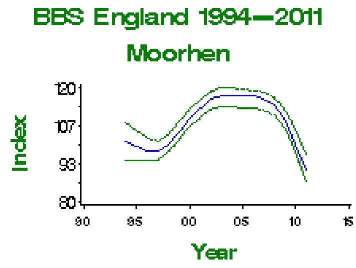
CBC/BBS England graph



WBS/WBBS waterways graph

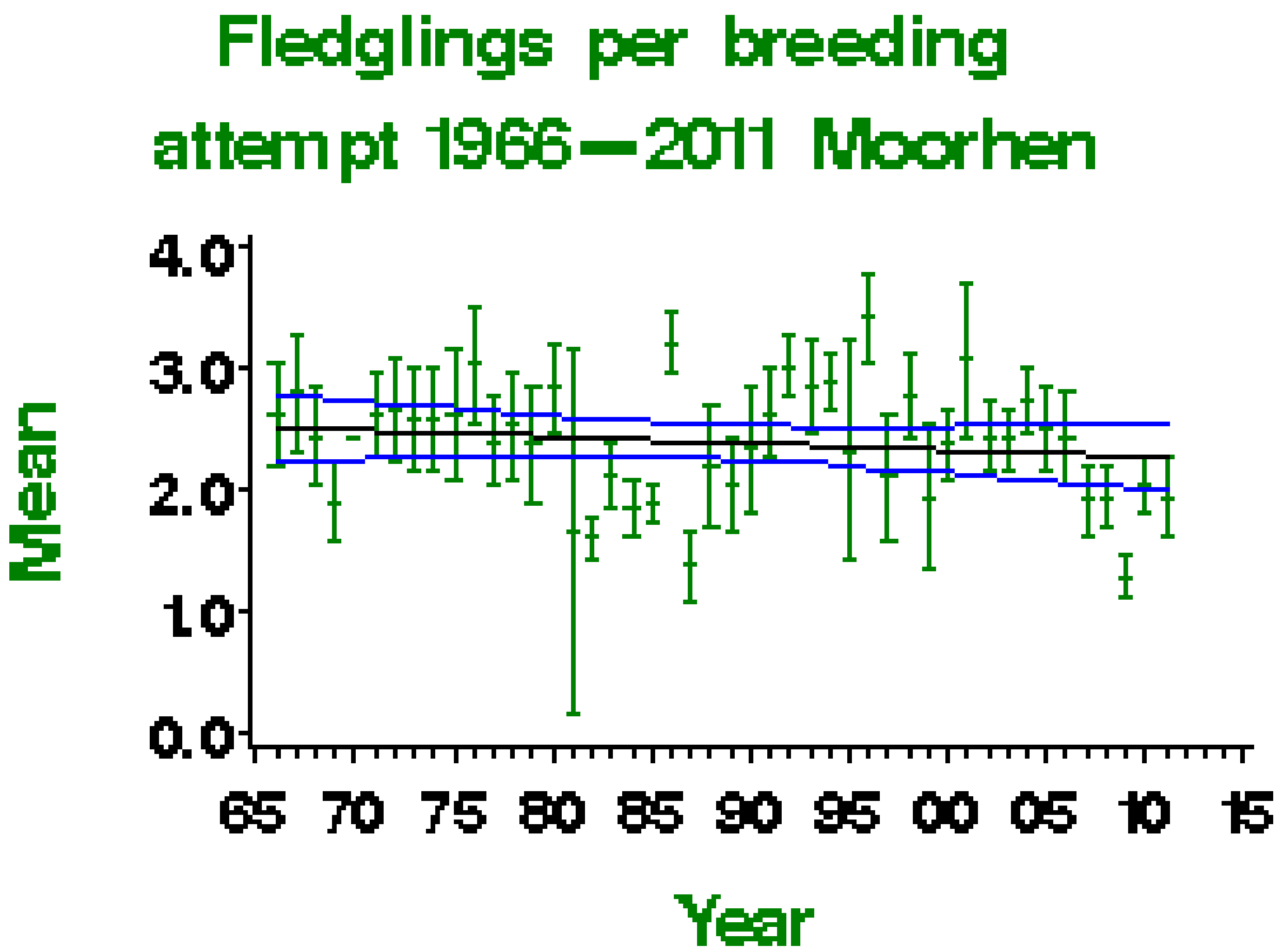


BBS UK graph

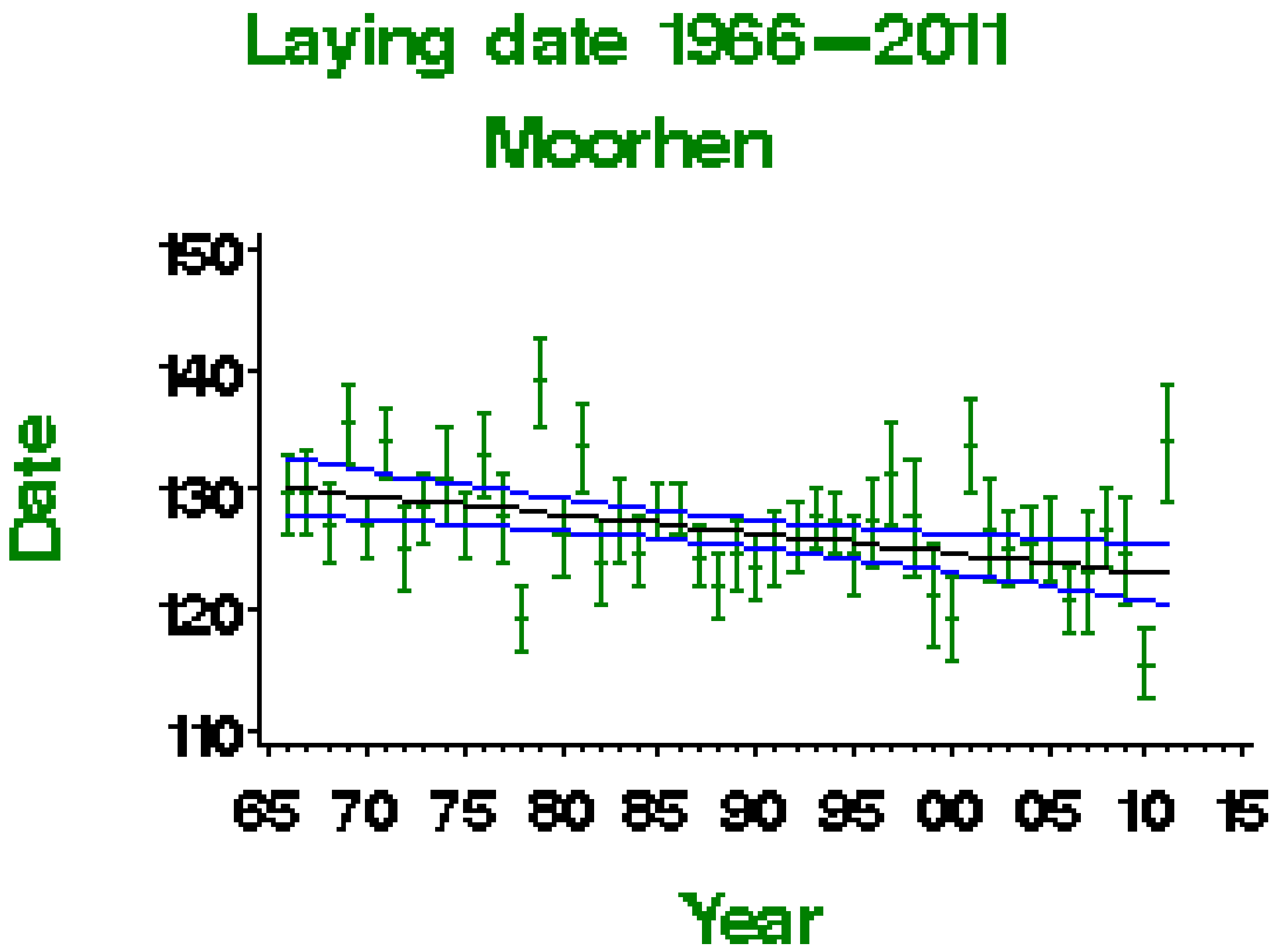


BBS England graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

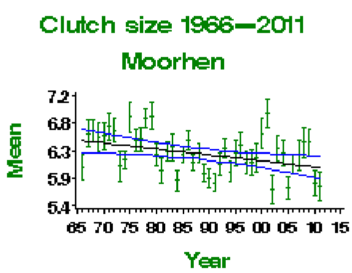


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

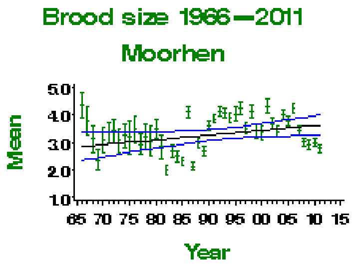
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	40	None					
Clutch size	42	1968-2010	97	Linear decline	6.44 eggs	6.04 eggs	-6.3%		
Brood size	42	1968-2010	84	None					
Nest failure rate at egg stage	42	1968-2010	113	Curvilinear	1.28% nests/day	2.37% nests/day	85.2%		
Nest failure rate at chick stage	42	1968-2010	40	None					
Laying date	42	1968-2010	70	Linear decline	May 10	May 3	-7 days		

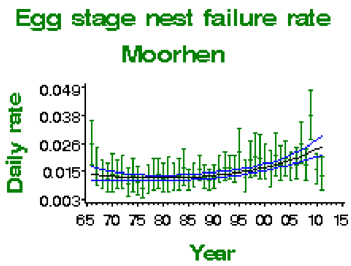
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



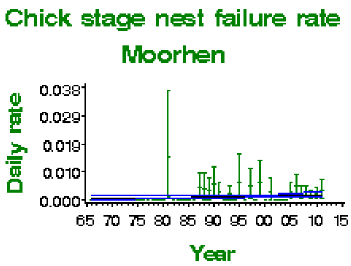
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Coot

Fulica atra

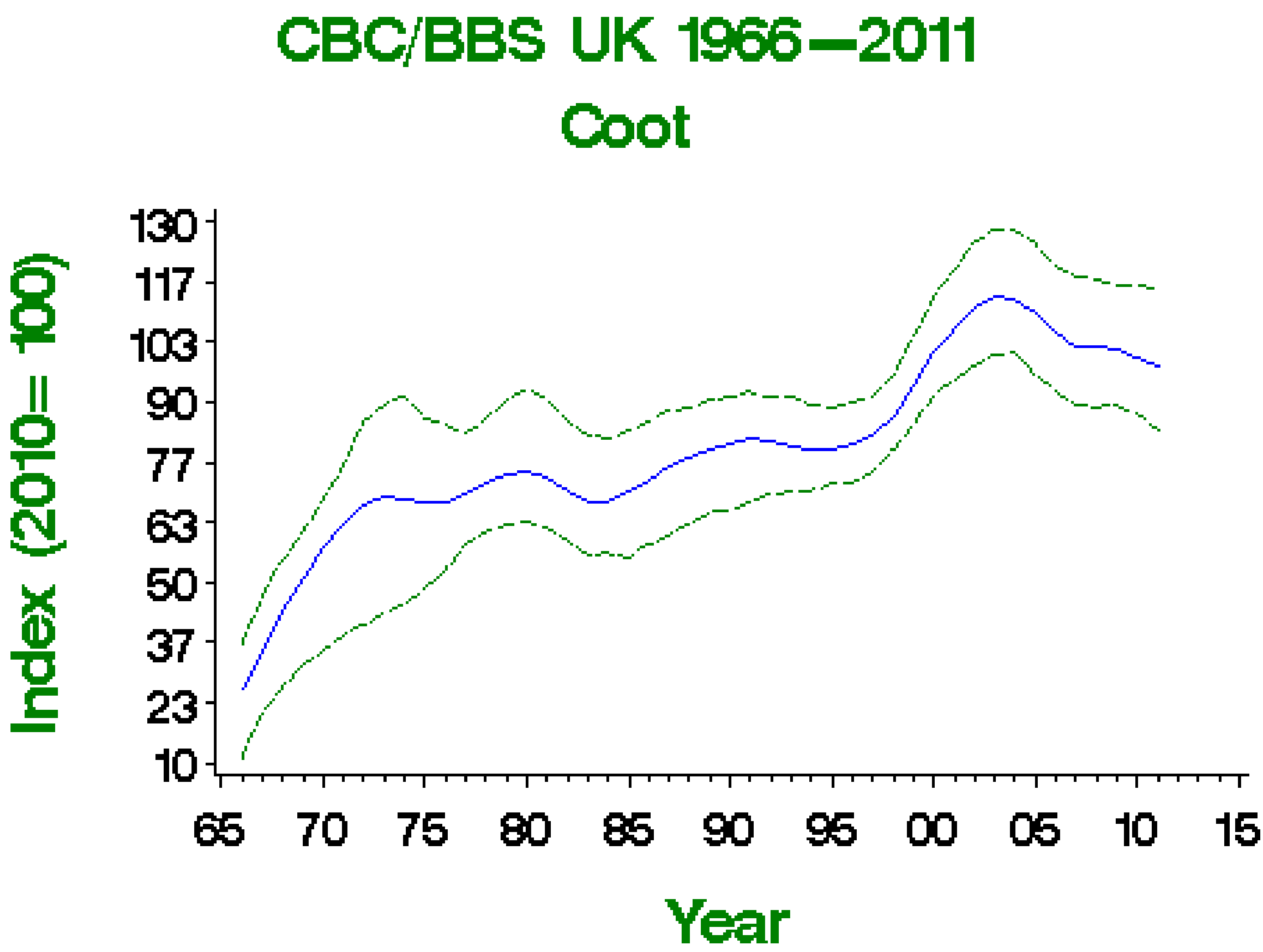
Key facts

Conservation listings:	Europe: no SPEC category (favourable conservation status in Europe, not concentrated in Europe) (BiE04) UK: green (BoCC3)
Long-term trend:	UK: rapid increase
Population size:	31,000 pairs in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Migrant status:	Resident
Nesting habitat:	Ground nester
Primary breeding habitat:	Wetland
Secondary breeding habitat:	
Breeding diet:	Vegetation
Winter diet:	Vegetation

Status summary

WBS/WBBS and CBC/BBS trends for Coot indicate a long-term increase, although the magnitude of the change is not clear. Small CBC samples, mainly of birds on small water-bodies, suggested a rapid rise in the late 1960s. WBS/WBBS and BBS include more birds on larger waters, and so may be more representative of Coot populations, but WBS/WBBS has not recorded the strong increase found by BBS observers since 1994. The combination of CBC and BBS data suggests that the long-term increase in the UK and England may have been rapid. There has been widespread moderate increase across Europe since 1980, though with little change since 1990 (PECBMS 2012a). Winter abundance on large still waters, as monitored by WeBS, showed shallow increase from the mid 1980s to around 2000/01 but has since declined, especially in Northern Ireland (Holt et al. 2012a).



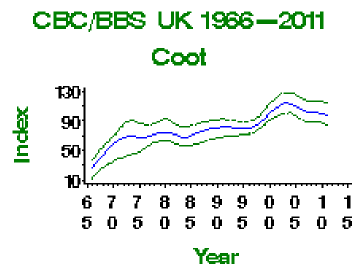
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

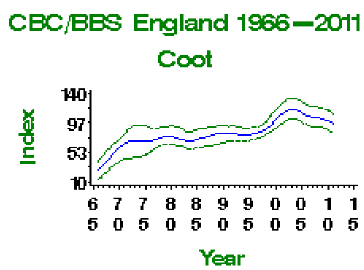
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	119	188	87	559		
	25	1985-2010	184	43	10	106		
	10	2000-2010	305	-1	-12	12		
	5	2005-2010	340	-9	-18	3		
CBC/BBS England	43	1967-2010	108	181	72	482		
	25	1985-2010	167	40	5	85		
	10	2000-2010	276	-1	-14	10		
	5	2005-2010	310	-11	-19	-2		
WBS/WBBS waterways	35	1975-2010	60	83	20	228		
	25	1985-2010	73	36	-6	110		
	10	2000-2010	101	-2	-25	22		
	5	2005-2010	99	-6	-23	9		
BBS UK	15	1995-2010	264	32	14	58		
	10	2000-2010	300	-1	-12	10		
	5	2005-2010	337	-8	-18	4		
BBS England	15	1995-2010	240	30	12	55		
	10	2000-2010	273	-2	-13	10		
	5	2005-2010	308	-12	-21	-1		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

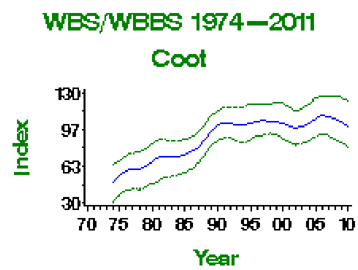
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



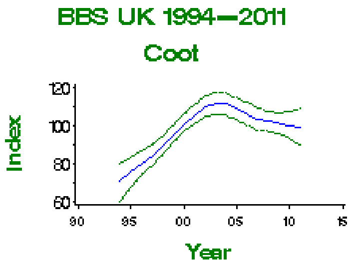
CBC/BBS UK graph



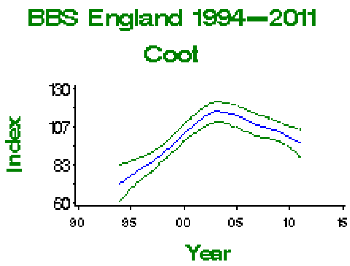
CBC/BBS England graph



WBS/WBBS waterways graph



BBS UK graph



BBS England graph

Demographic trends

Productivity and survival trends for this species are not currently produced by BTO

Causes of change

There are no demographic trends available for this species and very little evidence regarding the ecological drivers of change.

Change factor	Primary driver	Secondary driver
Demographic	Unknown	
Ecological	Unknown	

Further information on causes of change

There is very little information available regarding the demographic or ecological drivers of population change in Coot.

Brinkhof & Cave (1997) conducted a supplementary feeding experiment and found that seasonal variation in offspring production was in essence the result of seasonal variation in food availability. Thus, increases in food supply may have improved breeding success, but there is no evidence to support this.

Work from Finland (Ronka et al. 2005) has suggested that Coot are sensitive to overwinter weather: thus it is possible that this species may have benefited from milder winters.

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Oystercatcher

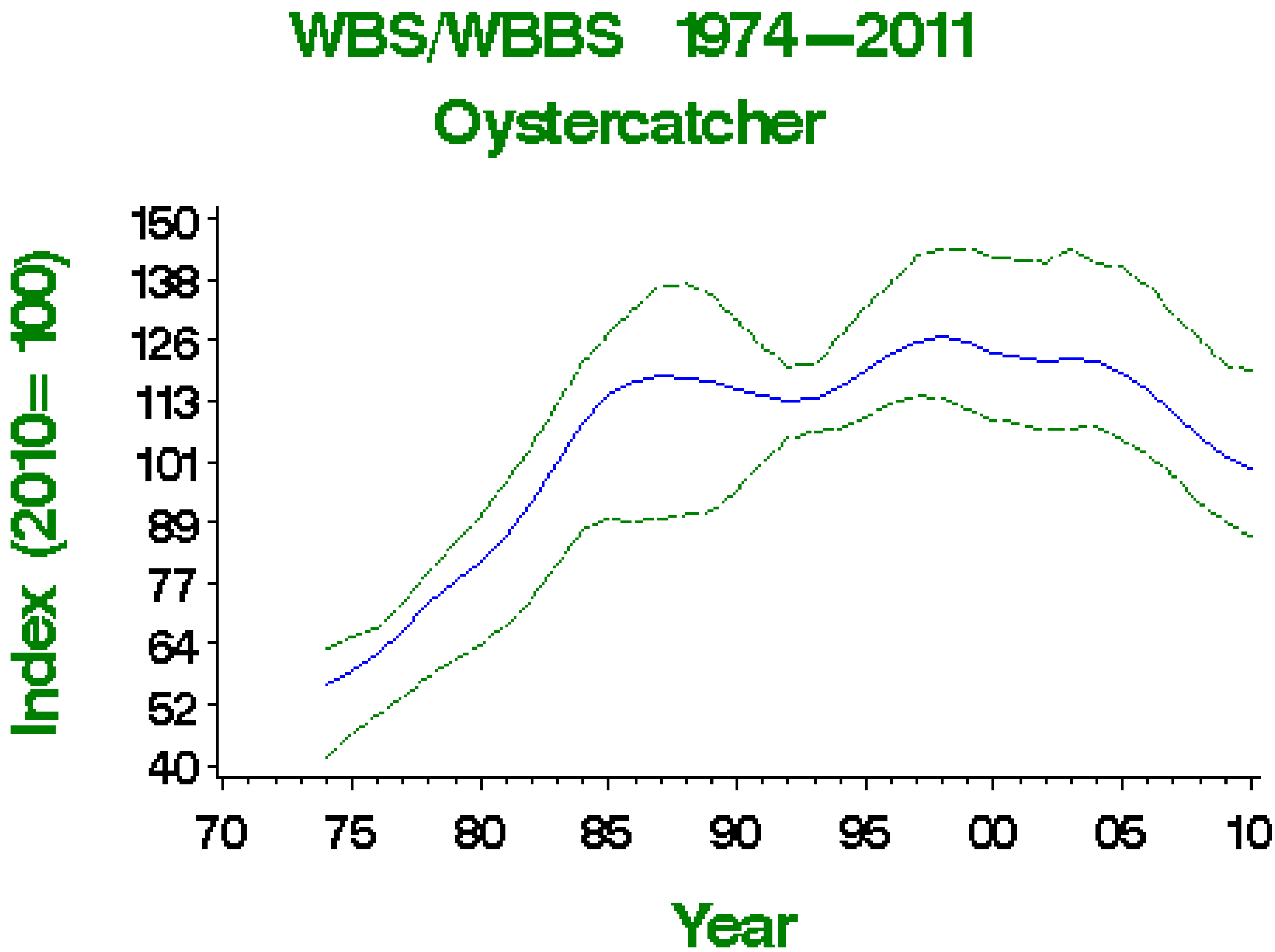
Haematopus ostralegus

Key facts

Conservation listings:	Europe: no SPEC category (concentrated in Europe, conservation status favourable) (BiE04) UK: amber (>20% of European breeding population, >20% of East Atlantic Flyway population in winter, localised wintering population) (BoCC3)
Long-term trend:	UK waterways: moderate increase
Population size:	110,000 pairs in 2009 (APEP13: 1985-99 estimate (O'Brien 2004) updated using CBC/BBS trend)

Status summary

Oystercatchers increased along linear waterways between 1974 and about 1986, as the species colonised inland sites across England and Wales (Gibbons et al. 1993). Thereafter, the WBS/WBBS index stabilised and now appears to be in decline, so showing a pattern similar to that in winter abundance revealed by WeBS (Holt et al. 2012a). Surveys in England and Wales revealed an increase of 47% in breeding birds in wet meadows between 1982 and 2002 (Wilson et al. 2005). BBS data since 1994, which include birds in a broader range of locations and habitats, show strong increase in England but a significant decline in Scotland. The increase in nest failure rates during the 27-day egg stage (25 days for incubation and 2 days for laying) probably results from the spread of the species into less favourable habitats, where nest losses through predation or trampling may be more likely. The trend towards earlier laying can be partly explained by recent climate change (Crick & Sparks 1999).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

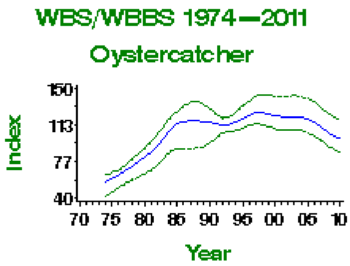
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
WBS/WBBS waterways	35	1975-2010	46	70	32	175		
	25	1985-2010	57	-13	-35	38		
	10	2000-2010	95	-19	-30	-2		
	5	2005-2010	97	-16	-25	-5		

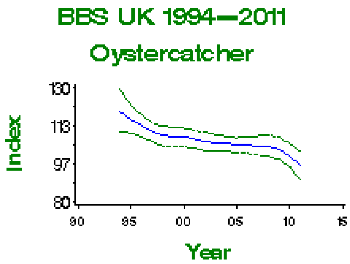
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	15	1995-2010	323	-14	-22	-4		
	10	2000-2010	363	-7	-15	2		
	5	2005-2010	425	-5	-12	3		
BBS England	15	1995-2010	174	48	26	72		
	10	2000-2010	206	29	14	42		
	5	2005-2010	248	7	-2	15		
BBS Scotland	15	1995-2010	127	-29	-37	-18	>25	
	10	2000-2010	128	-19	-28	-8		
	5	2005-2010	139	-10	-18	1		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

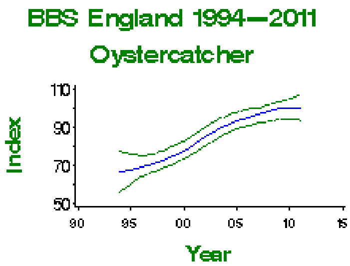
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



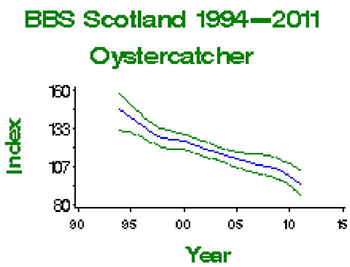
WBS/WBBS waterways graph



BBS UK graph



BBS England graph

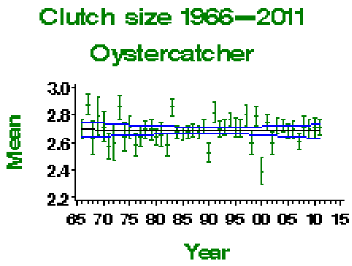


BBS Scotland graph

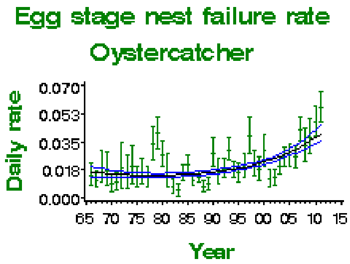
Demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Clutch size	42	1968-2010	112	None					
Nest failure rate at egg stage	42	1968-2010	118	Curvilinear	1.54% nests/day	3.77% nests/day	144.8%		
Laying date	42	1968-2010	49	Linear decline	May 16	May 9	-7 days		

For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

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Golden Plover

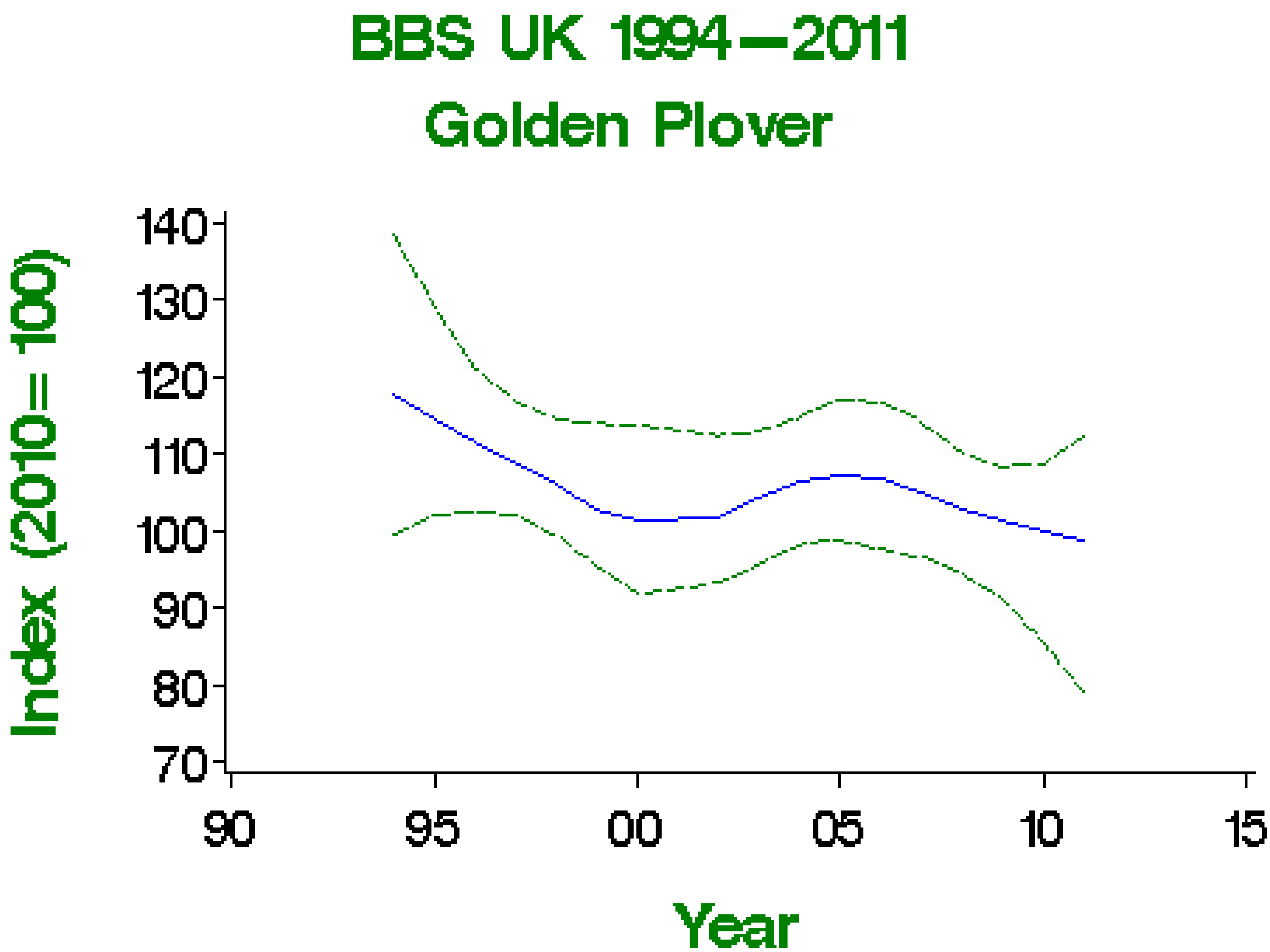
Pluvialis apricaria

Key facts

Conservation listings:	Europe: no SPEC category (concentrated in Europe, conservation status favourable) (BiE04) UK: amber (BoCC3)
Long-term trend:	UK: probable decline
Population size:	38,400-59,400 pairs in 1980-2000 (APEP13: BiE04)

Status summary

There was no annual monitoring of the breeding population before the inception of BBS. Since 1994, BBS has shown stability or minor decrease in the UK and Scotland, but this is believed to follow an earlier decline (Gibbons et al. 1993). A detailed survey has confirmed that a sharp decline has occurred in Wales since the 1980s, with just 36 pairs located in 2007 (Johnstone et al. 2008). Nest survival on grass moors, unlike that on heather moors, may have declined over time (Crick 1992), perhaps linked to increased stocking densities of sheep (Fuller 1996). There is no clear trend in clutch size; a large number of late-season nest records, which provide higher proportions of two- and three-egg clutches, were submitted from an intensive study during 1996-98 (J.W. Pearce-Higgins, pers. comm.). Warmer springs are reported to advance the breeding phenology of Golden Plovers and of their tipulid prey (Pearce-Higgins et al. 2005). There has been no long-term change across Europe since 1981 (PECBMS 2012a). Winter numbers counted by WeBS, although mainly at coastal sites and omitting some big concentrations inland, increased strongly in Britain between the mid 1980s and 2006, since when there has been a sharp fall (Holt et al. 2012a); these birds are mainly of Fennoscandian or Russian origin. The species has recently been restored to the amber list because of the international importance of the UK's wintering population.



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	15	1995-2010	63	-13	-32	4		
	10	2000-2010	64	-1	-21	13		

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	5	2005-2010	78	-7	-26	8		
BBS Scotland	15	1995-2010	39	-21	-44	1		
	10	2000-2010	33	-6	-29	10		
	5	2005-2010	35	-16	-38	4		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

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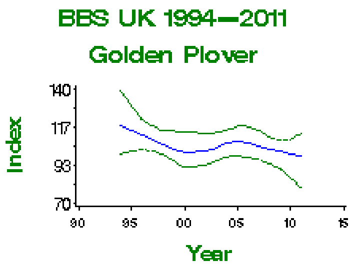
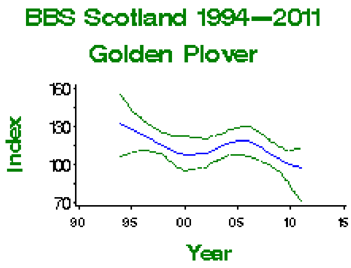


BBS UK graph

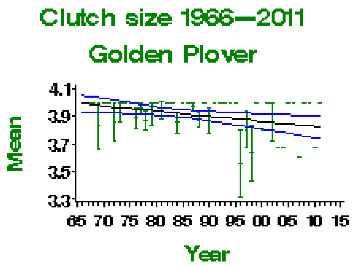


BBS Scotland graph

Demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Clutch size	42	1968-2010	12	Linear decline	3.99 eggs	3.83 eggs	-3.9%		Small sample

For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend

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Lapwing

Vanellus vanellus

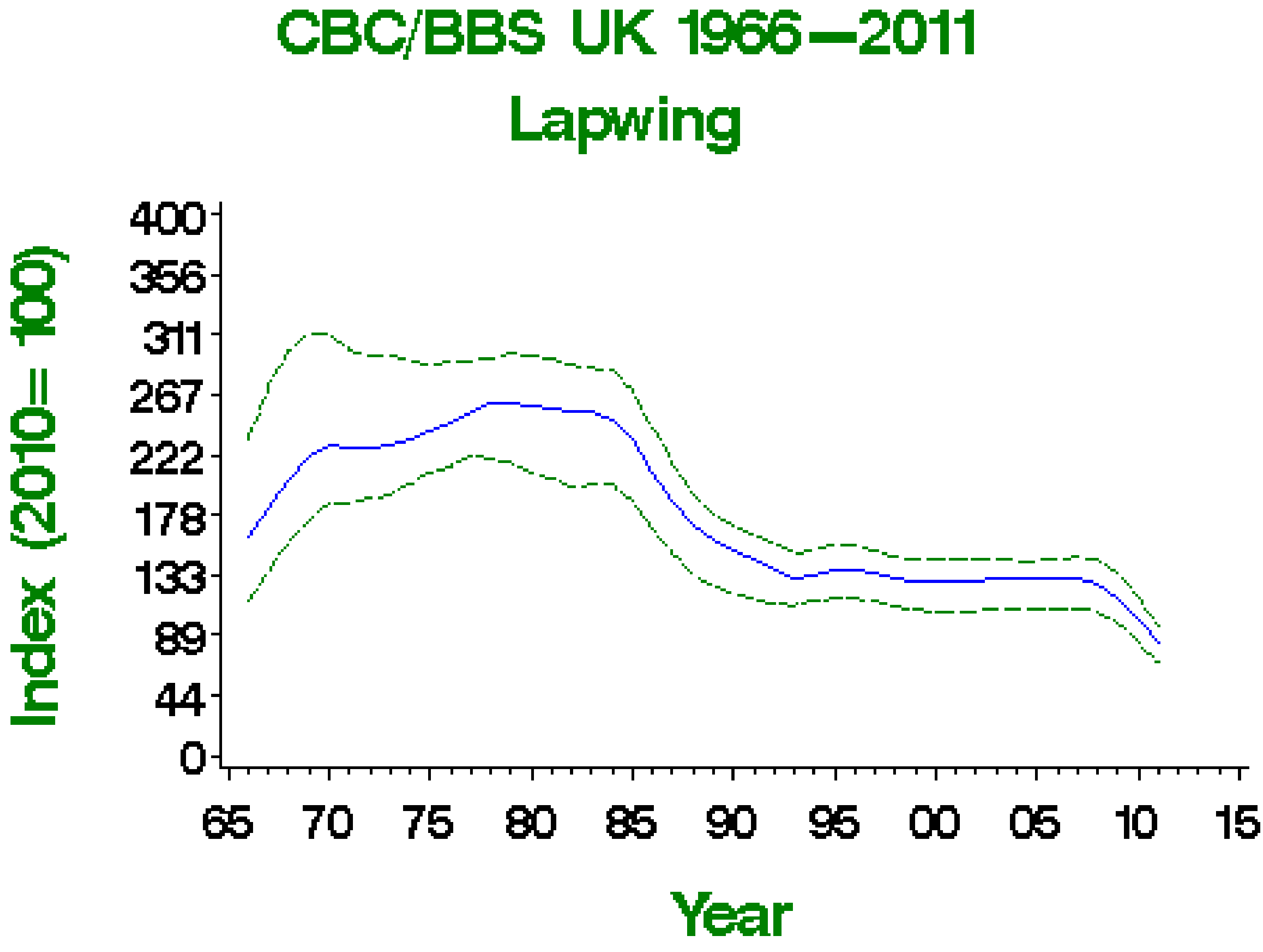
Key facts

Conservation listings:	Europe: SPEC category 2 (vulnerable) (BiE04) UK: red (BoCC3) UK Biodiversity Action Plan: priority species
Long-term trend:	UK: shallow decline
Population size:	140,000 pairs in 2009 (APEP13: 1985-99 estimate (O'Brien 2004) updated using CBC/BBS trend)

Migrant status:	Short-distance migrant
Nesting habitat:	Ground nester
Primary breeding habitat:	Wetland
Secondary breeding habitat:	Farmland
Breeding diet:	Animal
Winter diet:	Animal

Status summary

Although CBC recorded some increase in its early years, Lapwings have declined continuously on lowland farmland since the mid 1980s. National surveys in England and Wales showed a 49% population decline between 1987 and 1998 (Wilson et al. 2001). Population declines of more than 50% over 15 years in Northern Ireland (Henderson et al. 2002) mirror similar declines throughout grassland areas of Wales and southeast England (Wilson et al. 2001, 2005). The BBS Holt et al. 2012a); these birds are mainly of continental origin. Lapwing is one of the most strongly declining bird species in Europe, having decreased in all regions since 1980, although with differing regional timing (PECBMS 2009, 2012a). The 2009 review moved this species from amber to the UK red list, for which it qualifies on the strength of its UK decline.



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	292	-45	-68	-18	>25	
	25	1985-2010	457	-57	-66	-45	>50	
	10	2000-2010	759	-22	-30	-13		
	5	2005-2010	857	-23	-26	-16		
CBC/BBS England	43	1967-2010	244	-28	-66	14		
	25	1985-2010	381	-49	-61	-34	>25	
	10	2000-2010	643	-14	-21	-4		
	5	2005-2010	733	-23	-26	-18		
WBS/WBBS waterways	30	1980-2010	68	-39	-63	14		
	25	1985-2010	74	-62	-75	-39	>50	
	10	2000-2010	111	-37	-49	-25	>25	
	5	2005-2010	110	-26	-36	-19	>25	
BBS UK	15	1995-2010	665	-32	-38	-23	>25	
	10	2000-2010	724	-22	-29	-13		
	5	2005-2010	802	-23	-26	-16		
BBS England	15	1995-2010	554	-14	-23	-5		
	10	2000-2010	612	-14	-23	-6		
	5	2005-2010	684	-22	-26	-16		
BBS Scotland	15	1995-2010	88	-48	-60	-35	>25	
	10	2000-2010	88	-31	-47	-12	>25	
	5	2005-2010	94	-22	-30	-9		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

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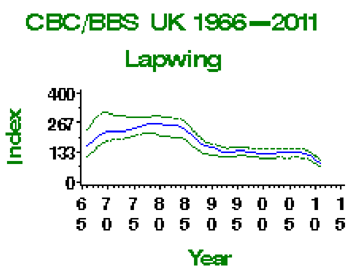
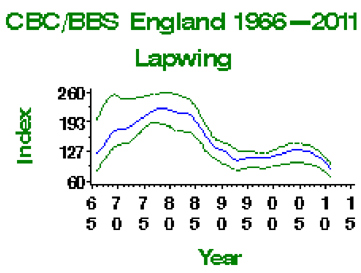
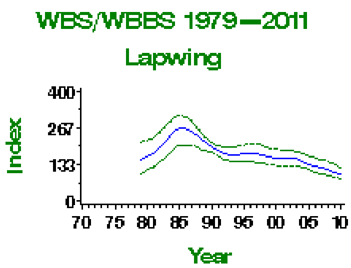


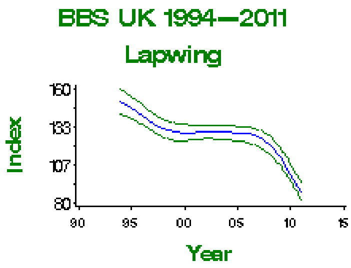
CBC/BBS UK graph



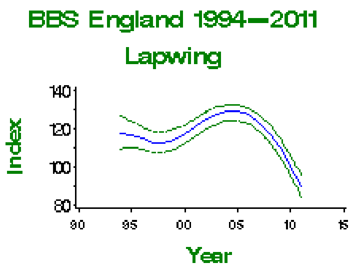
CBC/BBS England graph



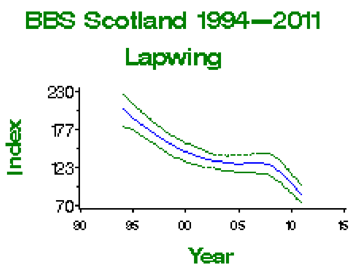
WBS/WBBS waterways graph



BBS UK graph



BBS England graph

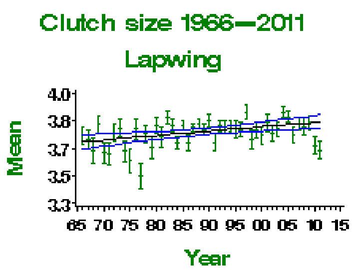


BBS Scotland graph

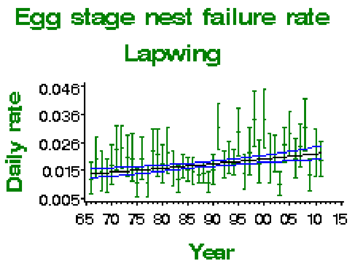
Demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Clutch size	42	1968-2010	127	Linear increase	3.70 eggs	3.81 eggs	3.2%		
Nest failure rate at egg stage	42	1968-2010	133	Linear increase	1.43% nests/day	2.14% nests/day	49.7%		
Laying date	42	1968-2010	29	None			0 days		Small sample

For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

Causes of change

There is good evidence that declines have resulted from habitat loss and degradation due to changes in agricultural practice, in particular change from spring to autumn sowing, drainage of grasslands and loss of mixed farmland, which have led to breeding productivity dropping below a sustainable level. Chick mortality is thought to be the main determinant of poor Lapwing productivity, and therefore of population decline.

Change factor	Primary driver	Secondary driver
Demographic	Decreased breeding success	
Ecological	Agricultural intensification	

Further information on causes of change

Although there has been a slight increase in clutch size for this species, daily failure rates at the egg stage have increased dramatically (see above). Adult and first-year survival rates show no trend through time (Peach et al. 1994, Catchpole et al. 1999) and are unlikely to be the main driver of population declines (Sharpe et al. 2008). Chick mortality is thought to be the main determinant of poor Lapwing productivity and therefore of population decline (Sharpe et al. 2008), although evidence to support this is largely circumstantial and further empirical research is needed.

There is a good deal of research supporting the hypothesis that habitat loss and degradation due to the intensification of farming are likely to have been the main driver in the decline of this species, by reducing breeding productivity (e.g. Galbraith 1988, Shrubb 1990, Hotker 1991, Hudson et al. 1994, Siriwardena et al. 2000a, Taylor & Grant 2004, Wilson et al. 2005, Milsom 2005, Fuller & Ausden 2008). These changes include extensive drainage, increased use of pesticides and fertilisers, re-seeding, earlier and more frequent mowing, increased grazing pressure and loss of spring cereals. Increases in intensity of grazing have reduced the habitat quality for Lapwing (Shrubb 1990, Fuller & Ausden 2008), whilst fertilisation has led to earlier spring grass growth, earlier cutting dates and higher stocking levels, which have increased egg and chick mortality and reduced relaying opportunities (Durant et al. 2008). Drainage and loss of wet features on grassland have also had a negative impact, reducing food supplies (Taylor & Grant 2004, Eglington et al. 2010).

Loss of mixed farming systems and extensive grazing have reduced the availability of high-quality foraging habitat close to nesting habitat, i.e. unimproved pasture and meadows, to birds breeding in arable areas, resulting in reduced breeding success (Galbraith 1988, Hudson et al. 1994, Henderson et al. 2004).

In the uplands, afforestation has also resulted in habitat loss (Fuller & Ausden 2008). On arable land, spring-sown cereals were once favoured nesting crops but these have been widely replaced by autumn-sown cereals, which are less suitable breeding habitats (Shrubb 1990, Shrubb et al. 1991, Mason & Macdonald 1999, Fuller & Ausden 2008).

Lapwing population declines may be explained partly by increased nest predation rates resulting from habitat changes due to agricultural intensification (Baines 1990, Liker & Szekely 1997, Jackson & Green 2000, Chamberlain & Crick 2003, Evans 2004, Jackson et al. 2004, Milsom 2005, Bolton et al. 2007, Teunissen et al. 2008, MacDonald & Bolton 2008b, Bellebaum & Bock 2009). Long-term nest record card analysis has shown that the proportion of nests lost to predators was substantially higher in the 1990s than in previous decades (Sharpe et al. 2008). Recent empirical evidence suggests that levels of predation on wader nests are unsustainably high in many cases, even in some situations where breeding habitat is otherwise favourable (MacDonald & Bolton 2008a).

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Ringed Plover

Charadrius hiaticula

Key facts

Conservation listings:	Europe: no SPEC category (concentrated in Europe, conservation status favourable) (BiE04) UK: amber (species level and race *hiaticula*, 25-50% decline, >20% East Atlantic Flyway population in winter) (BoCC3)
Long-term trend:	UK: decline
Population size:	5,400 (5,300-5,600) pairs in 2007 (APEP13: Conway et al. 2008)

Status summary

The breeding population is not monitored annually, but a BTO survey in 1984 showed increases throughout the UK since the previous survey in 1973-74 (Prater 1989). The spread of the breeding distribution inland between the two atlas periods, especially in England, was probably associated with the increase in number of gravel pits and reservoirs (Gibbons et al. 1993). The 1984 survey revealed that over 25% of the UK population nested on the Western Isles, especially on the machair, but breeding waders there have subsequently suffered greatly from predation by introduced hedgehogs (Jackson et al. 2004) - a problem that appears increasingly severe (Jackson 2007). Surveys in England and Wales revealed an increase of 12% in breeding birds in wet meadows between 1982 and 2002 (Wilson et al. 2005). The BTO's repeat national survey in 2007 found an overall decrease in UK population of around 37% since 1984, with the greatest decreases in inland areas (Burton & Conway 2008, Conway et al. 2008, Conway & Burton 2009; clickhere). Ringed Plovers that choose beaches for nesting are especially vulnerable to disturbance, however, and already in 1984 were largely confined in some regions to wardened reserves (Prater 1989). Human usage of beach areas severely restricts the availability of this habitat to nesting plovers (Liley & Sutherland 2007). The marked increase in nest failures at the egg stage has earned Ringed Plover a place on the NRS concern list (Leech & Barimore 2008). Wintering numbers have been in decline since the late 1980s (Holt et al. 2012a).

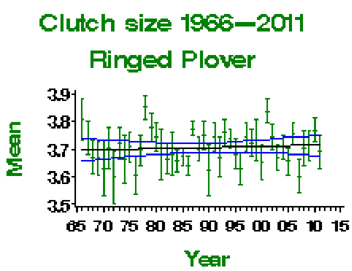
Population changes in detail

Annual breeding population changes for this species are not currently monitored by BTO

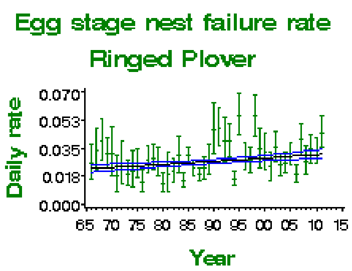
Demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Clutch size	42	1968-2010	92	None					
Nest failure rate at egg stage	42	1968-2010	125	Linear increase	2.27% nests/day	3.12% nests/day	37.4%		
Laying date	42	1968-2010	40	None			0 days		

For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

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Curlew

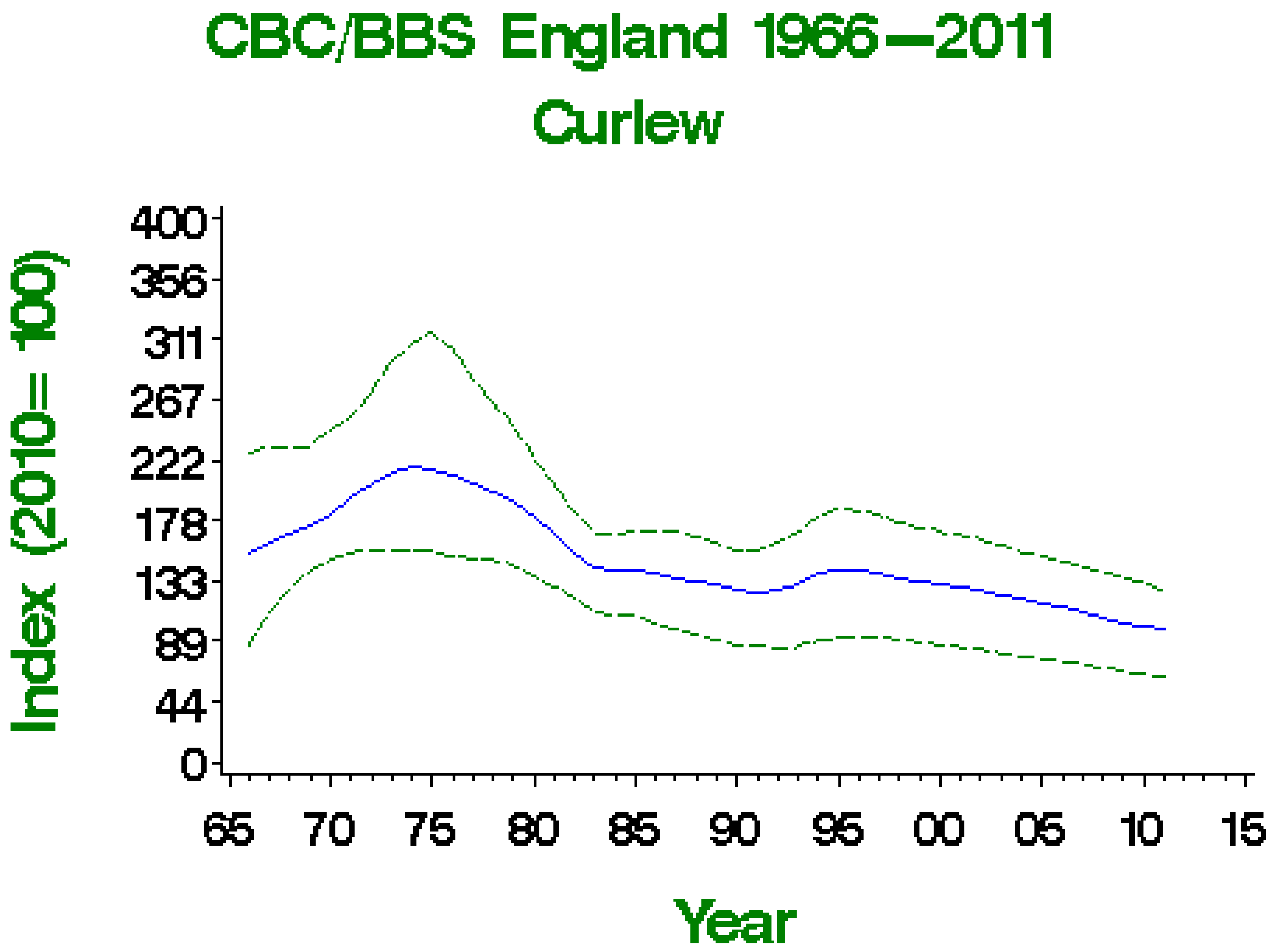
Numenius arquata

Key facts

Conservation listings:	Europe: SPEC category 2 (declining) (BiE04) UK: amber (>20% of European breeding and winter populations) (BoCC3) UK Biodiversity Action Plan: priority species
Long-term trend:	England: moderate decline
Population size:	68,000 pairs in 2009 (APEP13: 1985-99 estimate (O'Brien 2004) updated using CBC/BBS trend)

Status summary

Curlews monitored by CBC were mostly in lowland habitats and may have been affected primarily by drainage of farmland (Gibbons et al. 1993). Surveys of breeding birds in wet meadows in England and Wales revealed a decrease of 39% between 1982 and 2002 (Wilson et al. 2005). A 2006 survey highlighted the rapid decline of the species across all habitats in Wales, with low breeding success as a plausible mechanism (Johnstone et al. 2007). In Northern Ireland, a breeding decline of around 60% occurred between the mid 1980s and 1999 (Henderson et al. 2002). The BBS Holt et al. 2012a).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

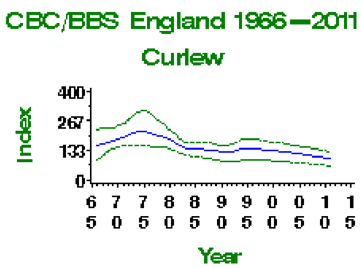
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	43	1967-2010	131	-38	-74	18		Small CBC sample
	25	1985-2010	214	-29	-58	8		Small CBC sample
	10	2000-2010	363	-24	-30	-16		
	5	2005-2010	426	-14	-19	-8		

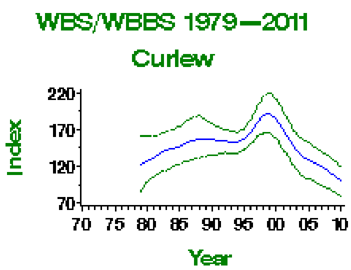
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
WBS/WBBS waterways	30	1980-2010	44	-21	-50	19		
	25	1985-2010	50	-32	-57	-2	>25	
	10	2000-2010	78	-46	-58	-32	>25	
	5	2005-2010	79	-23	-33	-12		
BBS UK	15	1995-2010	511	-44	-50	-38	>25	
	10	2000-2010	543	-34	-40	-27	>25	
	5	2005-2010	609	-16	-22	-9		
BBS England	15	1995-2010	326	-31	-38	-25	>25	
	10	2000-2010	362	-23	-30	-17		
	5	2005-2010	426	-14	-21	-9		
BBS Scotland	15	1995-2010	121	-55	-64	-47	>50	
	10	2000-2010	115	-42	-54	-33	>25	
	5	2005-2010	119	-16	-30	-4		
BBS Wales	15	1995-2010	36	-54	-65	-41	>50	
	10	2000-2010	36	-43	-55	-27	>25	
	5	2005-2010	33	-19	-35	0		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

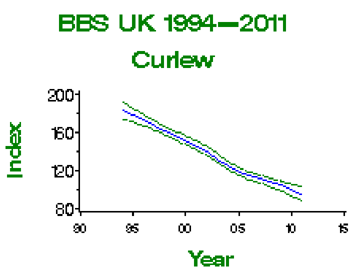
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



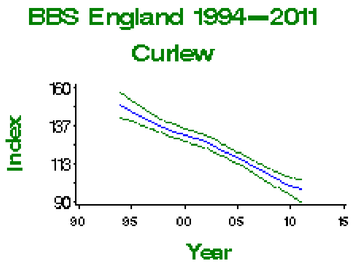
CBC/BBS England graph



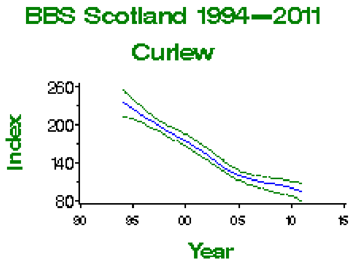
WBS/WBBS waterways graph



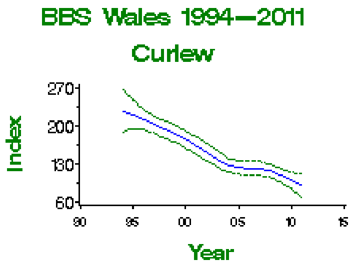
BBS UK graph



BBS England graph



BBS Scotland graph

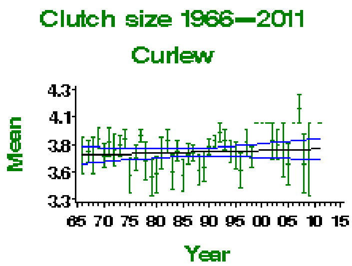


BBS Wales graph

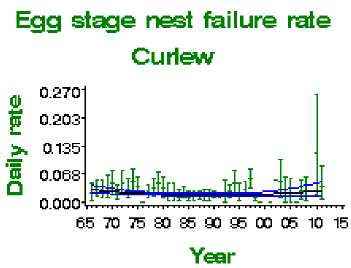
Demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Clutch size	42	1968-2010	20	None					Small sample
Nest failure rate at egg stage	42	1968-2010	22	Curvilinear	2.78% nests/day	2.70% nests/day	-2.9%		Small sample

For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

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Common Sandpiper

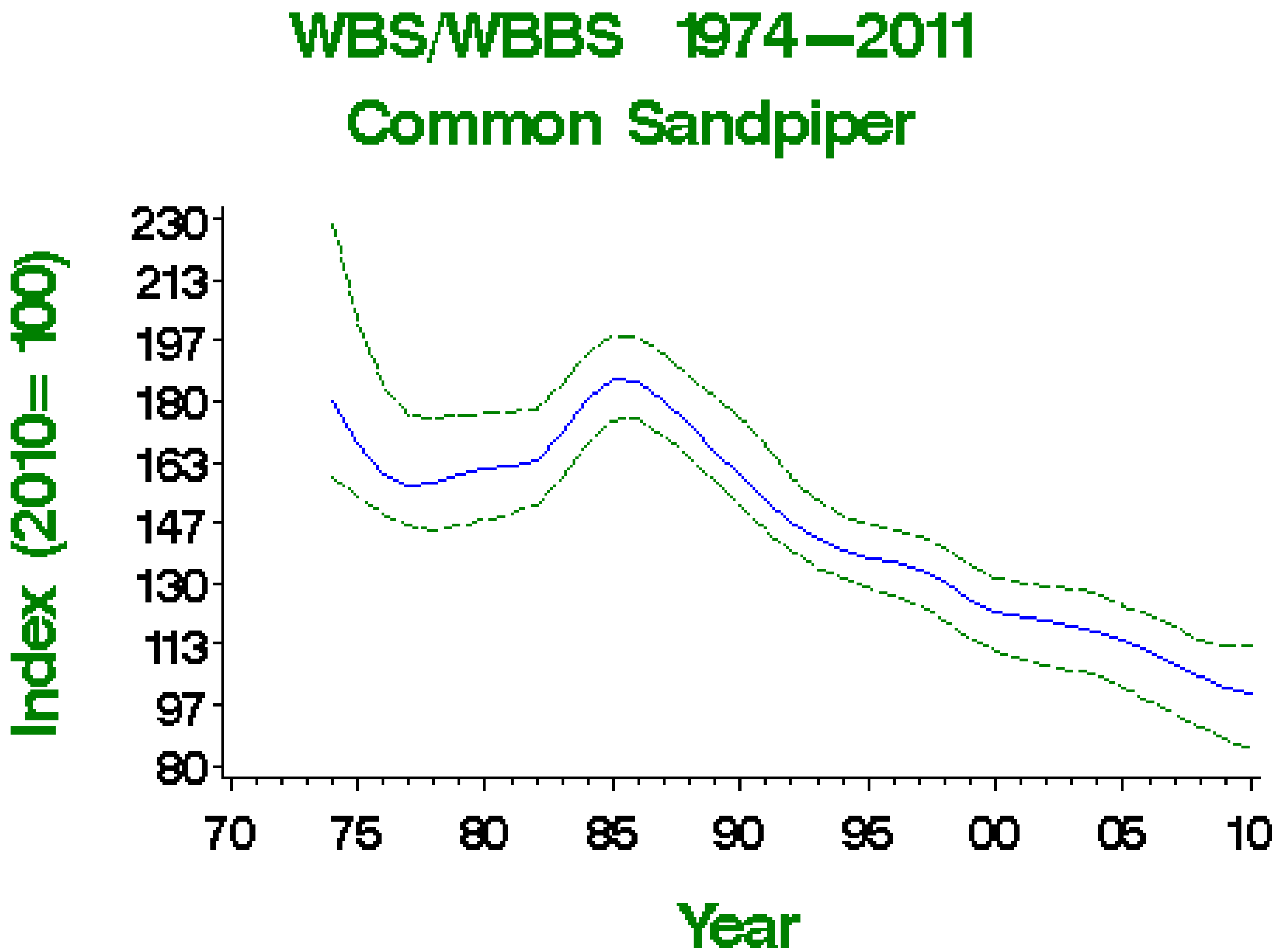
Actitis hypoleucos

Key facts

Conservation listings:	Europe: SPEC category 3 (declining) (BiE04) UK: amber (25-50% population decline) (BoCC3)
Long-term trend:	UK waterways: moderate decline
Population size:	15,000 pairs in 2009 (APEP13: previous estimate (Dougall et al. 2004) updated using WBS/WBBS trend)

Status summary

WBS/WBBS results for this species show a decline from 1985 onwards (after a more gradual increase) that has yet to be explained. The recent decrease is matched by BBS data from Scotland and from the UK as a whole, and warrants a BTO alert. Poorer breeding success and reduced survival of first-year birds over the winter in West Africa were both suggested as possible reasons for the failure of the Peak District population to recover after a hard-weather event in 1989 (Holland & Yalden 2002). The reasons for poor recruitment to the breeding population are hard to assess in the absence of firm information on where British birds spend the winter (Dougall et al. 2010). UK clutch sizes appear to have shown a slight decline since the 1960s. Following declines during the 1990s in the large Swedish and Finnish populations, the European status of this species is no longer considered 'secure' (BirdLife International 2004). Widespread moderate decline across Europe since 1980 has now become evident (PECBMS 2012a). The species has recently been moved to the amber list on the strength of its declines in UK and across Europe.



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

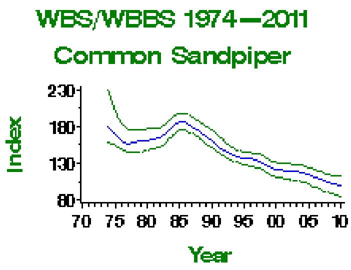
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
WBS/WBBS waterways	35	1975-2010	47	-41	-58	-27	>25	
	25	1985-2010	56	-46	-57	-37	>25	
	10	2000-2010	85	-18	-30	-8		

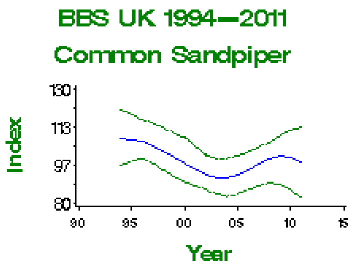
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	5	2005-2010	83	-12	-23	0		
BBS UK	15	1995-2010	66	-7	-29	14		
	10	2000-2010	67	3	-20	24		
	5	2005-2010	74	8	-15	34		
BBS Scotland	15	1995-2010	30	-4	-25	26		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

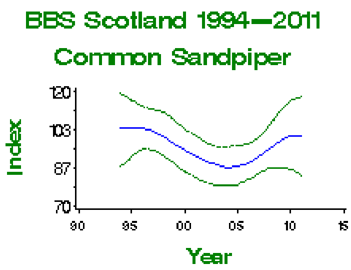
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



WBS/WBBS waterways graph



BBS UK graph

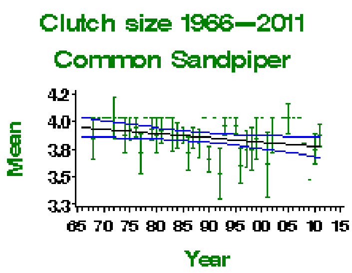


BBS Scotland graph

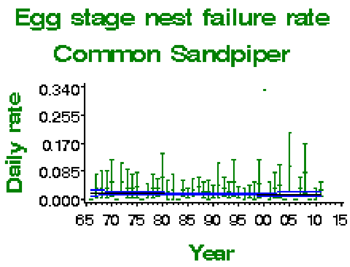
Demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Clutch size	42	1968-2010	12	Linear decline	3.92 eggs	3.77 eggs	-3.8%		Small sample
Nest failure rate at egg stage	42	1968-2010	13	None					Small sample

For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

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Redshank

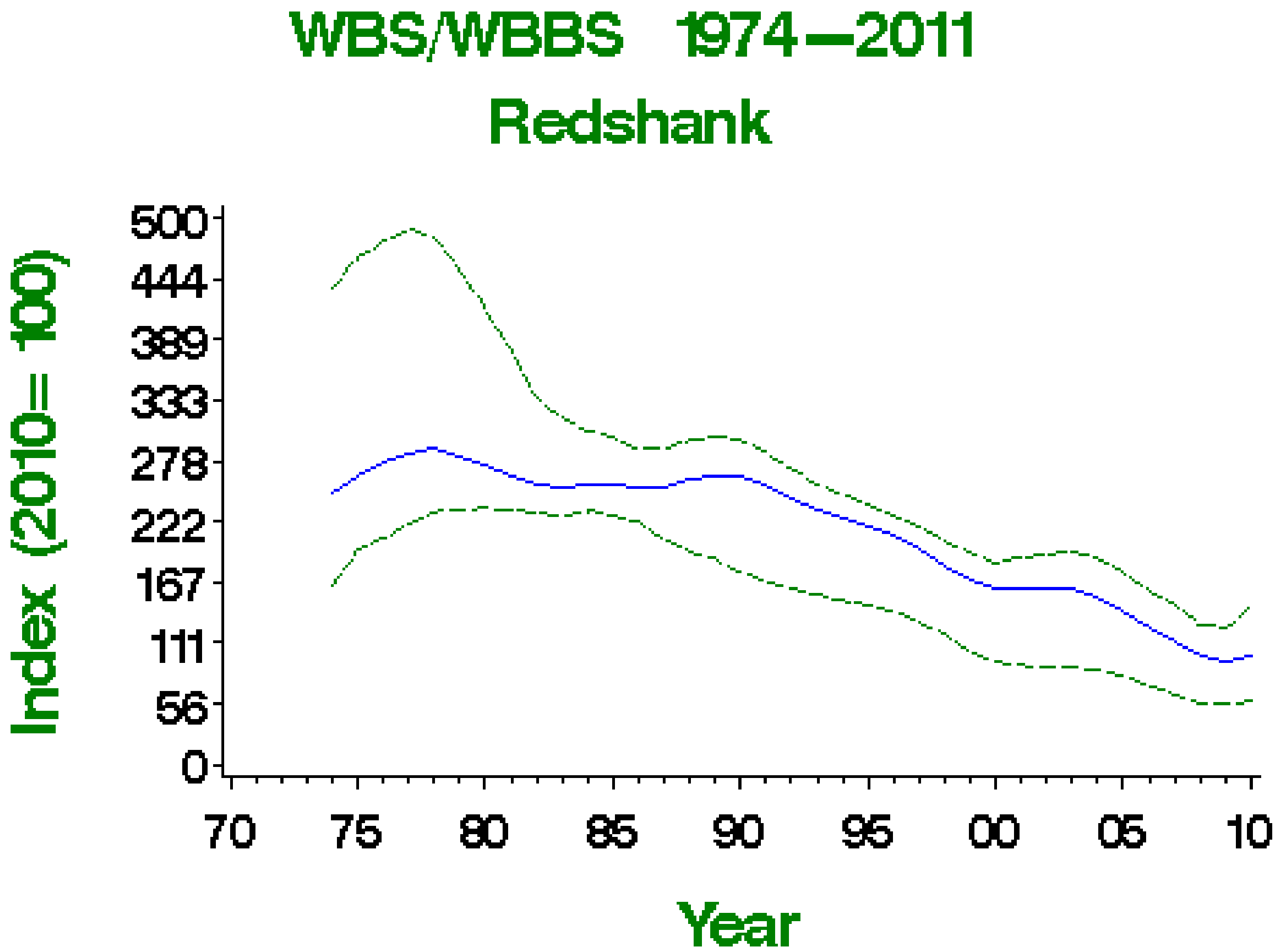
Tringa totanus

Key facts

Conservation listings:	Europe: SPEC category 2 (declining) (BiE04) UK: amber (>50% population decline but data possibly unrepresentative, >20% of East Atlantic Flyway population in winter) (BoCC3)
Long-term trend:	UK: decline UK waterways: rapid decline
Population size:	25,000 pairs in 2009 (APEP13: 1985-99 estimate (O'Brien 2004) updated using CBC/BBS trend)

Status summary

UK population decline has recently been added to the criteria by which Redshank qualifies for amber listing; the scale of decline reported here now meets the red-list criterion, however. Considerable range contraction had occurred from many areas of the UK by 1988-91, probably as a result of the drainage of farmland (Gibbons et al. 1993). WBS/WBBS results show a decline along waterways that apparently accelerated during the 1990s. BBS shows continuing overall decrease. Surveys in England and Wales revealed a decrease of 29% in breeding birds in wet meadows between 1982 and 2002 (Wilson et al. 2005). The substantial section of the British population that nests on saltmarshes decreased by 23% between 1985 and 1996, apparently as a result of increased grazing pressure (Brindley et al. 1998, Norris et al. 1998). Wintering populations (augmented by many Icelandic and some other northern European breeders) have shown some increase since the 1970s but have been in decline since about 2001 (Holt et al. 2012a). The failure rate of nests at the egg stage has fallen steeply since the 1960s. Numbers have shown widespread moderate decrease across Europe since 1980 (PECBMS 2012a). In Scotland at least, agri-environment schemes can benefit this species (O'Brien & Wilson 2011).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
WBS/WBBS waterways	35	1975-2010	24	-62	-88	-24	>50	
	25	1985-2010	26	-61	-80	-35	>50	

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	10	2000-2010	32	-37	-52	-7	>25	
	5	2005-2010	31	-29	-46	3		
BBS UK	15	1995-2010	86	-39	-51	-21	>25	
	10	2000-2010	95	-28	-42	-15	>25	
	5	2005-2010	105	-25	-39	-11	>25	
BBS England	15	1995-2010	60	-33	-51	-13	>25	
	10	2000-2010	69	-41	-57	-24	>25	
	5	2005-2010	78	-28	-43	-12	>25	

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

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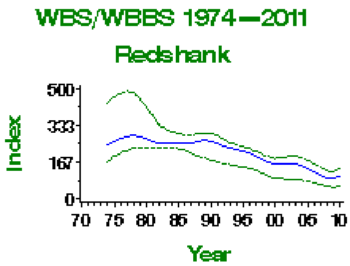
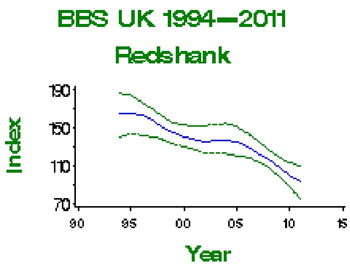
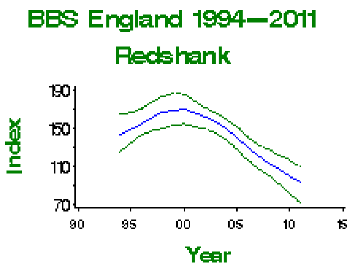


WBS/WBBS waterways graph



BBS UK graph

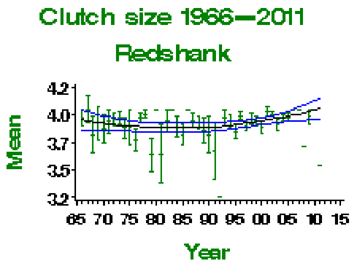


BBS England graph

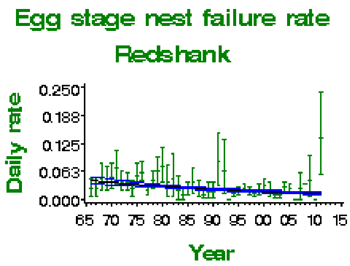
Demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Clutch size	42	1968-2010	29	Curvilinear	3.89 eggs	3.99 eggs	2.6%		Small sample
Nest failure rate at egg stage	42	1968-2010	31	Linear decline	3.99% nests/day	1.37% nests/day	-65.7%		

For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

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Woodcock

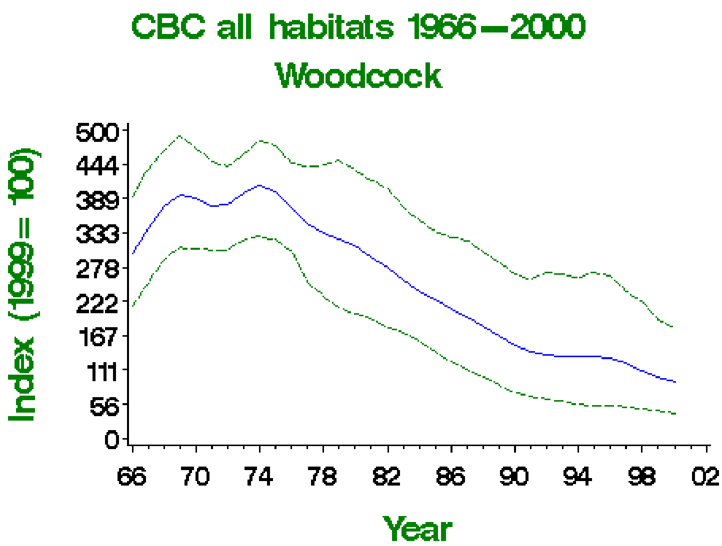
Scolopax rusticola

Key facts

Conservation listings:	Europe: SPEC category 3 (declining) (BiE04) UK: amber (European status) (BoCC3)
Long-term trend:	UK: probable rapid decline
Population size:	81,000 (64,000-100,000) males in 2003 (APEP13: Hoodless et al. 2009)

Status summary

The Woodcock declined rapidly and significantly on CBC plots for the three decades up to 2000. Because CBC did not include many coniferous forests and its plots were concentrated in lowland Britain, however, it is not certain how well this trend represents the whole UK population. Range contractions, that might have had the same cause as the decline in abundance, were recorded concurrently with part of the CBC decline (Gibbons et al. 1993). Recreational disturbance, the drying out of natural woodlands, overgrazing by deer, declining woodland management, and the maturation of new plantations are possible causes of the Woodcock's decline, but there is no strong hypothesis as yet (Fuller et al. 2005). BBS is inefficient at recording this scarce, mainly crepuscular species, and cannot continue the index series. The first special survey aimed at monitoring the UK's breeding Woodcock took place in 2003 and has provided a new, much higher baseline population estimate for future monitoring (Hoodless et al. 2009; also, BoCC3), which now rests on the breeding declines recorded across Europe, especially European Russia (BiE04). Annuahumbers shot in the UK, which include winter visitors from declining populations in Europe, have increased around threefold since 1945 and are currently running at a historically high level.



Smoothed population index, relative to an arbitrary 100 in 1999, with 85% confidence limits in green

Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC all habitats	31	1968-1999	20	-74	-88	-49	>50	Small CBC sample
	25	1974-1999	20	-76	-88	-51	>50	Small CBC sample
	10	1989-1999	13	-40	-62	-11	>25	Small CBC sample
	5	1994-1999	13	-24	-44	-3		Small sample

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB

CBC all habitats graph

Demographic trends

Productivity and survival trends for this species are not currently produced by BTO

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Snipe

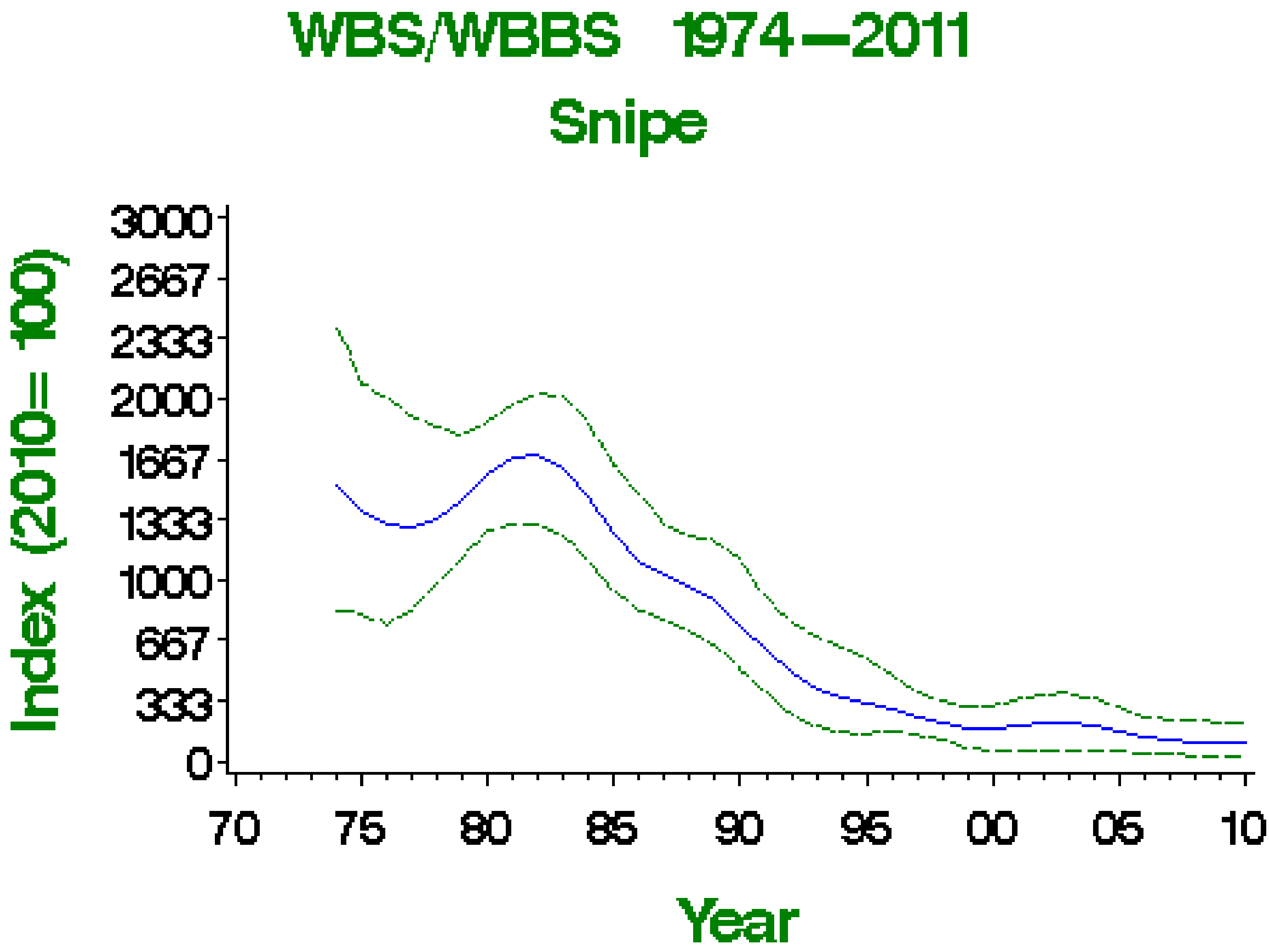
Gallinago gallinago

Key facts

Conservation listings:	Europe: SPEC category 3 (declining) (BiE04) UK: amber (European status) (BoCC3)
Long-term trend:	UK waterways: rapid decline
Population size:	80,000 pairs in 2009 (APEP13: 1985-99 estimate (O'Brien 2004) updated using CBC/BBS trend)

Status summary

Snipe were monitored by the CBC mainly in lowland England, where numbers have fallen rapidly since the 1970s as farmland has been drained (Gibbons et al. 1993, Siriwardena et al. 2000a). The CBC index fell from the early 1970s until 1984, when the number of occupied plots became too small for further monitoring (Marchant et al. 1990), and the graph is not included here. In Northern Ireland, a breeding decline of around 30% occurred between the mid 1980s and 1999 (Henderson et al. 2002). Surveys in England and Wales revealed a decrease of 62% in breeding birds in wet meadows between 1982 and 2002, with the remaining birds becoming highly aggregated into a tiny number of suitable sites (Wilson et al. 2005). Birds were more likely to persist where soils remained soft and wet; the fact that Snipe have continued to decline, despite soil conditions being improved for them at many lowland wetland reserves, suggests that other key aspects of habitat quality, such as prey abundance, are more likely to be driving the decline (Smart et al. 2008). The trend in the upland and moorland strongholds of the species is not fully known, but the 1988-91 atlas documented range loss widely in Wales, Northern Ireland and Scotland, as well as lowland England, and a general decrease is therefore highly probable. The BBS shows increases, especially in Scotland, since 1994, though with little change in recent seasons. Daily nest failure rates at the egg stage appear to have halved. Following moderate decline across Europe since 1980 (PECBMS 2012a), this previously 'secure' species is now provisionally evaluated as 'declining' (BirdLife International 2004). In Scotland at least, agri-environment schemes can benefit this species (O'Brien & Wilson 2011).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

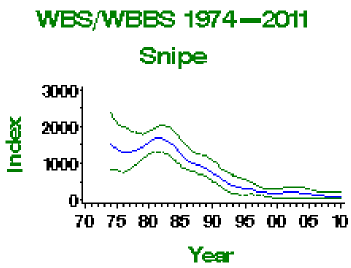
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
WBS/WBBS waterways	35	1975-2010	13	-93	-99	-73	>50	Small sample

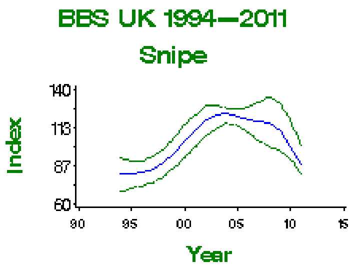
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	25	1985-2010	15	-92	-98	-78	>50	Small sample
	10	2000-2010	24	-44	-70	1		
	5	2005-2010	23	-41	-66	1		
BBS UK	15	1995-2010	163	23	2	70		
	10	2000-2010	183	-4	-21	28		
	5	2005-2010	216	-17	-24	-3		
BBS England	15	1995-2010	87	-13	-28	8		
	10	2000-2010	104	-23	-35	-8		
	5	2005-2010	130	-25	-32	-13	>25	
BBS Scotland	15	1995-2010	56	30	-1	84		
	10	2000-2010	56	-3	-25	38		
	5	2005-2010	62	-16	-26	1		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

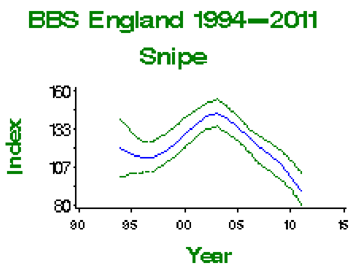
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



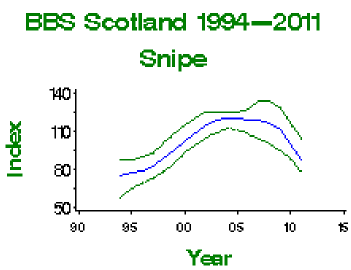
WBS/WBBS waterways graph



BBS UK graph



BBS England graph

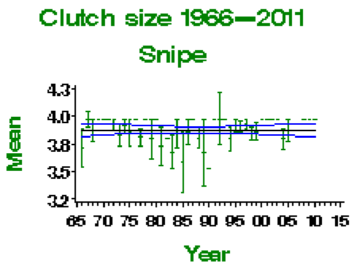


BBS Scotland graph

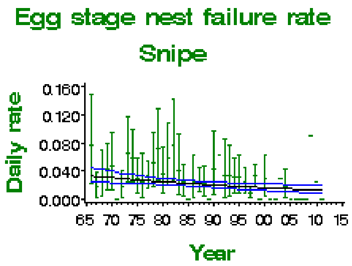
Demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Clutch size	42	1968-2010	13	None					Small sample
Nest failure rate at egg stage	42	1968-2010	14	Linear decline	3.17% nests/day	1.32% nests/day	-58.4%		Small sample

For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Feral Pigeon

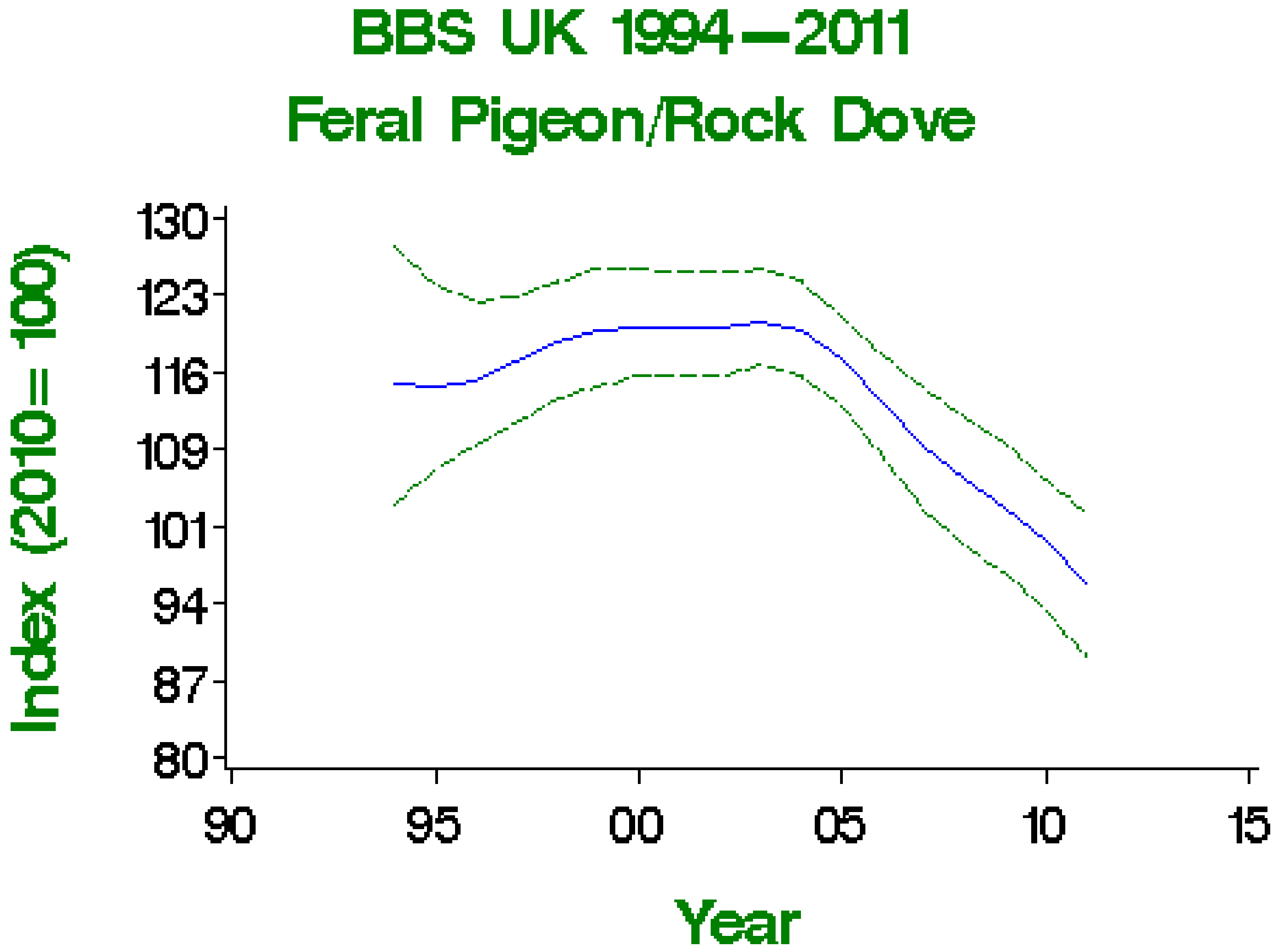
Columba livia f. domestica

Key facts

Conservation listings:	Europe: no SPEC category (favourable conservation status in Europe, not concentrated in Europe) (BiE04) UK: green (Rock Dove C. l. livia) (BoCC3)
Long-term trend:	UK: possible increase
Population size:	550,000 (450,000-650,000) pairs in 2009 (APEP13: distance sampling estimate for 2006 (Newson et al. 2008) updated using BBS trend)

Status summary

CBC samples for Feral Pigeon were consistently too small for annual monitoring, and there was no trend information before BBS began in 1994. Breeding atlas data show a 39% increase in occupied 10-km squares between 1968-72 and 1988-91 (Gibbons et al. 1993), suggesting that Feral Pigeons may be on an upward trajectory, like the other Columba species in the UK. At the time of the first atlas, however, Feral Pigeons were more commonly overlooked during bird surveys, and some of the reported subsequent range increase may have been due to greater observer awareness. It is now clear that Feral Pigeons are almost ubiquitous in the UK, nesting in rural as well as urban habitats, and avoiding only the highest ground. No distinction can realistically be drawn between feral birds of domestic origin and true wild-type Rock Doves, although birds of wild-type plumage still predominate on some more-remote Scottish islands. In field conditions, it is often not possible to distinguish between pure native Rock Doves, wild-nesting Feral Pigeons, semicaptive dovecote breeders, and passing racing pigeons, nor between adults and young of the year, and BBS counts are likely to include birds from all of these groups. BBS indices suggest that a minor decrease has occurred in recent years.



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

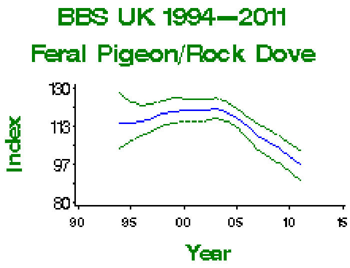
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	15	1995-2010	672	-13	-24	0		
	10	2000-2010	728	-17	-26	-7		

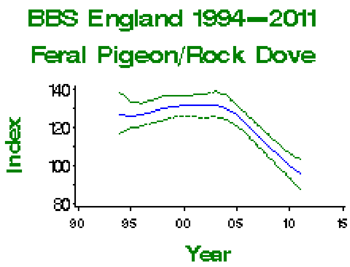
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	5	2005-2010	804	-14	-21	-8		
BBS England	15	1995-2010	559	-20	-29	-11		
	10	2000-2010	601	-24	-32	-15		
	5	2005-2010	663	-21	-28	-13		
BBS Scotland	15	1995-2010	61	11	-27	70		
	10	2000-2010	64	4	-22	40		
	5	2005-2010	72	7	-11	28		
BBS Wales	15	1995-2010	33	38	-7	76		
	10	2000-2010	38	-6	-32	19		
	5	2005-2010	40	-2	-22	21		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

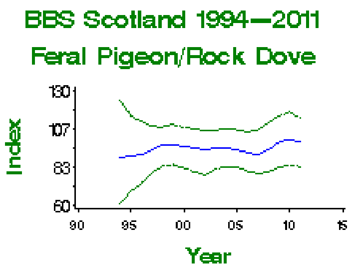
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



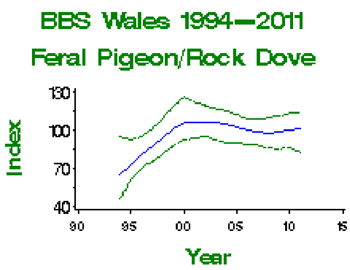
BBS UK graph



BBS England graph



BBS Scotland graph



BBS Wales graph

Demographic trends

Productivity and survival trends for this species are not currently produced by BTO

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Stock Dove

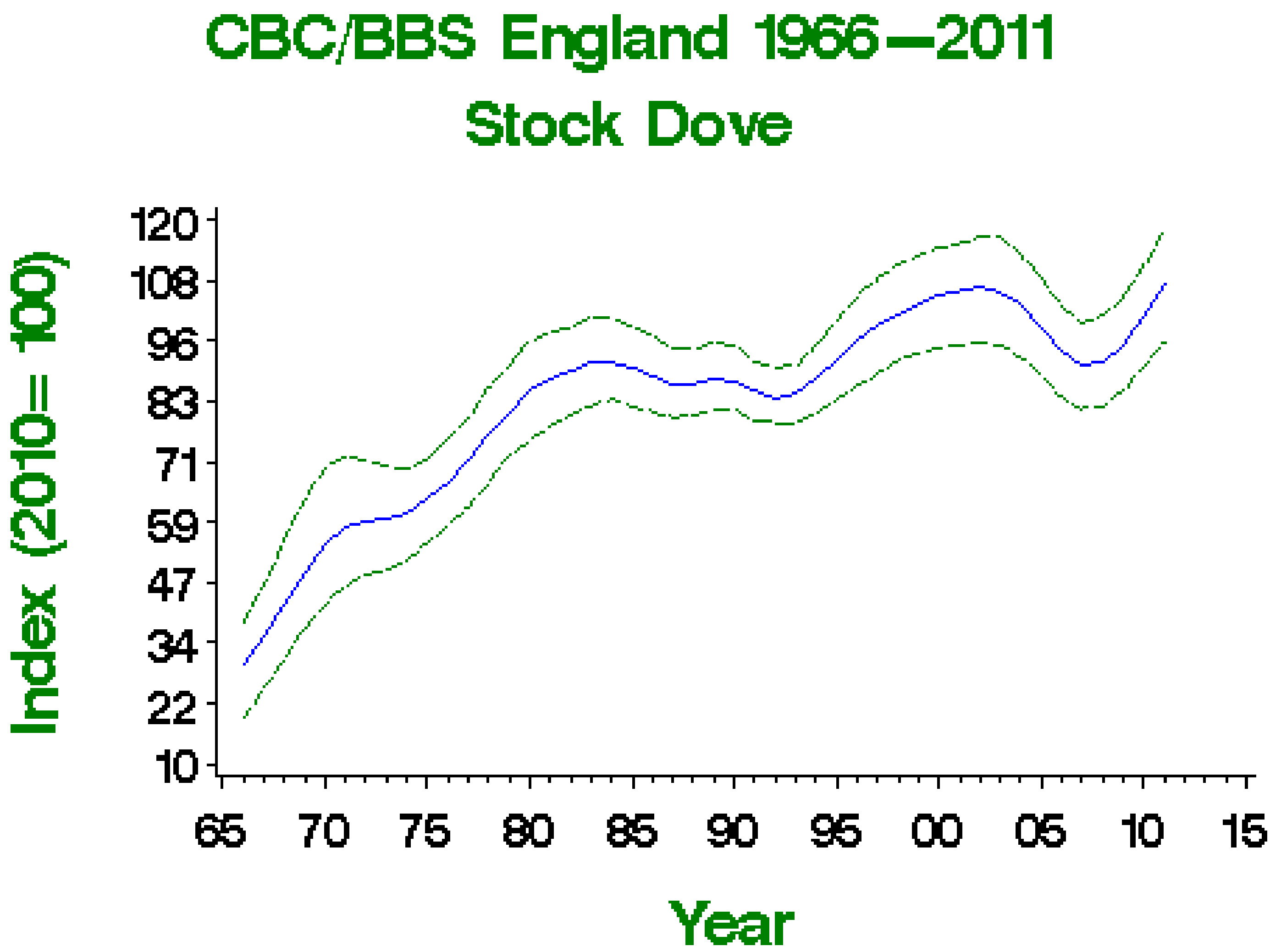
Columba oenas

Key facts

Conservation listings:	Europe: no SPEC category (concentrated in Europe, conservation status favourable) (BiE04) UK: amber (>20% of European breeding population) (BoCC3)
Long-term trend:	England: rapid increase
Population size:	260,000 territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend for England)

Status summary

Following release from the lethal and sublethal effects of the organochlorine seed-dressings used in the 1950s and early 1960s, Stock Dove populations have increased very substantially (O'Connor & Mead 1984). Numbers appeared to level off in the early 1980s, and entered a further increasing phase in the early 1990s which may now have ceased. The BBS Siriwardena et al. 2000b). Overall, nest failure rates have fallen substantially since the 1980s and there has been a major increase in the number of fledglings raised per breeding attempt. There has been little long-term change across Europe since 1980 (PECBMS 2012a).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	43	1967-2010	308	180	90	347		
	25	1985-2010	482	11	-7	39		
	10	2000-2010	777	-4	-11	4		
	5	2005-2010	859	2	-6	10		
BBS UK	15	1995-2010	750	9	-1	21		

Source	10 Period (yrs) 5	2000-2010 Years 2005-2010	825 Plots (n) 913	1 Change (%) 4	-6 Lower limit 3	9 Upper limit 11	Alert	Comment
BBS England	15	1995-2010	691	6	-5	19		
	10	2000-2010	759	-4	-11	5		
	5	2005-2010	838	2	-4	9		

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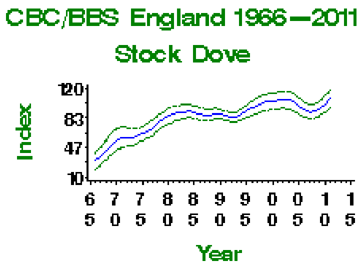
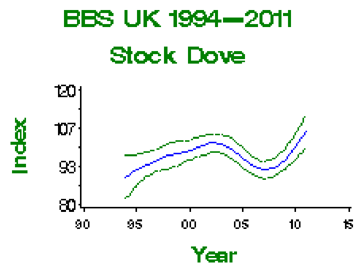
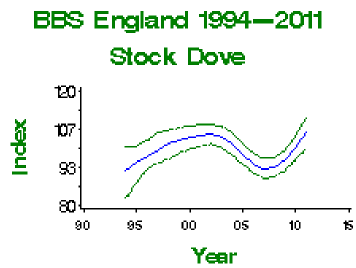


CBC/BBS England graph

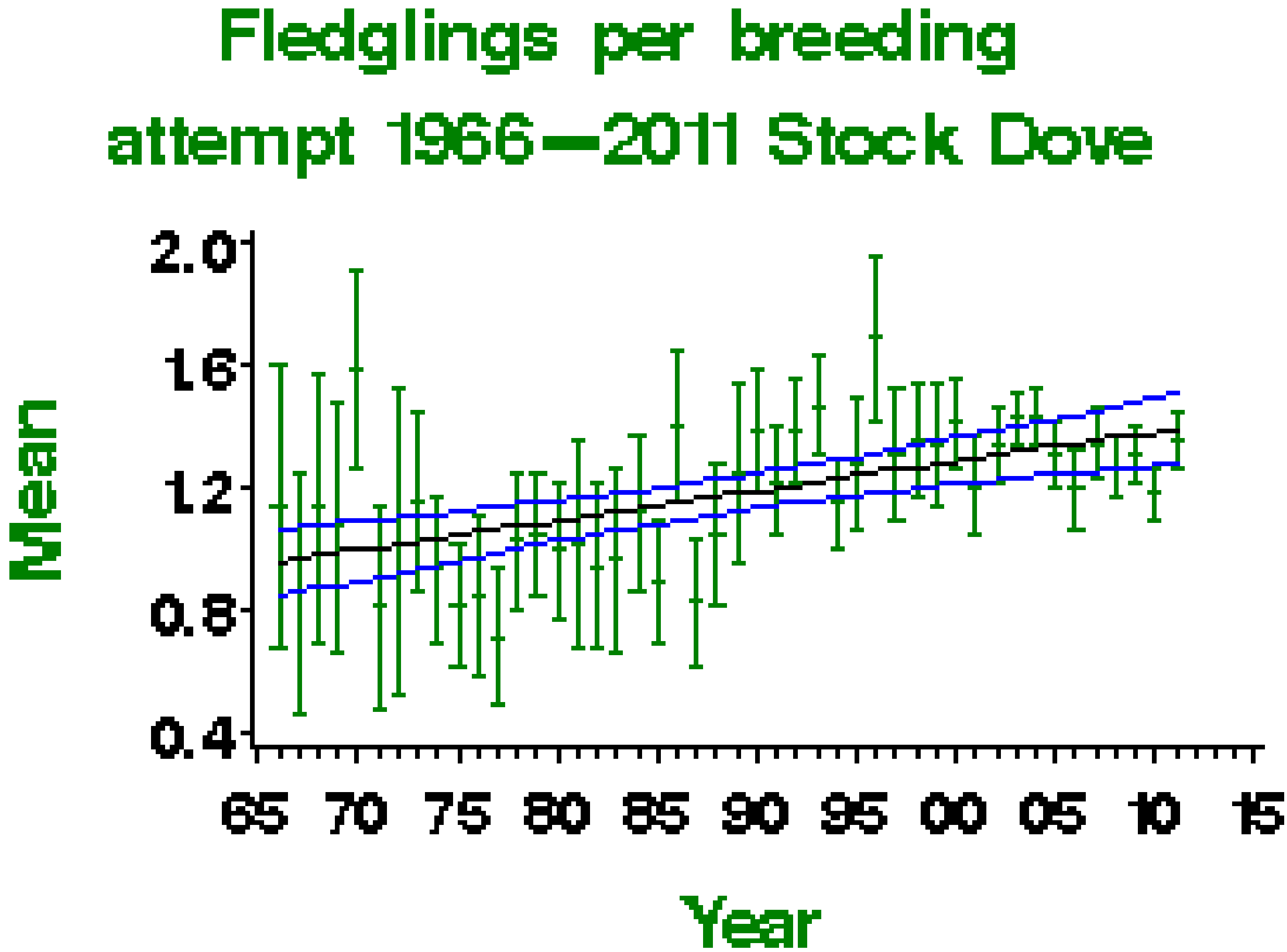


BBS UK graph

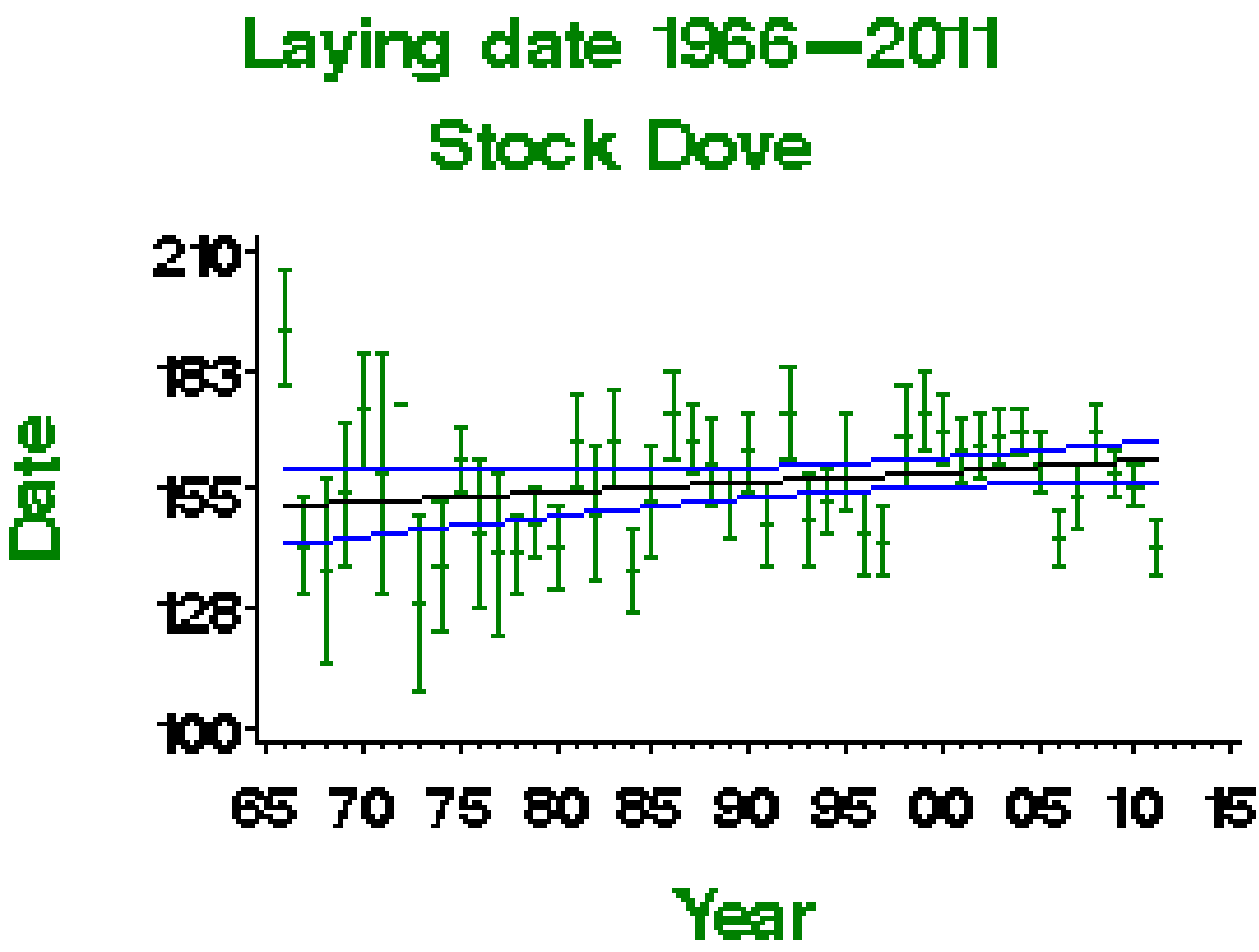


BBS England graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend



Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

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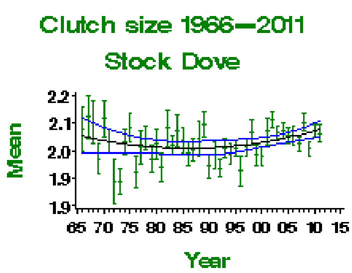
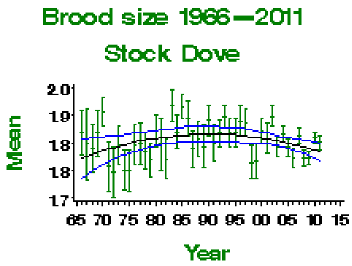
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	70	Linear increase	0.98 fledglings	1.38 fledglings	41.7%		
Clutch size	42	1968-2010	112	Curvilinear	2.07 eggs	2.09 eggs	1.2%		
Brood size	42	1968-2010	168	Curvilinear	1.82 chicks	1.83 chicks	0.6%		
Nest failure rate at egg stage	42	1968-2010	106	Linear decline	1.59% nests/day	0.53% nests/day	-66.7%		
Nest failure rate at chick stage	42	1968-2010	70	Linear decline	1.12% nests/day	0.71% nests/day	-36.6%		
Laying date	42	1968-2010	23	None			0 days		Small sample

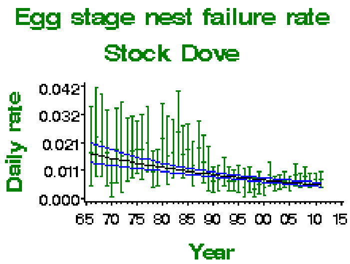
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



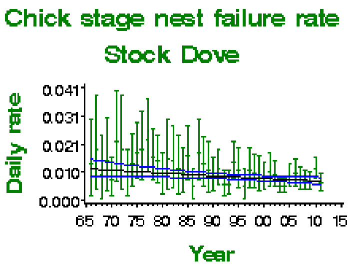
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

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Woodpigeon

Columba palumbus

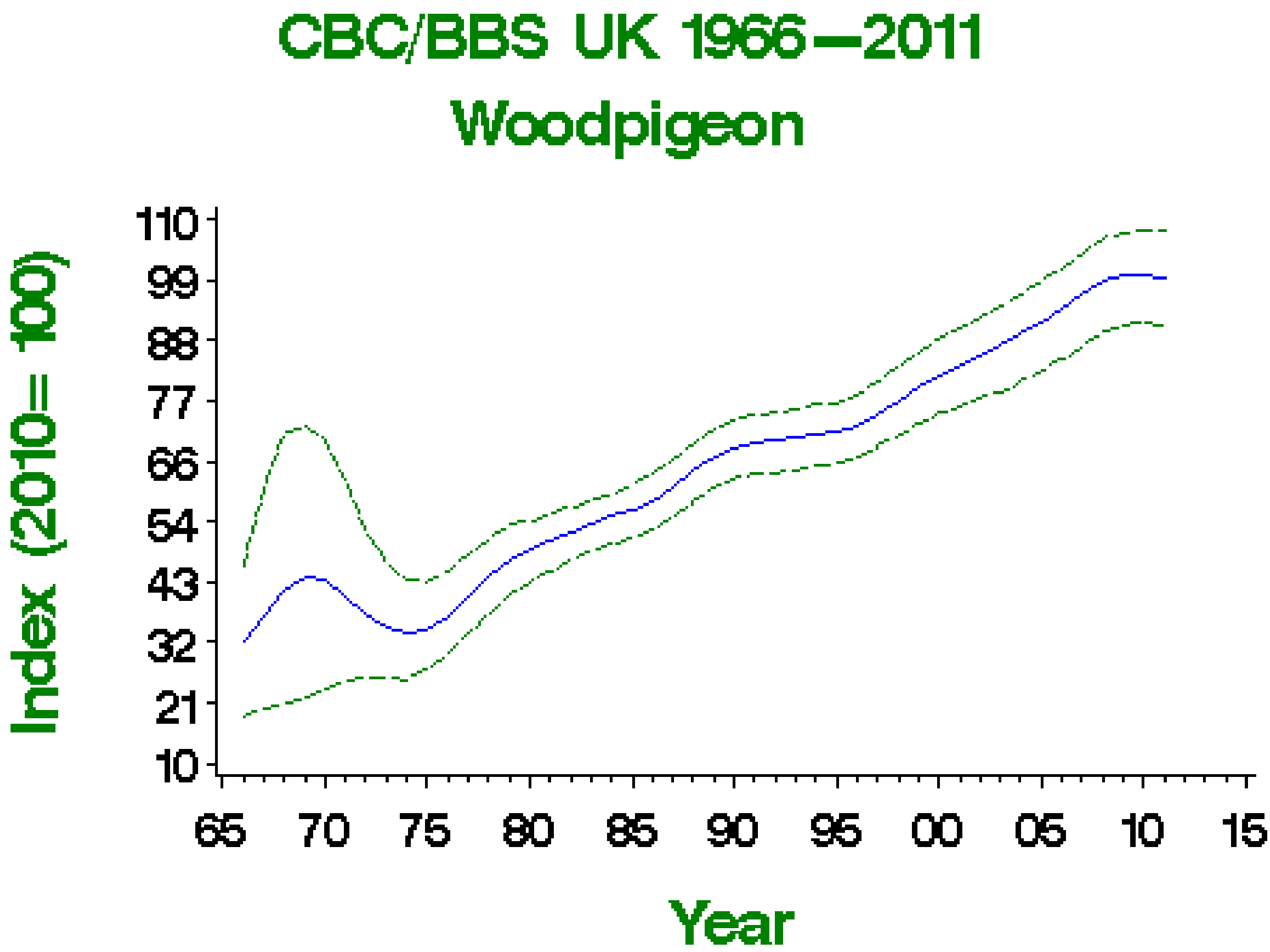
Key facts

Conservation listings:	Europe: no SPEC category (concentrated in Europe, conservation status favourable) (BiE04) UK: green (BoCC3)
Long-term trend:	UK, England: rapid increase
Population size:	5.4 (5.1-5.7) million pairs in 2009 (APEP13: distance sampling estimate for 2006 (Newson et al. 2008) updated using BBS trend)

Migrant status:	Resident
Nesting habitat:	Above-ground nester
Primary breeding habitat:	Farmland
Secondary breeding habitat:	
Breeding diet:	Vegetation
Winter diet:	Vegetation

Status summary

The CBC/BBS trend for this species is of a steady, steep increase since at least the mid 1970s. Since 1994, BBS has recorded significantly upward trends in the UK, and in England, Wales and Northern Ireland separately, but stability in Scotland. The BBS PECBMS 2012a).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	958	169	46	509		
	25	1985-2010	1606	77	58	101		
	10	2000-2010	2724	23	18	27		
	5	2005-2010	3093	10	7	13		
CBC/BBS England	43	1967-2010	770	189	47	511		
	25	1985-2010	1290	88	64	113		
	10	2000-2010	2176	26	20	30		
	5	2005-2010	2485	10	7	13		
BBS UK	15	1995-2010	2401	37	31	44		
	10	2000-2010	2657	22	18	26		
	5	2005-2010	3002	9	7	12		
BBS England	15	1995-2010	1926	44	37	51		
	10	2000-2010	2131	26	21	31		
	5	2005-2010	2426	9	6	12		
BBS Scotland	15	1995-2010	193	0	-17	20		
	10	2000-2010	206	1	-10	12		
	5	2005-2010	234	4	-6	13		
BBS Wales	15	1995-2010	186	41	20	65		
	10	2000-2010	209	30	10	52		
	5	2005-2010	220	14	-3	34		
BBS N.Ireland	15	1995-2010	82	84	36	126		
	10	2000-2010	96	23	7	35		
	5	2005-2010	104	12	-1	23		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

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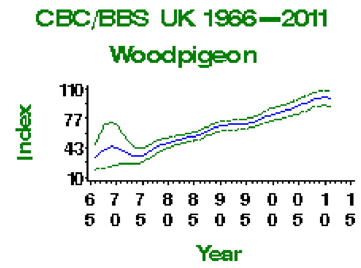
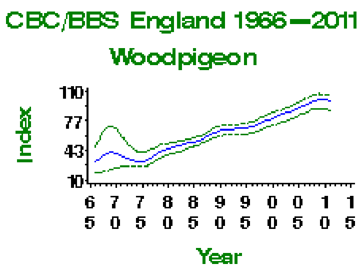
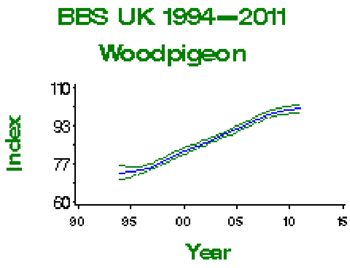


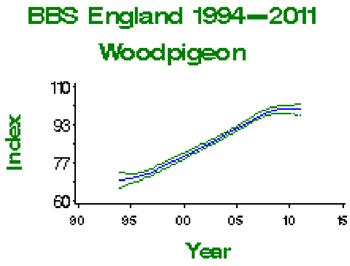
CBC/BBS UK graph



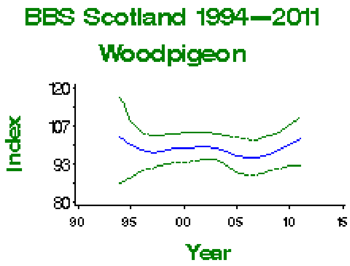
CBC/BBS England graph



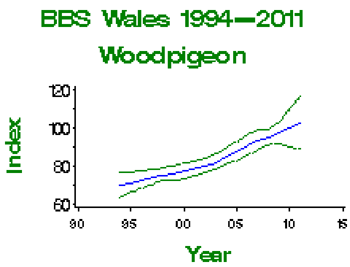
BBS UK graph



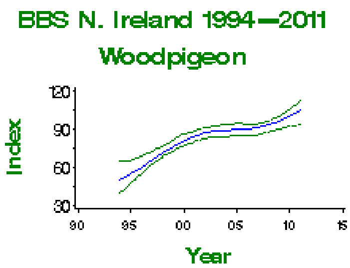
BBS England graph



BBS Scotland graph

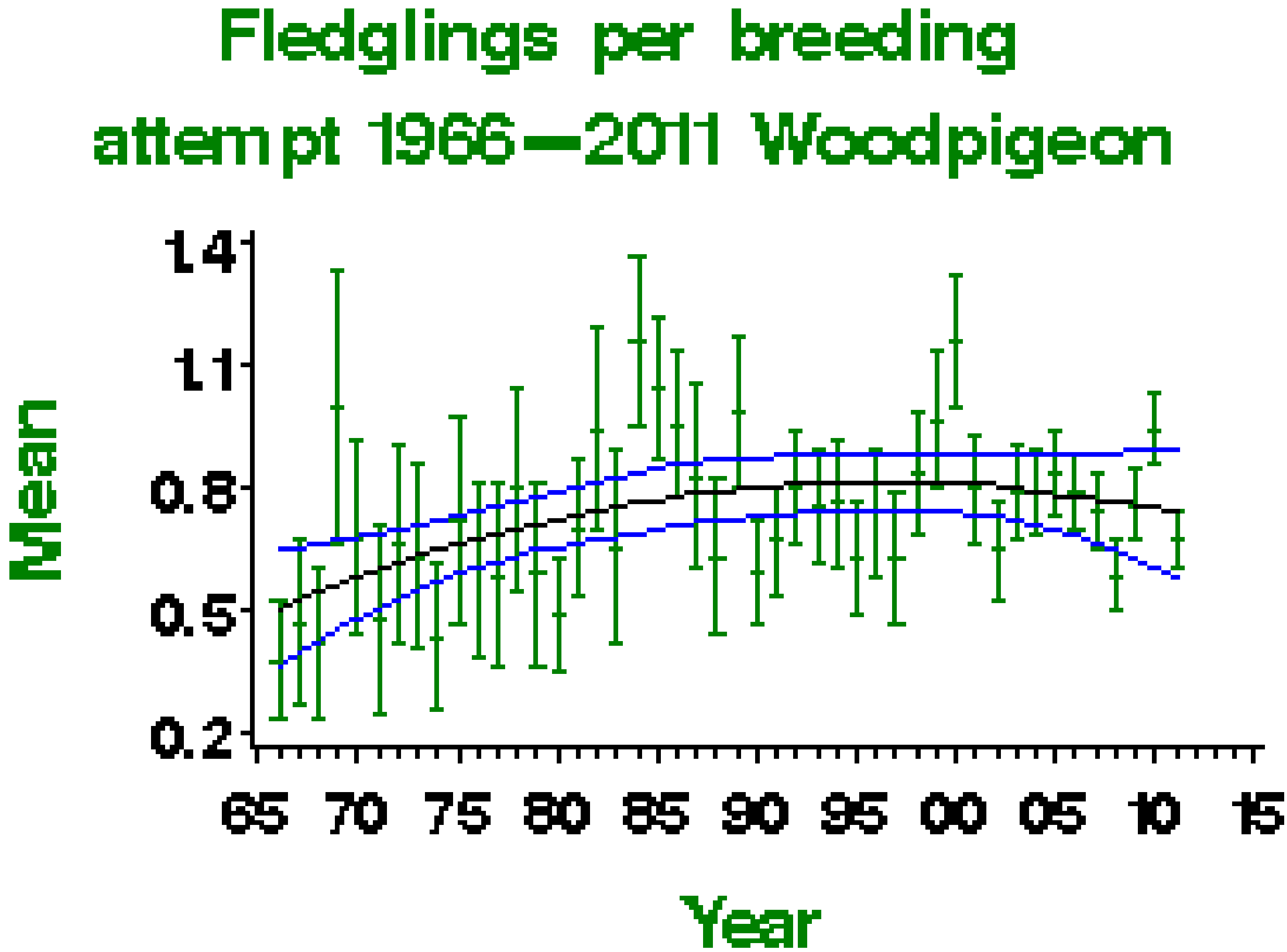


BBS Wales graph

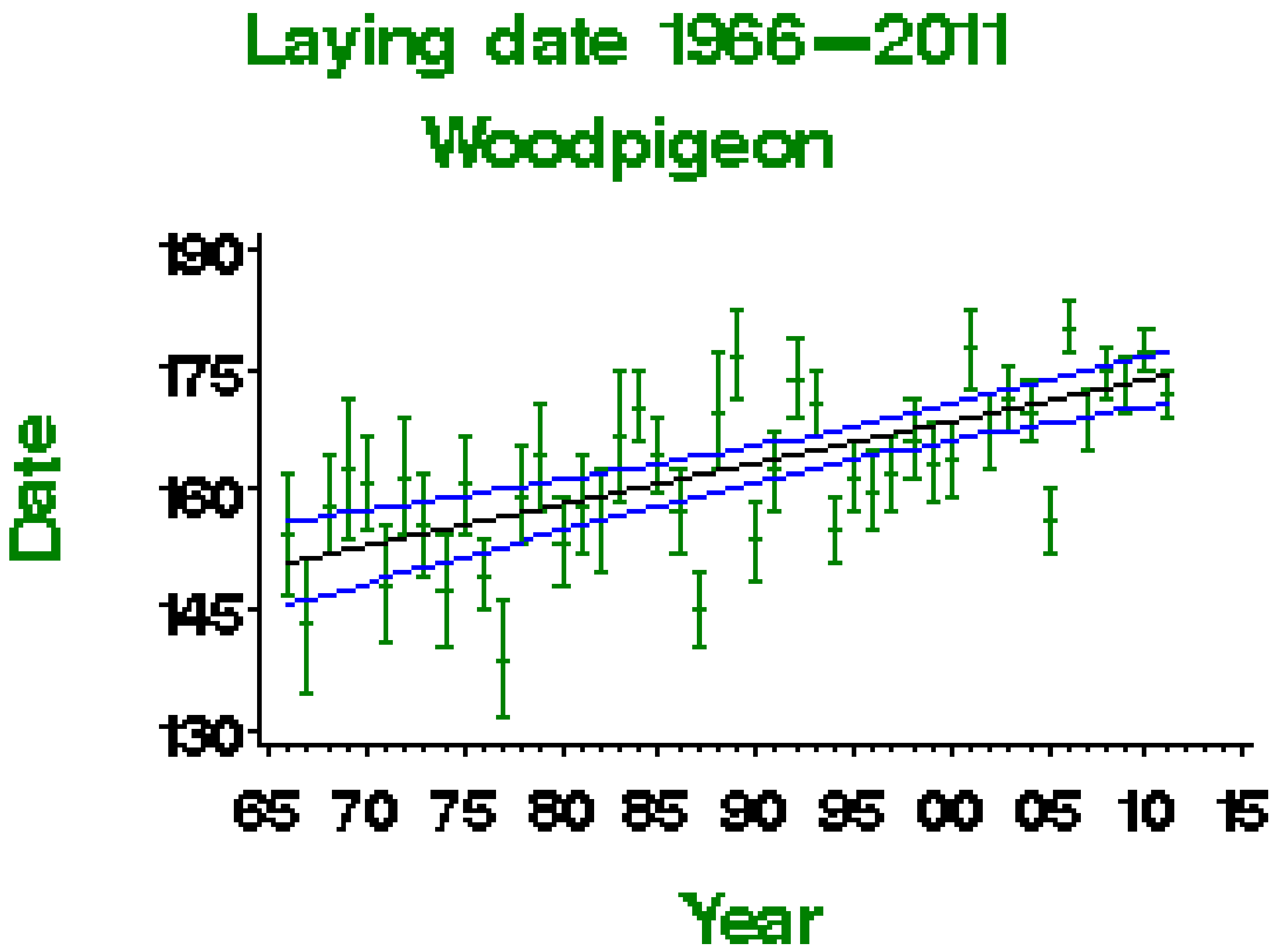


BBS N.Ireland graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

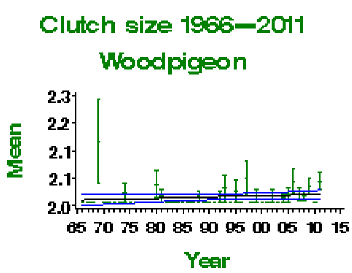


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

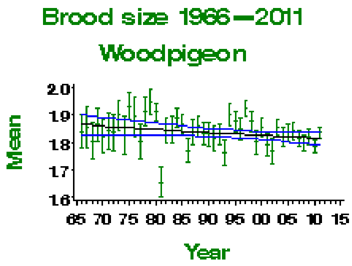
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	73	Curvilinear	0.54 fledglings	0.75 fledglings	37.9%		
Clutch size	42	1968-2010	71	None					
Brood size	42	1968-2010	112	None					
Nest failure rate at egg stage	42	1968-2010	93	Curvilinear	4.51% nests/day	2.93% nests/day	-35.0%		
Nest failure rate at chick stage	42	1968-2010	74	None					
Laying date	42	1968-2010	83	Linear increase	Jun 1	Jun 22	21 days		

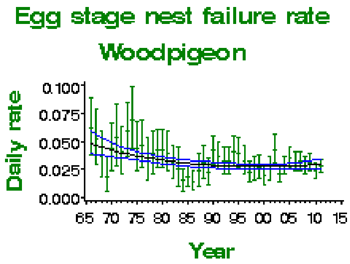
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



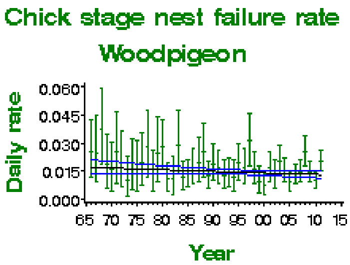
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

Causes of change

There is some evidence that the increase in this species has been due to the spread of intensive winter cereal and rape cultivation, probably by increasing food availability over winter, reflecting the species' ability to subsist on green vegetation, unlike other granivores.

Change factor	Primary driver	Secondary driver
Demographic	Increased overwinter survival	
Ecological	Agricultural intensification	

Further information on causes of change

There are few studies specifically examining demographic and ecological drivers of the long-term increase in this species but the spread of intensive arable cultivation, especially of oilseed rape and winter-sown cereal, which has been shown to reduce overwinter mortality, may explain the rise in numbers (Gibbons et al. 1993, Inglis et al. 1997). Inglis et al. (1997) conducted fieldwork to provide good evidence that, in their study area in Cambridgeshire, the overwintering population size was determined by the area of oilseed rape. Inglis et al. state that, since the introduction of oilseed rape, the number of fledged young produced has a more important effect upon the Woodpigeon population size than does overwinter mortality from starvation, i.e. winter food availability no longer limits the population.

The number of Woodpigeons feeding in gardens has also increased (Glue 1993, 1995, 1997), suggesting that this species may benefit from the trend of increasing urban feeding sites, although there is no direct evidence to support this.

The species is adaptable and O'Connor & Shrubb (1986) found that the breeding season had advanced in response to the switch to autumn sowing, and thus earlier ripening, of cereals, with more pairs nesting in May and June and relatively fewer during July-September. Climate change may have also permitted earlier nesting. A trend toward earlier nesting could have led CBC, with its fieldwork finishing in early July, to overestimate the rate of increase (Marchant et al. 1990). Newly available data indicate, however, that the species is now nesting almost three weeks later, on average, than it did in the 1960s.

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Collared Dove

Streptopelia decaocto

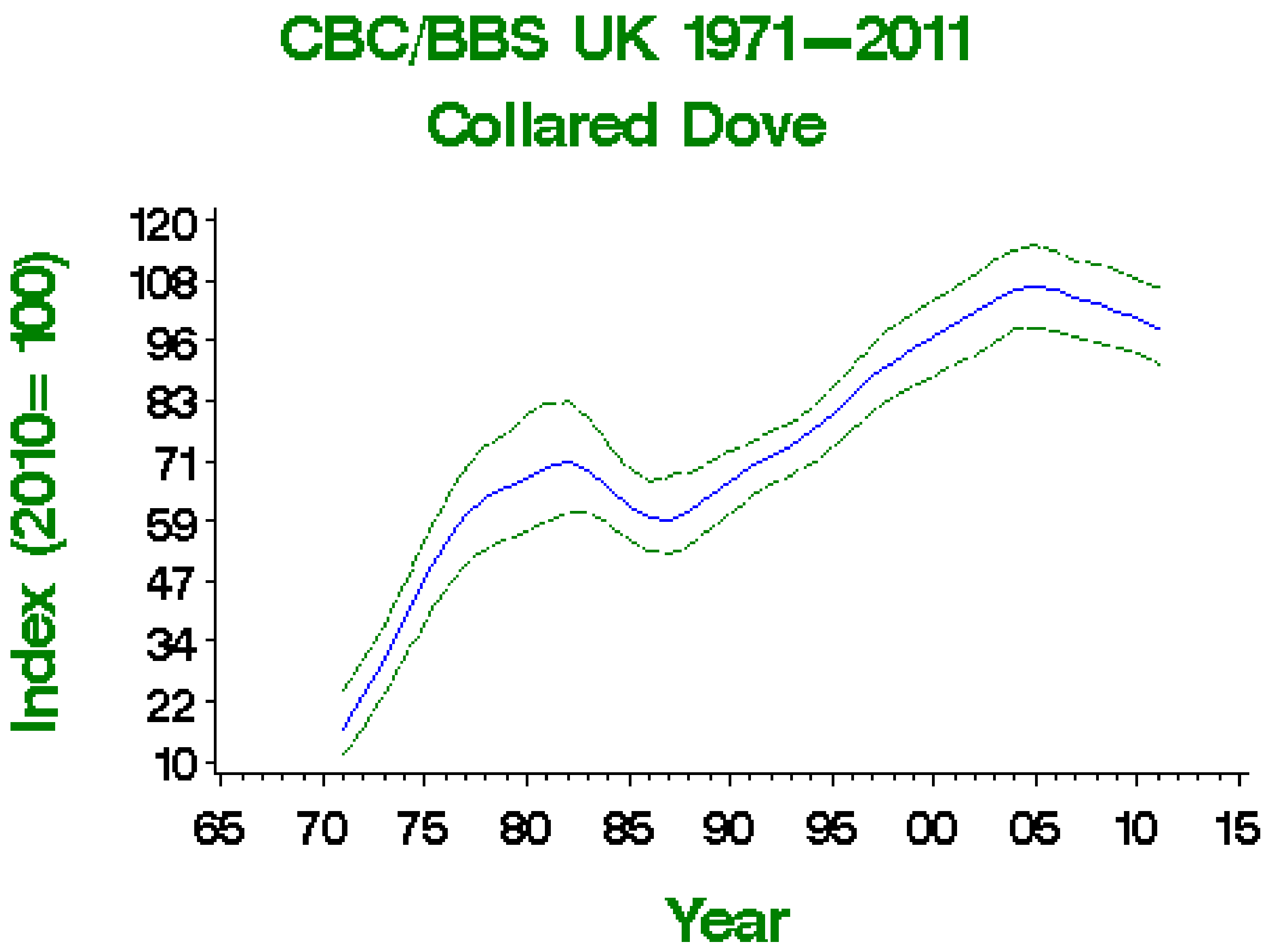
Key facts

Conservation listings:	Europe: no SPEC category (favourable conservation status in Europe, not concentrated in Europe) (BiE04) UK: green (BoCC3)
Long-term trend:	UK, England: rapid increase
Population size:	990,000 (900,000-1,090,000) pairs in 2009 (APEP13: distance sampling estimate for 2006 (Newson et al. 2008) updated using BBS trend)

Migrant status:	Resident
Nesting habitat:	Above-ground nester
Primary breeding habitat:	Human habitats
Secondary breeding habitat:	
Breeding diet:	Vegetation
Winter diet:	Vegetation

Status summary

Collared Dove abundance has increased rapidly since the species first colonised Britain in 1955. From just four birds known to be present in that year, the population was put conservatively at 15,000-25,000 pairs by 1970 (Hudson 1972). The CBC index showed an almost exponential rise as colonisation continued during the early 1970s, but the CBC index had levelled off by about 1980. BBS shows continuing increases, at least in England and Wales, with a recent levelling off nationally. The BBS PECBMS 2012a).



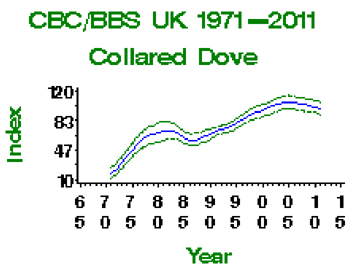
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

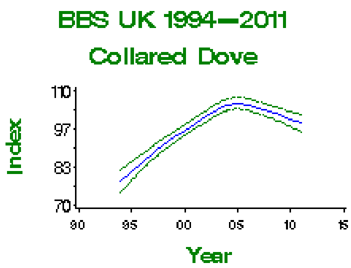
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	535	2074	722	10692		
	25	1985-2010	876	62	31	94		
	10	2000-2010	1497	4	-1	9		
	5	2005-2010	1692	-6	-10	-3		
BBS UK	15	1995-2010	1325	23	15	30		
	10	2000-2010	1482	4	-1	10		
	5	2005-2010	1676	-5	-8	-2		
BBS England	15	1995-2010	1164	22	15	30		
	10	2000-2010	1294	3	-1	7		
	5	2005-2010	1460	-6	-9	-2		
BBS Scotland	15	1995-2010	49	-7	-34	31		
	10	2000-2010	55	17	-10	50		
	5	2005-2010	67	0	-19	21		
BBS Wales	15	1995-2010	72	52	14	97		
	10	2000-2010	83	18	3	34		
	5	2005-2010	91	0	-9	12		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

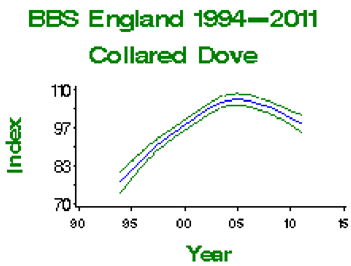
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



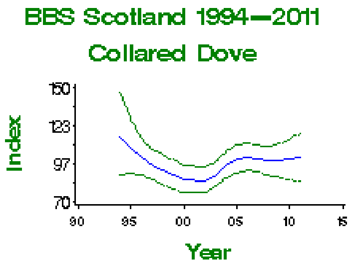
CBC/BBS UK graph



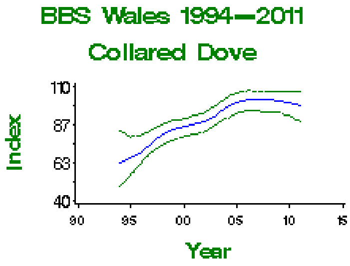
BBS UK graph



BBS England graph

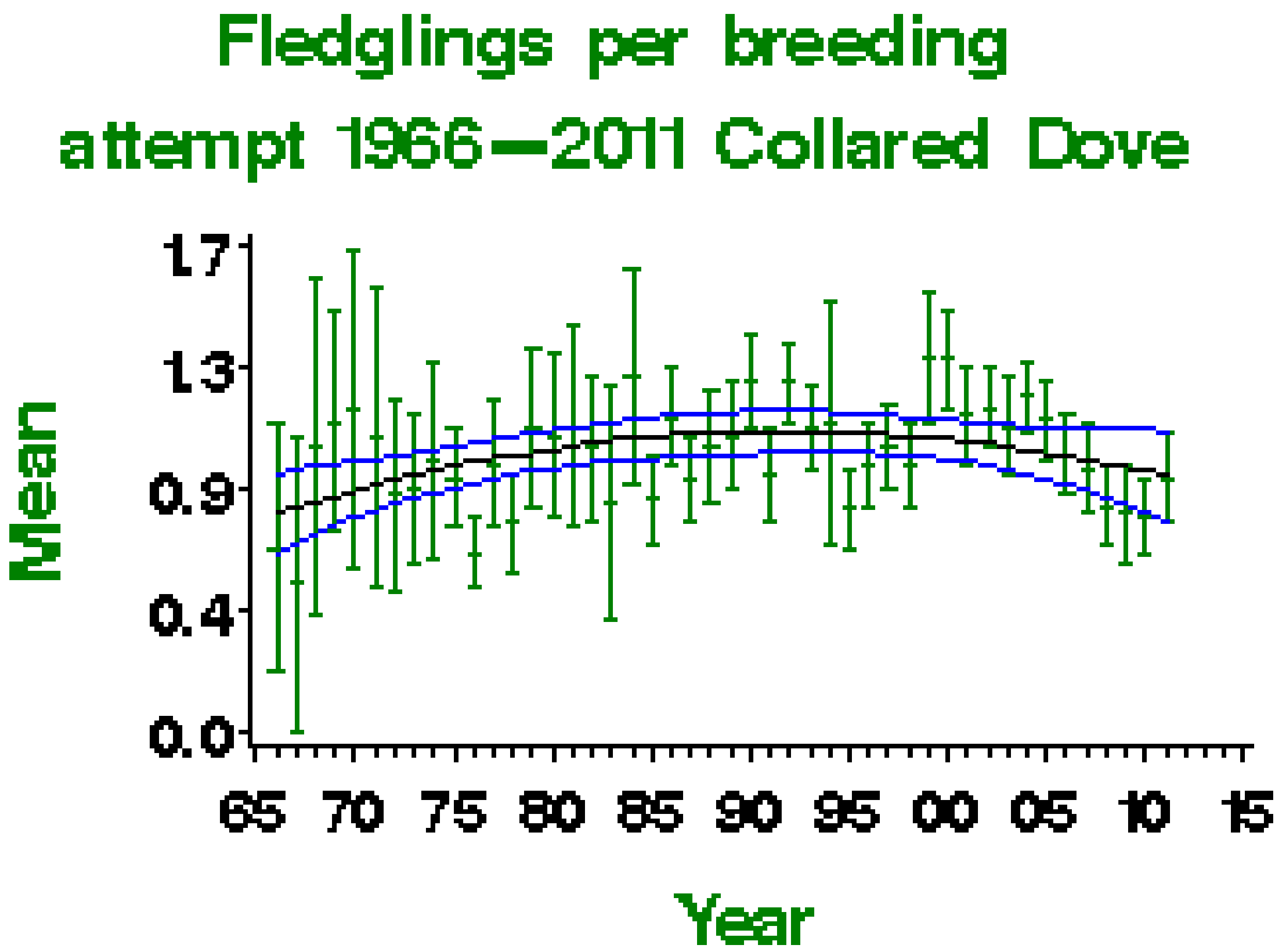


BBS Scotland graph

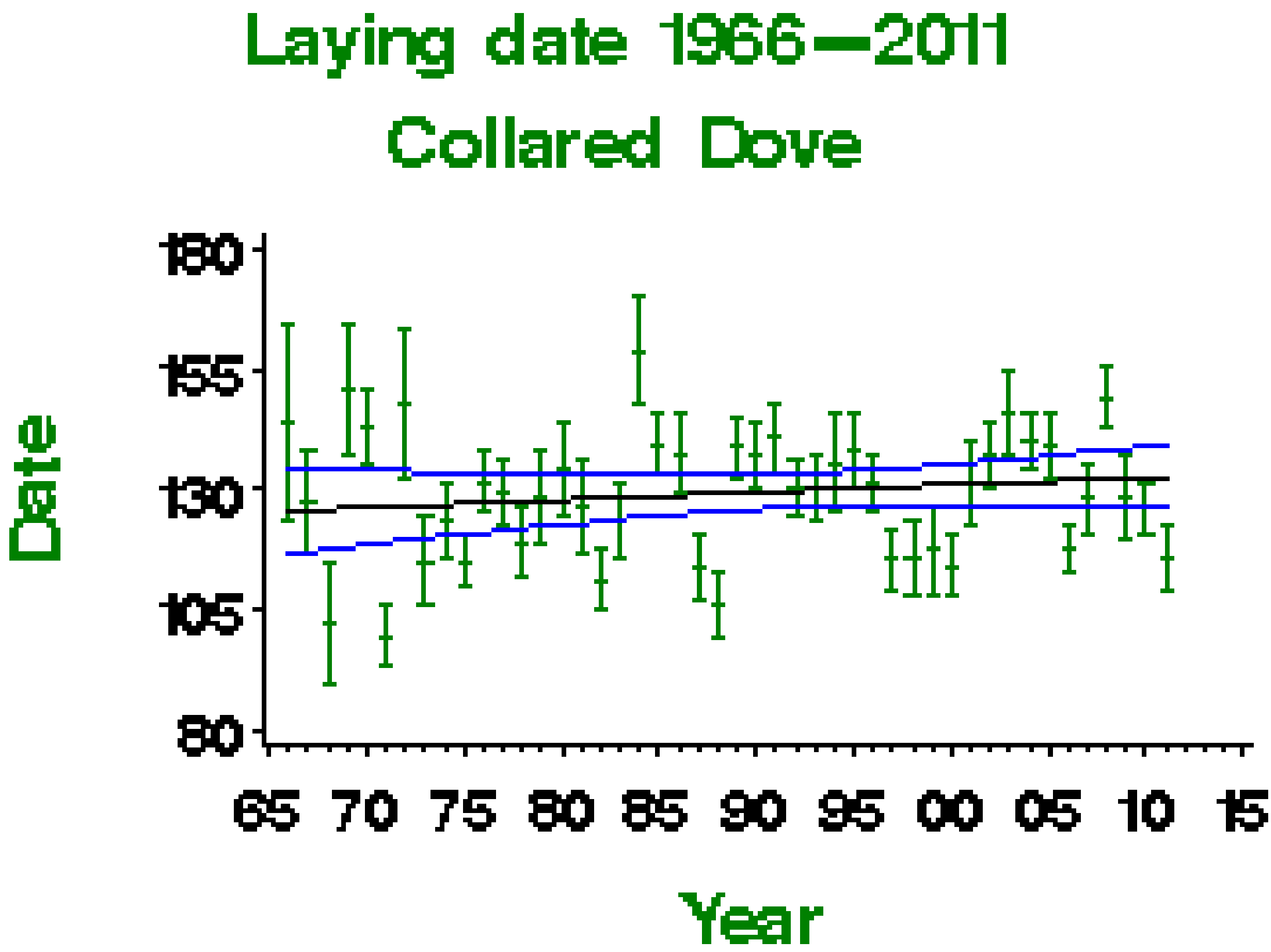


BBS Wales graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend



Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

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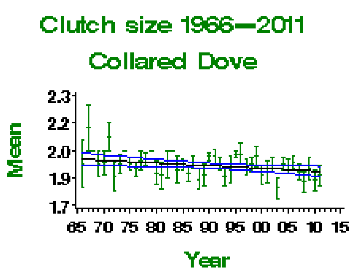
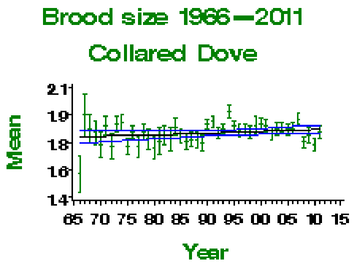
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	54	Curvilinear	0.81 fledglings	0.92 fledglings	13.2%		
Clutch size	42	1968-2010	43	Linear decline	1.95 eggs	1.88 eggs	-3.2%		
Brood size	42	1968-2010	73	None					
Nest failure rate at egg stage	42	1968-2010	61	Curvilinear	3.23% nests/day	2.84% nests/day	-12.1%		
Nest failure rate at chick stage	42	1968-2010	55	None					
Laying date	42	1968-2010	44	None			0 days		

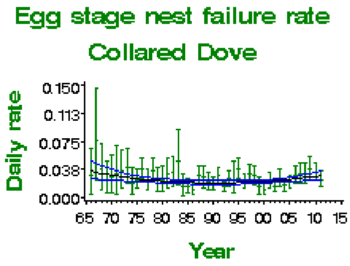
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



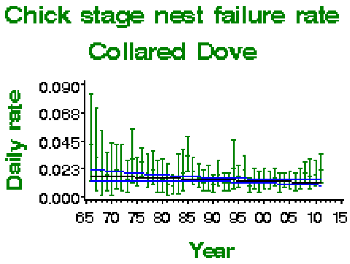
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

Causes of change

There is little evidence available relating to the drivers of the increase in this species but it appears to have been able to fill an empty niche and exploit the intermittent seed resources available in gardens and may also benefit from milder winters. Given the continuing rise, there is no baseline of 'stability' against which to compare demographic rates that might be causing a change but there have been increases in brood size and lower daily failure rates at the chick stage.

Change factor	Primary driver	Secondary driver
Demographic	Increased breeding success	
Ecological	Other	Climate change

Further information on causes of change

There are very few studies from the UK looking at the causes of population change in Collared Dove. There has been a linear increase in brood size and a linear decline in daily failure rate at the chick stage (see graphs above). The species appears to have filled a previously empty niche, perhaps because it is able to adapt to new environments, and it has shown a rapid increase in gardens, exploiting the intermittent seed resources available. It may also benefit from milder winters, which the species can exploit with its long breeding seasons. However, evidence for this is anecdotal.

Robertson (1990) measured high productivity and a long breeding season in rural Collared Doves in Oxfordshire and suggested that these were made possible by feeding on superabundant, predictable and persistent supplies of commercial crop seed in and around farmyards. However, there is little evidence based on specific analyses to support this.

There is evidence that the recent slowing of population increase may be due to increasing numbers of grey squirrels, as Newson et al. (2010b) provided good evidence from nest record data which showed a positive relationship between nest failure at the egg stage and squirrel abundance. They may also be reaching the saturation of their niche. Population trends have been different trend in Scotland but the reasons for this are unclear.

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Turtle Dove

Streptopelia turtur

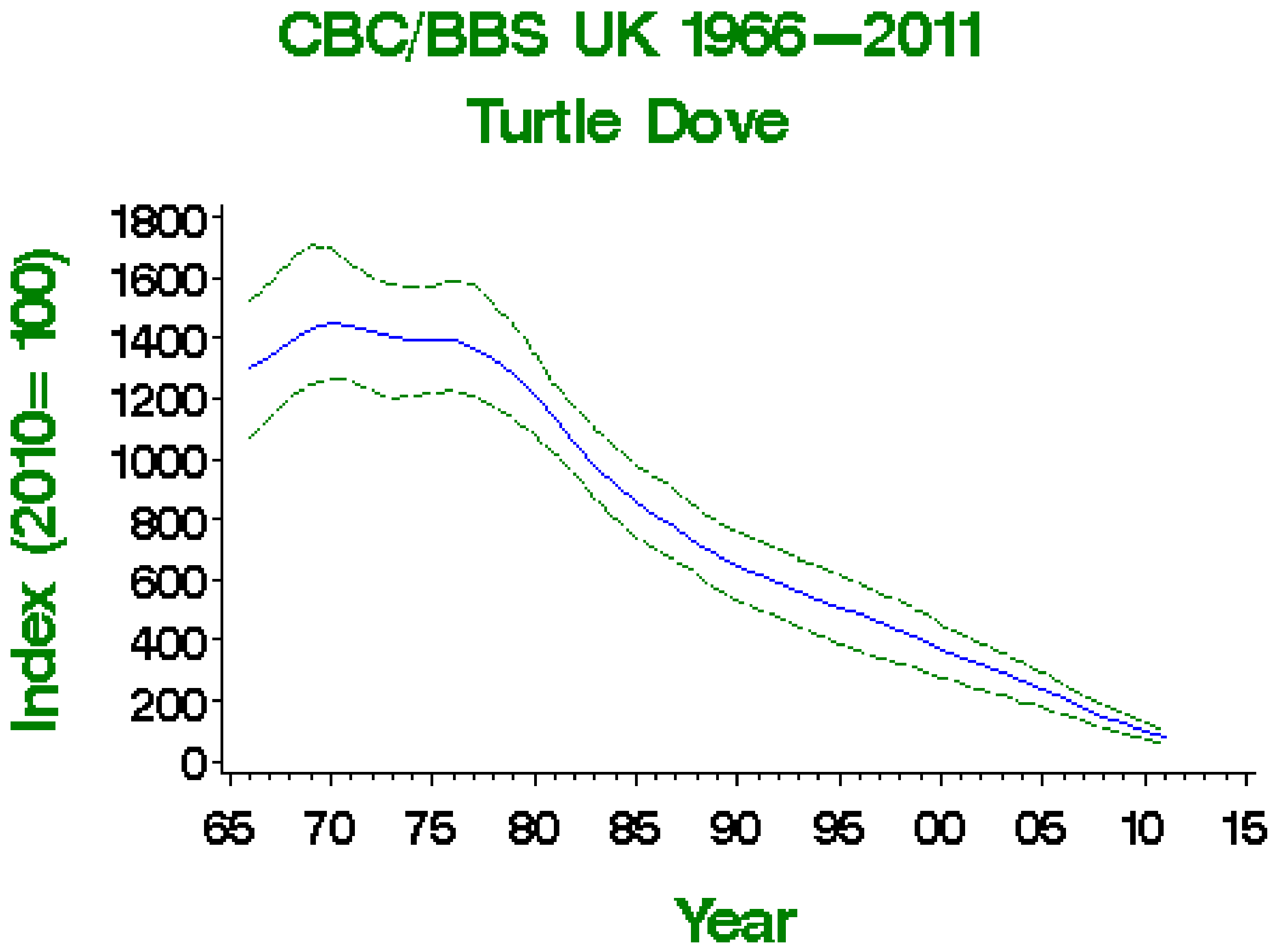
Key facts

Conservation listings:	Europe: SPEC category 3 (declining) (BiE04) UK: red (>50% population decline) (BoCC3) UK Biodiversity Action Plan: click here, priority species
Long-term trend:	UK, England: rapid decline
Population size:	14,000 territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Migrant status:	Long-distance migrant
Nesting habitat:	Above-ground nester
Primary breeding habitat:	Farmland
Secondary breeding habitat:	
Breeding diet:	Vegetation
Winter diet:	Vegetation

Status summary

The CBC/BBS trend shows severe declines in Turtle Dove abundance, beginning in the late 1970s and continuing to the present. Turtle Dove is one of the most strongly declining bird species across Europe since 1980 (PECBMS 2012a).



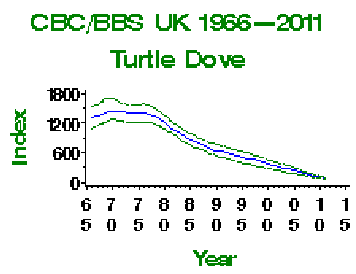
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

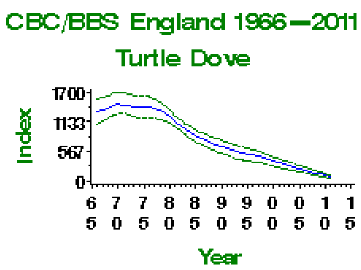
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	107	-93	-95	-89	>50	
	25	1985-2010	131	-88	-92	-84	>50	
	10	2000-2010	148	-73	-77	-67	>50	
	5	2005-2010	131	-58	-63	-51	>50	
CBC/BBS England	43	1967-2010	106	-93	-95	-88	>50	
	25	1985-2010	129	-88	-92	-84	>50	
	10	2000-2010	146	-73	-77	-67	>50	
	5	2005-2010	129	-59	-64	-51	>50	
BBS UK	15	1995-2010	165	-80	-83	-76	>50	
	10	2000-2010	146	-73	-76	-68	>50	
	5	2005-2010	129	-58	-63	-51	>50	
BBS England	15	1995-2010	162	-81	-84	-76	>50	
	10	2000-2010	143	-73	-77	-67	>50	
	5	2005-2010	128	-59	-63	-51	>50	

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

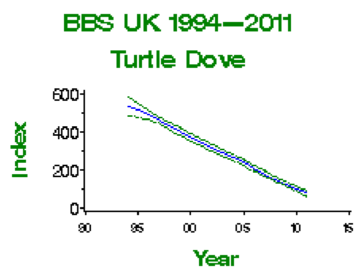
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



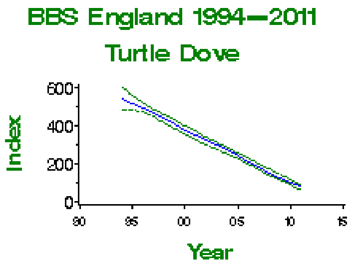
CBC/BBS UK graph



CBC/BBS England graph

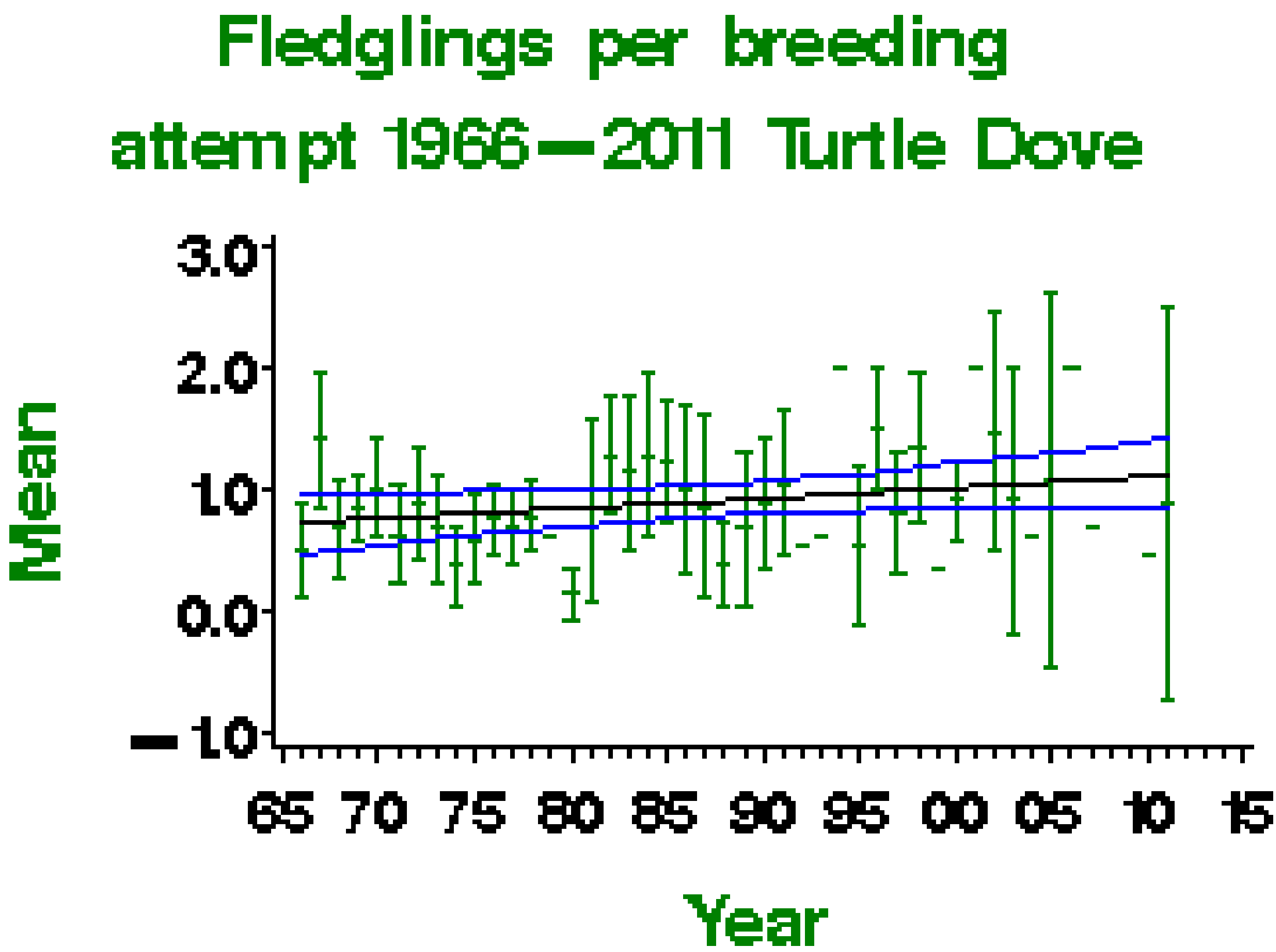


BBS UK graph

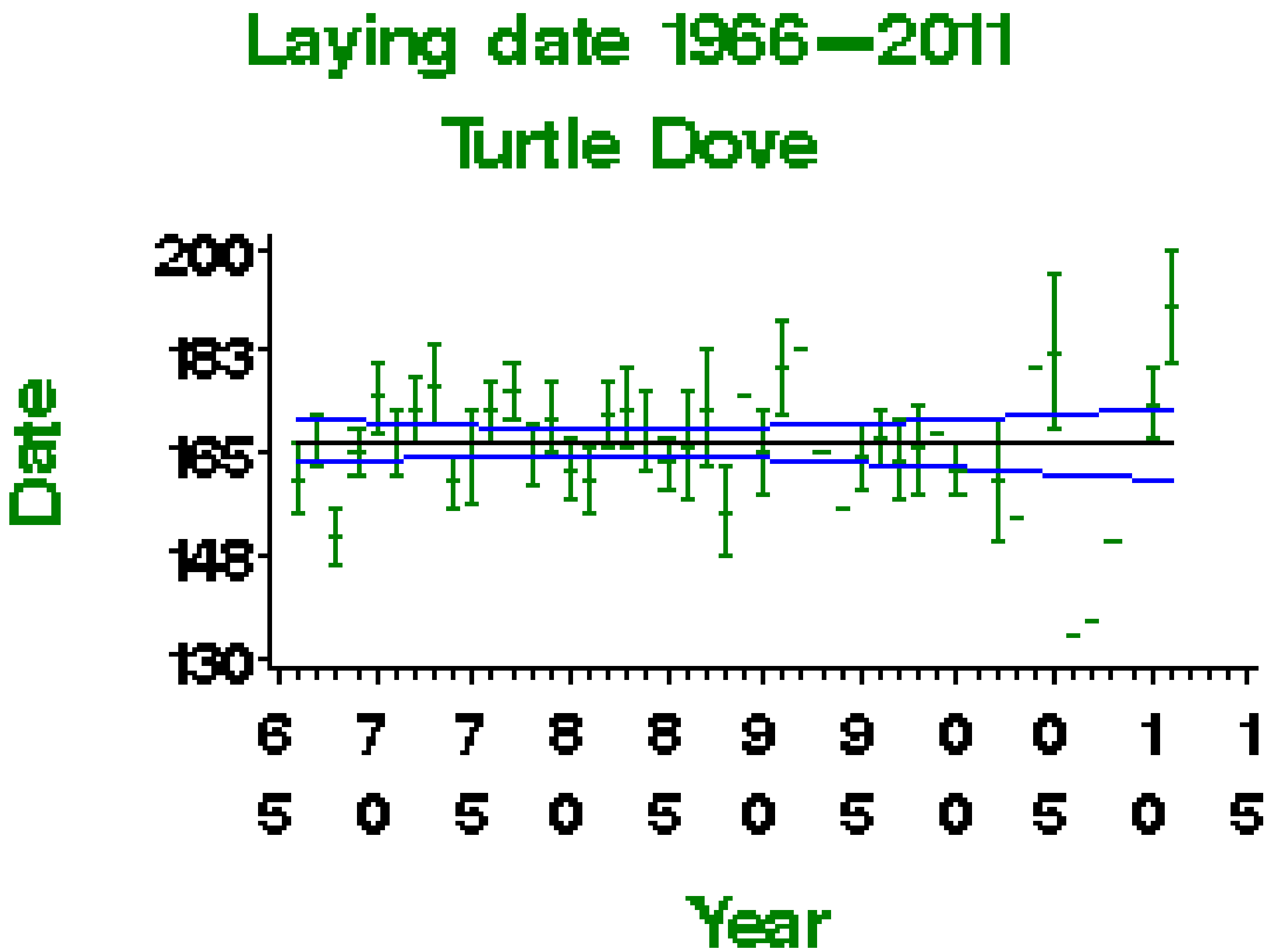


BBS England graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

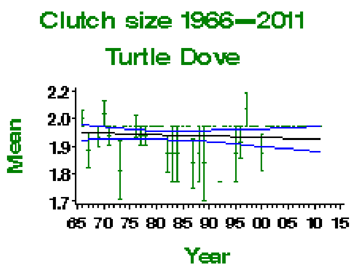


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

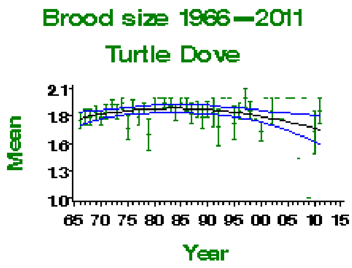
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	11	None					
Fledglings per breeding attempt	42	1968-2010	11	None					
Clutch size	42	1968-2010	11	None					Small sample
Brood size	42	1968-2010	15	Curvilinear	1.82 chicks	1.69 chicks	-6.9%		Small sample
Nest failure rate at egg stage	42	1968-2010	15	None					Small sample
Nest failure rate at chick stage	42	1968-2010	11	None					Small sample
Laying date	42	1968-2010	12	None			0 days		Small sample

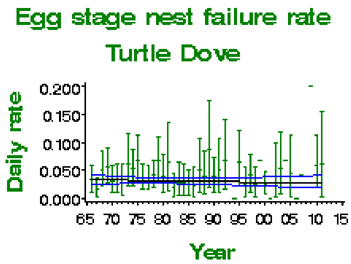
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



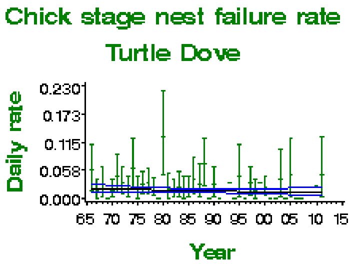
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

Causes of change

There is good evidence to support the hypothesis that the primary demographic driver of Turtle Dove declines is a shortened breeding period, which has reduced the number of nesting attempts. This is thought to be driven by reduced food availability due to increased herbicide use, although any analyses to test this directly are lacking. Note, however, that data do not permit analyses of variation in annual survival rates, but mortality both on the wintering grounds (due to habitat deterioration) and on migration (particularly through hunting) could be important.

Change factor	Primary driver	Secondary driver
Demographic	Reduced breeding success	
Ecological	Agricultural intensification	

Further information on causes of change

A four-year intensive field study in East Anglia provided good evidence that the role of breeding productivity in the decline of Turtle Doves is likely to be through a reduction in the average number of nesting attempts per pair (Browne & Aebischer 2005). Browne & Aebischer (2003, 2004, 2005) concluded that Turtle Doves today have a substantially earlier close to the breeding season and consequently produce fewer clutches and young per pair than they did in the 1960s. Reduced food availability due to increased herbicide use and efficacy may make birds more likely to cease breeding earlier than during the 1960s and reduce their number of nesting attempts (Browne & Aebischer 2001, 2002), although this was not specifically tested. Browne & Aebischer (2003) state that it may be a change in phenology of Turtle Doves and their food species which has resulted in reduced availability of food supplies, although they do not support this with any specific analyses of these two factors. Loss of quality and quantity of breeding habitat are also thought to contribute to declines. Browne et al. (2004) used long-term CBC data to provide good evidence that breeding density fell in proportion to loss of nesting, rather than feeding, habitat and that changes in Turtle Dove density were positively related to changes in the amount of hedgerow and woodland edge. Dunn & Morris (2012) suggest however that, although established scrub and large hedgerows were important in retaining Turtle Dove territories, it may be foraging habitat that is limiting their distribution.

There is good evidence to suggest that the population decline experienced by Turtle Doves breeding in Britain is not due to lower success of individual nesting attempts. Analysis of nest record cards and ringing data for farmland Turtle Doves shows a non-significant increase in productivity per nesting attempt while annual survival has fallen (Siriwardena et al. 2000a, 2000b, Browne et al. 2005) so this may have also contributed to the decline. The demographic trends shown here support the view that nesting success per attempt is not the main driver of population change, with only a slight decrease in brood size being reported (see above).

Turtle Dove is a quarry species in many European countries and hunting during migration has been cited as another possible cause of the UK decline, although there is little evidence to support this (Browne & Aebischer 2004). Ring-recovery sample sizes are small and there is only weak evidence suggesting a decrease in annual survival (Siriwardena et al. 2000b). Nevertheless, survival could also have been negatively affected by a reduction in the quality of wintering habitat: this is thought to have contributed to the decline (Marchant et al. 1990) and one recent study has demonstrated a positive correlation between survival rate among breeding adults in France and food supply in West Africa, as measured by cereal production (Eraud et al. 2009). Further work on the ecology of Turtle Doves on their wintering grounds is needed to investigate the relevance of this result for UK birds.

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

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Ring-necked Parakeet

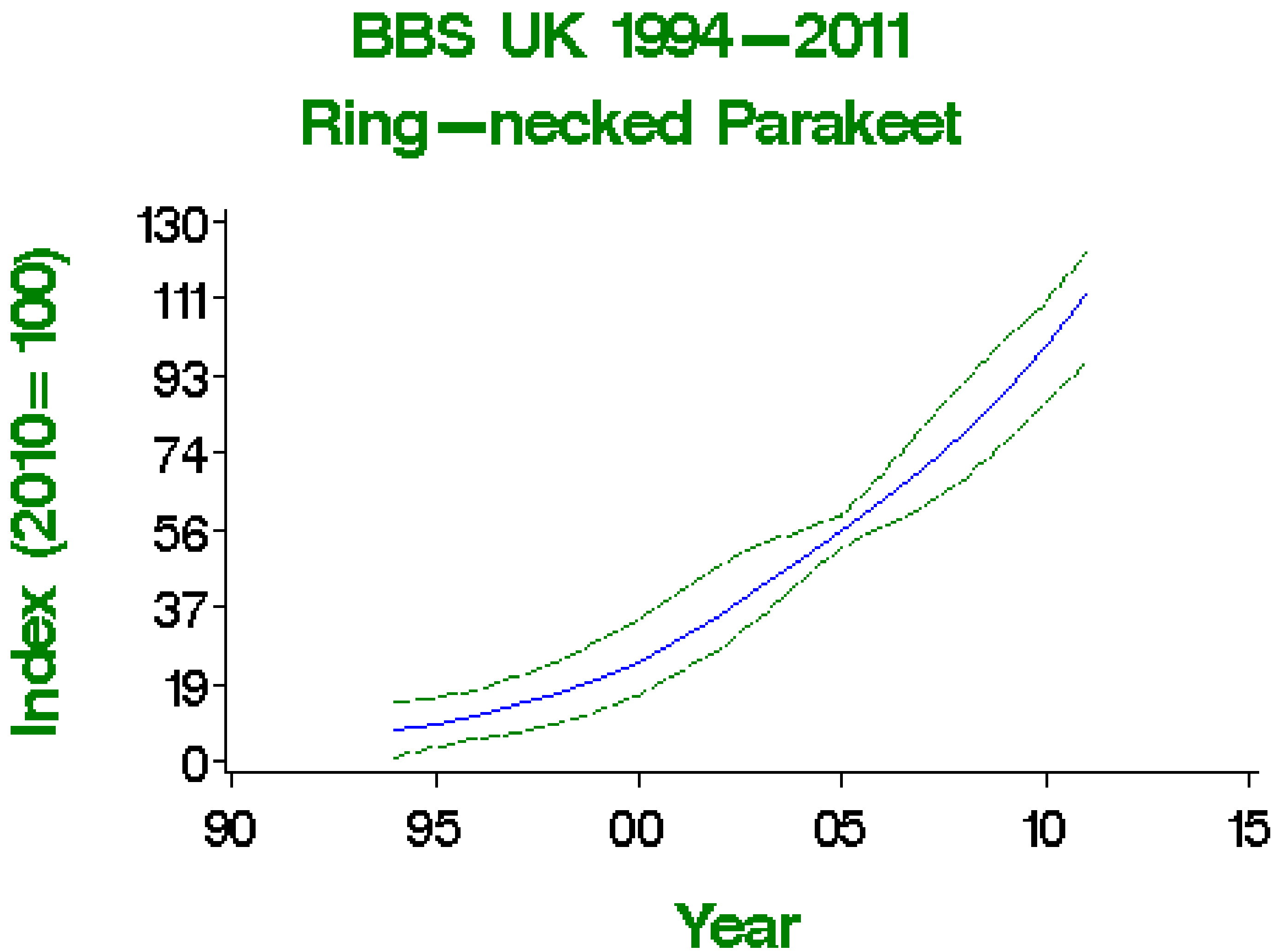
Psittacula krameri

Key facts

Conservation listings:	Europe: not evaluated (introduced) (BiE04) UK: not listed (introduced)
Long-term trend:	England: rapid increase
Population size:	8,600 pairs in 2012 (APEP13: H Peck pers. comm., www.projectparakeet.co.uk)

Status summary

Following escapes and releases over many decades, this African and Asian parrot began breeding annually in the UK in 1969. Substantial but highly localised self-sustaining populations of this species have since built up, with the two largest being in the southern part of Greater London and in the Isle of Thanet, east Kent. Population modelling has revealed that populations in Greater London have increased by approximately 30% per year, and those in Thanet by 15% per year, but that the range has expanded by only 0.4 km per year in the Greater London area and hardly at all in Thanet (Butler 2003). National BBS data indicate a ninefold increase since 1995. There have been recent post-breeding estimates of more than 30,000 birds at large in the UK (Holling & RBBP 2011a). The species has already been reported causing economic damage to crops, as has occurred elsewhere in its native and introduced range (Butler 2003). A recent study in Belgium has identified negative effects on breeding Strubbe & Matthysen 2007, 2009, Strubbe et al. 2010). No such effects have yet been detectable in Britain, however (Newsonet al. 2011).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

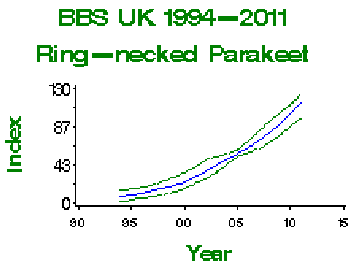
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	15	1995-2010	55	1012	456	3538		
	10	2000-2010	78	318	131	616		
	5	2005-2010	101	80	48	112		

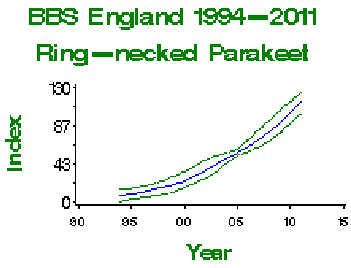
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS England	15	1995-2010	55	1012	469	4355		
	10	2000-2010	78	319	140	662		
	5	2005-2010	101	80	55	110		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



BBS UK graph



BBS England graph

Demographic trends

Productivity and survival trends for this species are not currently produced by BTO

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Cuckoo

Cuculus canorus

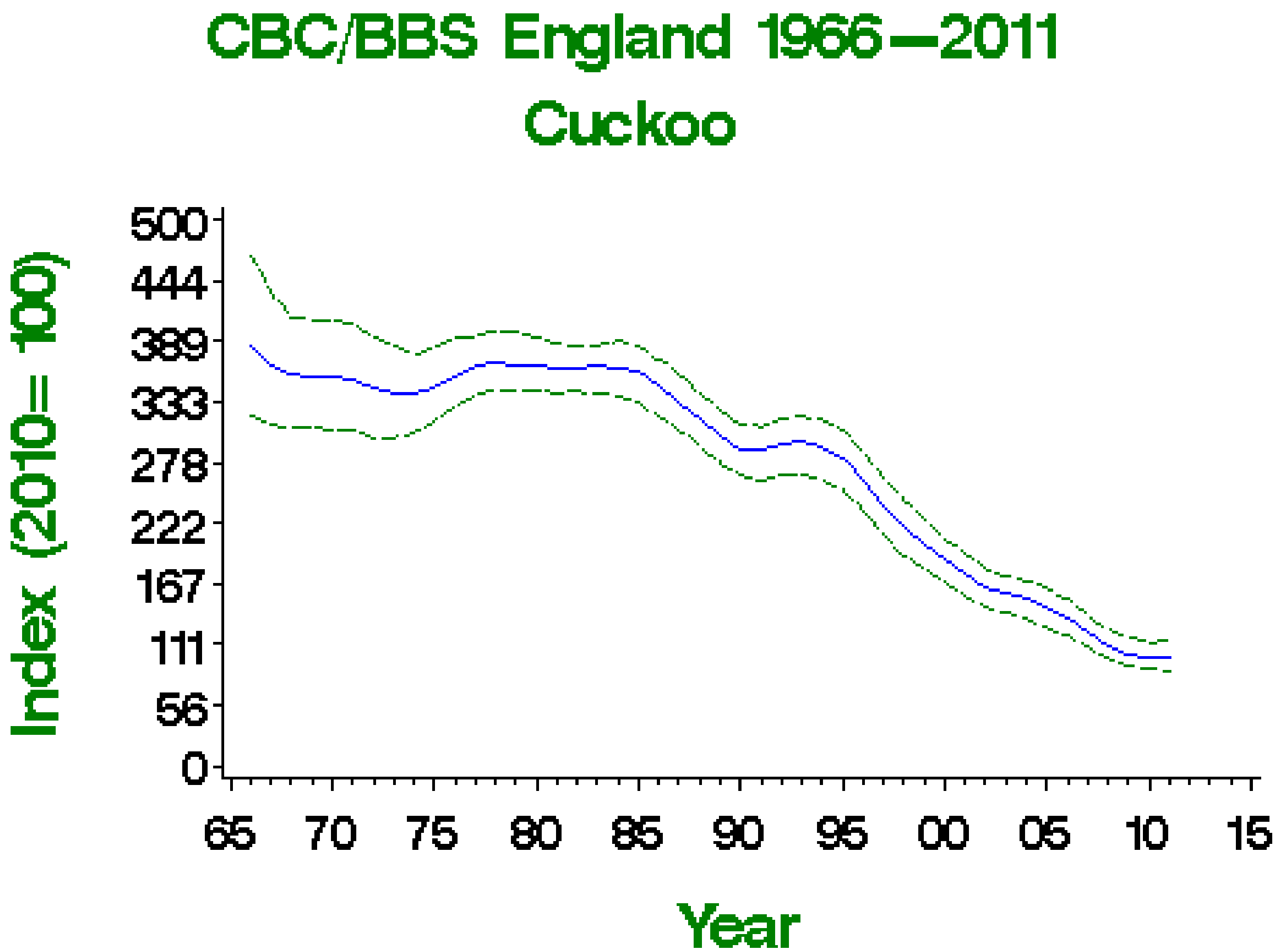
Key facts

Conservation listings:	Europe: no SPEC category (favourable conservation status in Europe, not concentrated in Europe) (BiE04) UK: red (BoCC3) UK Biodiversity Action Plan: priority species
Long-term trend:	England: rapid decline
Population size:	16,000 (9,000-24,000) pairs in 2009 (APEP13: distance sampling estimate for 2006 (Newson et al. 2008) updated using BBS trend)

Migrant status:	Long-distance migrant
Nesting habitat:	Host-specific
Primary breeding habitat:	Woodland
Secondary breeding habitat:	
Breeding diet:	Animal
Winter diet:	Animal

Status summary

The CBC/BBS trend shows Cuckoo abundance to have been in decline since the early 1980s. The species was moved in 2002 from the green to the amber list, and in the latest review met red-list criteria. The sensitivity of CBC to change in this species may have been relatively low, mainly because Cuckoo territories were typically larger than census plots (Marchant et al. 1990). BBS shows a continuing strong decline in England and Wales, but not in Scotland, where numbers appear to be stable. The BBS Newson et al. 2009). There has been widespread moderate decrease across Europe since 1980, but with little change since 1990 (PECBMS 2012a).



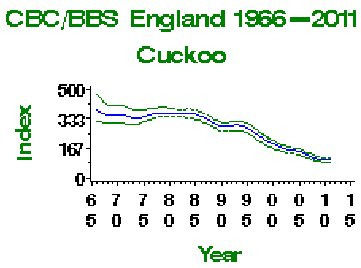
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

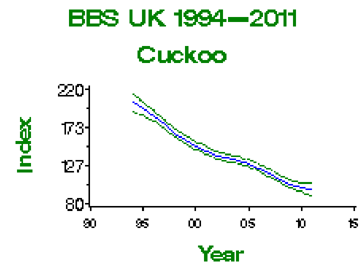
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	43	1967-2010	286	-73	-80	-62	>50	
	25	1985-2010	420	-72	-76	-68	>50	
	10	2000-2010	547	-47	-52	-43	>25	
	5	2005-2010	560	-31	-35	-27	>25	
BBS UK	15	1995-2010	726	-49	-53	-44	>25	
	10	2000-2010	698	-33	-39	-28	>25	
	5	2005-2010	727	-22	-28	-17		
BBS England	15	1995-2010	565	-63	-66	-61	>50	
	10	2000-2010	529	-45	-49	-40	>25	
	5	2005-2010	537	-28	-32	-24	>25	
BBS Scotland	15	1995-2010	74	-5	-23	15		
	10	2000-2010	75	-12	-27	4		
	5	2005-2010	88	-15	-28	0		
BBS Wales	15	1995-2010	56	-34	-49	-18	>25	
	10	2000-2010	57	-23	-38	-7		
	5	2005-2010	57	-8	-21	7		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

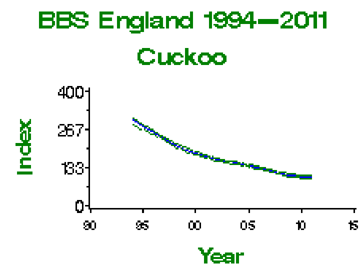
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



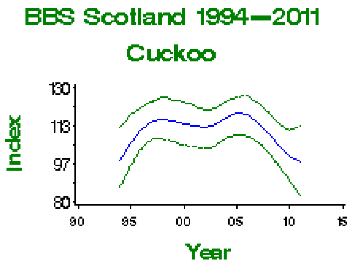
CBC/BBS England graph



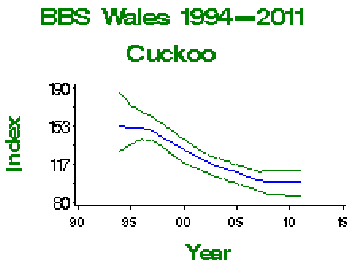
BBS UK graph



BBS England graph



BBS Scotland graph



BBS Wales graph

Demographic trends

Productivity and survival trends for this species are not currently produced by BTO

Causes of change

It is unclear as to what is the main driver of population decline in Cuckoos. Given the lack of demographic trends for this species it is not possible to identify a specific mechanism behind the declines.

Change factor	Primary driver	Secondary driver
Demographic	Unknown	
Ecological	Unknown	

Further information on causes of change

Cuckoo abundance may be related to their breeding success, which might in turn be determined by the abundance of breeding success of host species. Evidence from BBS data show strong variation in Cuckoo population trends between habitats, which may reflect regional differences in the main hosts and differing trends in Cuckoo breeding success among those host species (Newson et al. 2009). Douglas et al. (2010b) found a strong positive correlation between change in Cuckoo numbers and numbers of Meadow Pipit in the previous year, also based on BBS data, but this only accounted for 1% of the decline in Cuckoo populations so this is unlikely to be a primary driver. A study from the 1980s using Nest Record Scheme data also found changes in usage of some key host species (Brooke & Davies 1987) but the authors also thought that this was unlikely to be the main cause of population decline. There has perhaps been a disproportionate emphasis on the role of brood parasitism aspects in Cuckoo decline.

Another hypothesis for the decline of Cuckoos relates to phenological mismatch in the timing of host and Cuckoo breeding. There is evidence relating to climate-induced changes in phenology, although the extent to which this may be driving population declines is unclear. Douglas et al. (2010b) used BBS data and found that in recent decades, earlier breeding Dunnock nests have become less available to Cuckoos, whilst those of Reed Warblers more so. However, they suggested that changes in host phenology are likely to have had only a minimal impact on Cuckoo population trend (Douglas et al. 2010b). In Europe, other recent studies have suggested that climate change might disrupt the association between the life cycles of the Cuckoo and its short-distance migrant hosts and they state that this mismatch may contribute to the decline in Cuckoo (Saino et al. 2009, Moller et al. 2011). Thus, evidence at European scale at least is equivocal.

Given that the Cuckoo is a migrant, and the fact that many long-distance migrants have been found to be declining (Sanderson et al. 2006, Hewson & Noble 2009), factors operating on wintering grounds have been suggested as a possible primary driver of Cuckoo declines (Glue 2006, Payevsky 2006, Newson et al. 2009). However, little work has focused on this area to date. Decreased food supplies on the breeding grounds has also been suggested as a possible cause (Glue 2006), following the rapid declines of many British moth species (Conrad et al. 2006), important prey items in Cuckoo diet, but detailed research on this is lacking.

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Barn Owl

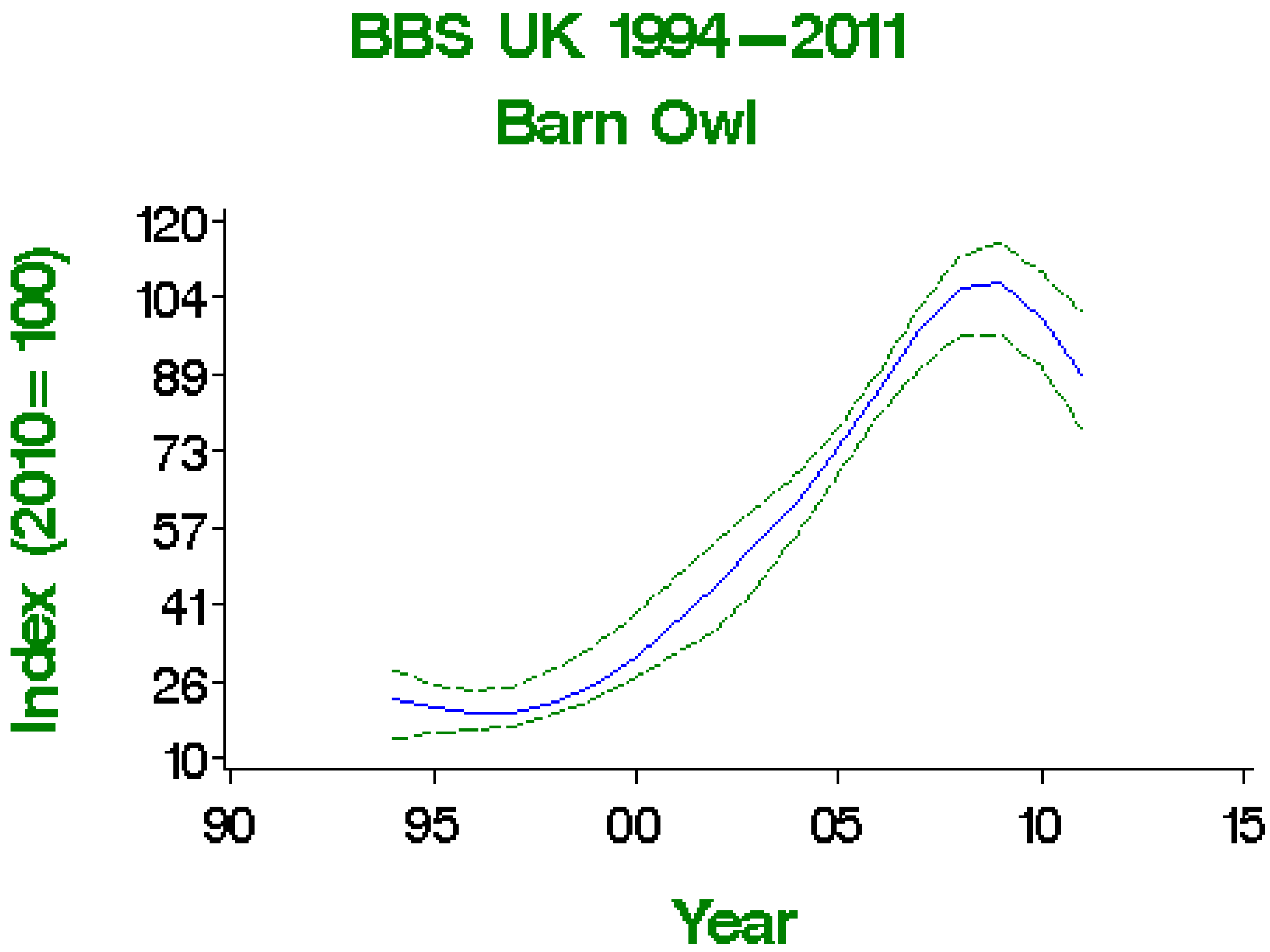
Tyto alba

Key facts

Conservation listings:	Europe: SPEC category 3 (declining) (BiE04) UK: amber (25-50% distribution decline) (BoCC3)
Long-term trend:	UK: probable decline
Population size:	4,000 (3,000-5,000) pairs in 1995-97 (APEP13: Toms et al. 2001)

Status summary

Distributional data provide good evidence for a decline in this species that lasted throughout the 20th century, although annual monitoring started only very recently. Productivity has tended to improve since the 1950s and 1960s, when Barn Owls appear to have been affected by organochlorine pesticides (Percival 1990). A national census during 1995-97, organised jointly by Hawk & Owl Trust and BTO, provided a replicable baseline population estimate (Toms et al. 2000, 2001; for more information, clickDadam et al. 2011). In earlier decades, the plight of such a charismatic and popular bird led to extensive releasing of captive-bred birds in well-meaning attempts at restocking: by 1992, when licensing became a requirement for such schemes, it was estimated that between 2,000 and 3,000 birds were being released annually by about 600 operators, although many birds died quickly and few would have joined the nesting population (Balmer et al. 2000). More recently, the erection of Barn Owl nest boxes, already numbering c. 25,000 by the mid 1990s, has enabled the species to occupy areas (notably the Fens) that were previously devoid of nesting sites, and may have been a factor in improving nesting success. Numbers of Barn Owls recorded via BBS have increased since 1995 and reached a peak around 2009. As BBS is a diurnal survey, the detectability of primarily nocturnal species is low and could be influenced quite markedly by changes in behaviour: thus the trends should be interpreted with extra care. The number of nest records for Barn Owl has also increased rapidly over the same period, strengthening the evidence that a national population increase has indeed occurred since Project Barn Owl in 1995-97. There is likely to be some regional variation in population trends, however. RBBP provide a county breakdown of 2005 nesting totals Holling & RBBP 2008).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

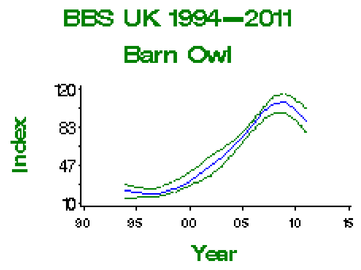
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment

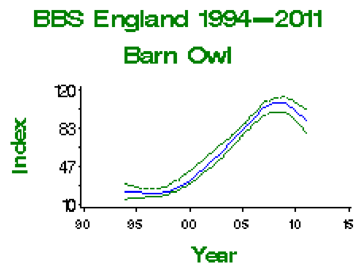
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	15	1995-2010	45	390	263	619		
	10	2000-2010	61	227	121	339		
	5	2005-2010	80	36	15	62		
BBS England	15	1995-2010	43	369	257	558		
	10	2000-2010	58	210	116	264		
	5	2005-2010	77	23	9	41		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB

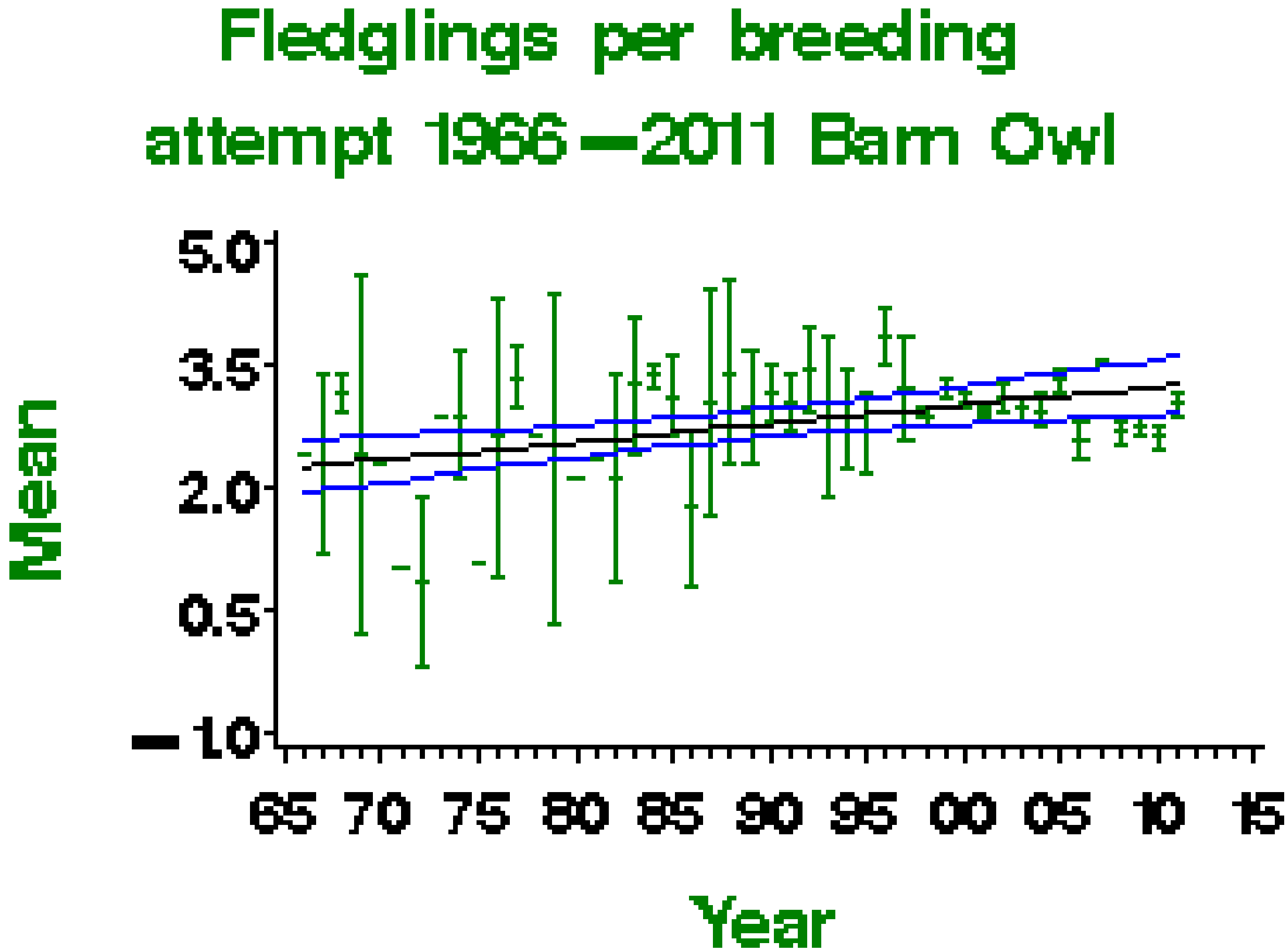


BBS UK graph

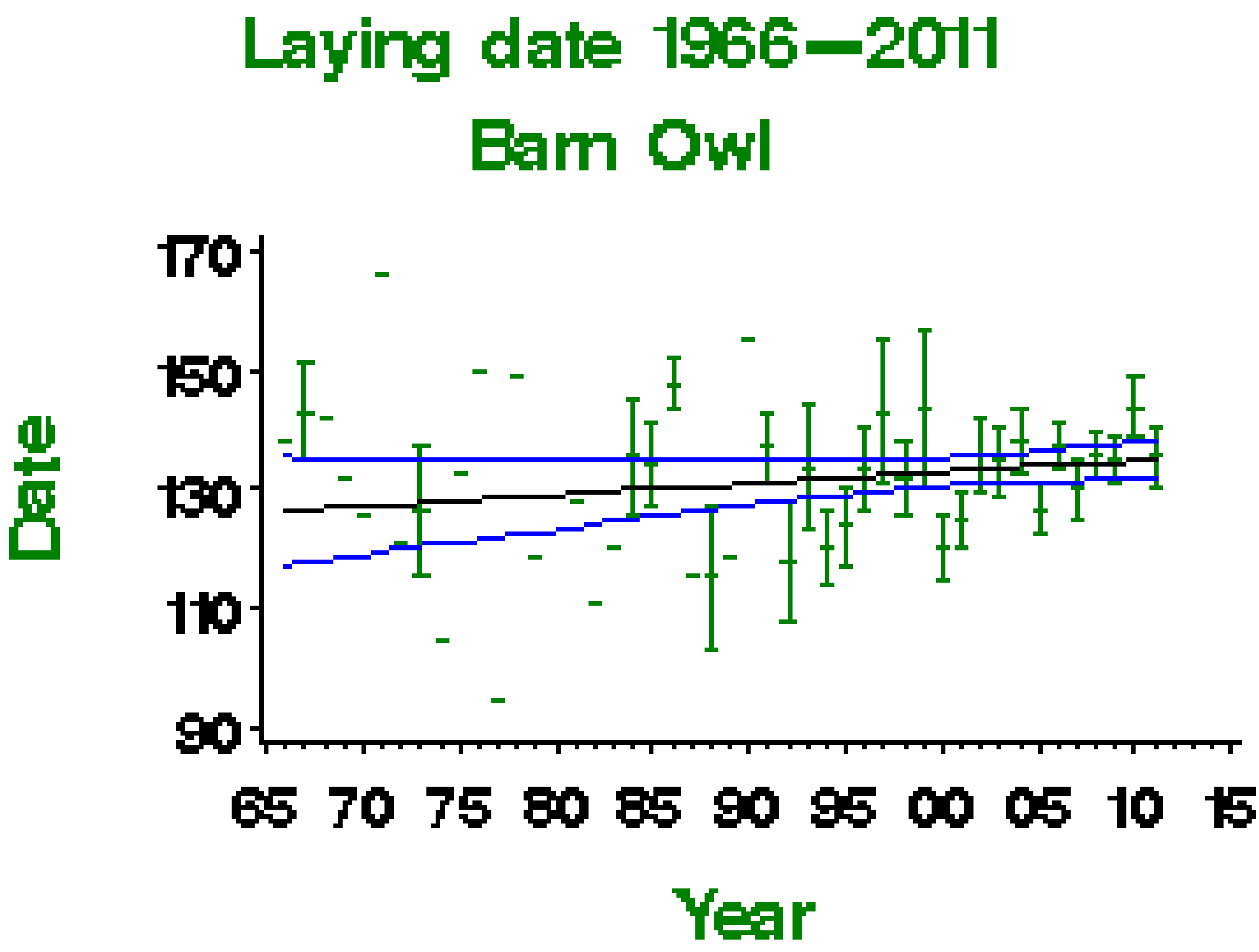


BBS England graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

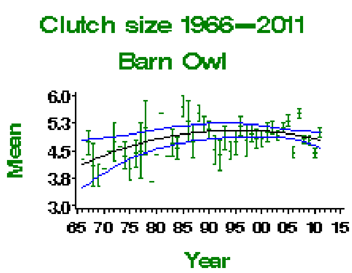


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

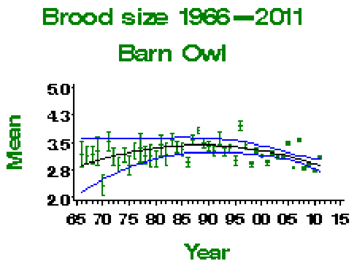
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	28	Linear increase	2.32 fledglings	3.24 fledglings	40.1%		
Clutch size	42	1968-2010	41	Curvilinear	4.25 eggs	4.83 eggs	13.6%		
Brood size	42	1968-2010	328	Curvilinear	2.96 chicks	2.92 chicks	-1.2%		
Nest failure rate at egg stage	42	1968-2010	28	Linear decline	0.80% nests/day	0.05% nests/day	-93.8%		Small sample
Nest failure rate at chick stage	42	1968-2010	128	Linear decline	0.20% nests/day	0.02% nests/day	-90.0%		
Laying date	42	1968-2010	17	None			0 days		Small sample

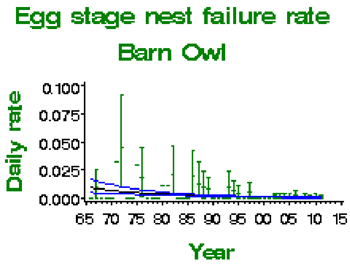
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



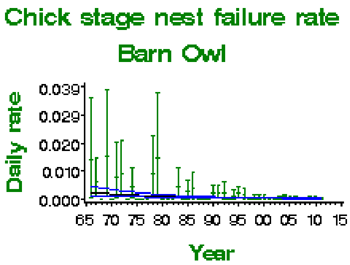
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



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Little Owl

Athene noctua

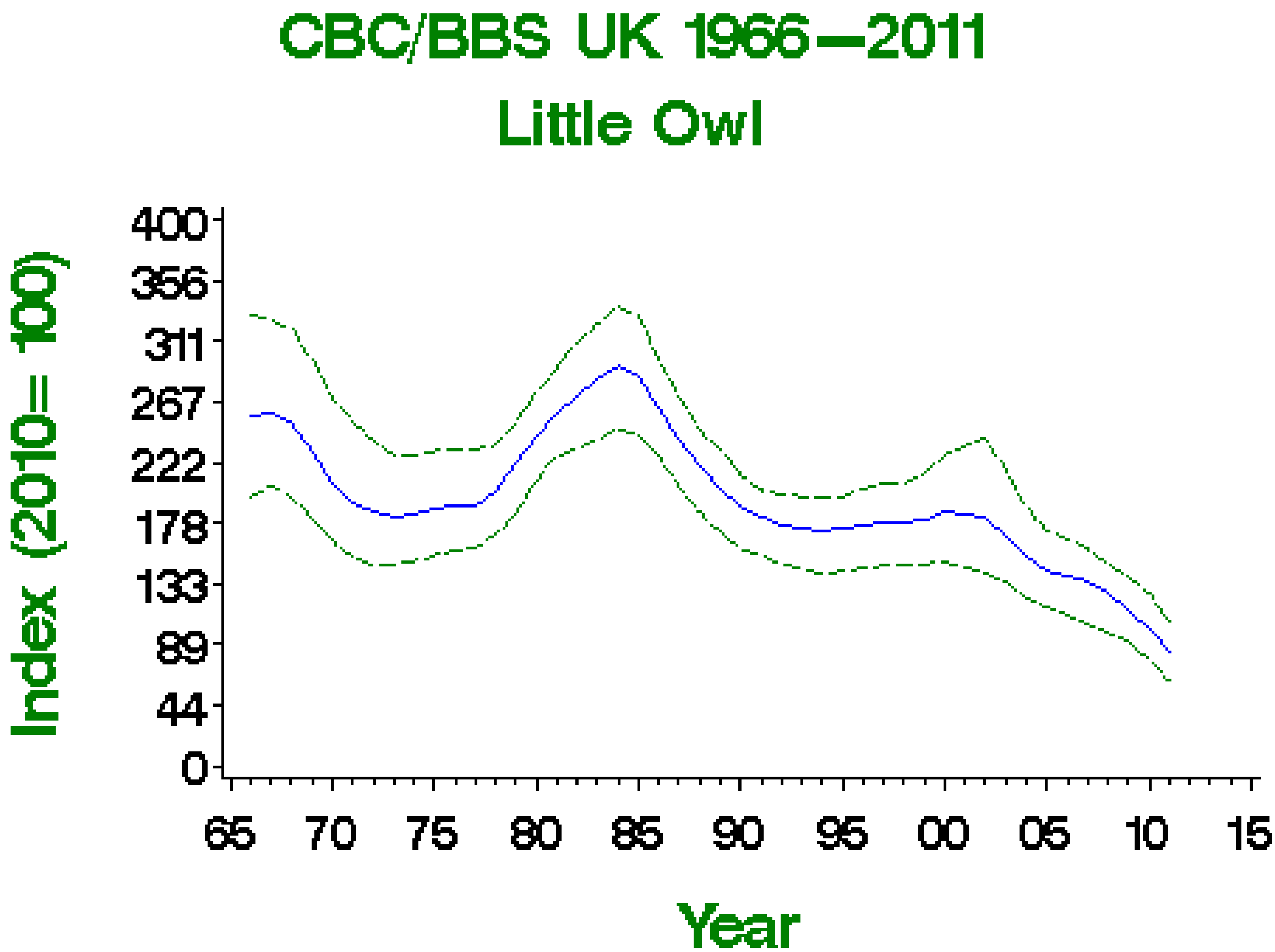
Key facts

Conservation listings:	Europe: SPEC category 3 (declining) (BiE04) UK: not listed (introduced)
Long-term trend:	UK: rapid decline England: moderate decline
Population size:	5,700 (3,700-7,700) pairs in 2009 (distance sampling estimate for 2006 (Newson et al. 2008) updated using BBS trend)

Migrant status:	Resident
Nesting habitat:	Cavity nester
Primary breeding habitat:	Farmland
Secondary breeding habitat:	
Breeding diet:	Animal
Winter diet:	Animal

Status summary

The CBC/BBS trend for Little Owl in the UK shows very wide variation, but a downturn in recent seasons suggests that a moderate long-term decline probably lies behind the observed fluctuations. Trends are poorly known, however, because the species has large breeding territories and, being largely inactive during the day, is difficult to detect except by dedicated surveys. A figure of c. 7,000 pairs from the BTO/Hawk & Owl Trust's Toms et al. 2000) was the first replicable population estimate for Little Owls in the UK.



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	59	-61	-76	-42	>50	
	25	1985-2010	82	-65	-75	-51	>50	
	10	2000-2010	110	-46	-55	-36	>25	
	5	2005-2010	113	-31	-40	-17	>25	
CBC/BBS England	43	1967-2010	57	-55	-71	-30	>50	
	25	1985-2010	79	-59	-71	-48	>50	
	10	2000-2010	107	-45	-53	-34	>25	
	5	2005-2010	110	-31	-41	-17	>25	
BBS UK	15	1995-2010	101	-40	-51	-28	>25	
	10	2000-2010	106	-45	-54	-34	>25	
	5	2005-2010	110	-32	-41	-21	>25	
BBS England	15	1995-2010	98	-38	-48	-24	>25	
	10	2000-2010	103	-43	-52	-32	>25	
	5	2005-2010	107	-31	-39	-19	>25	

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

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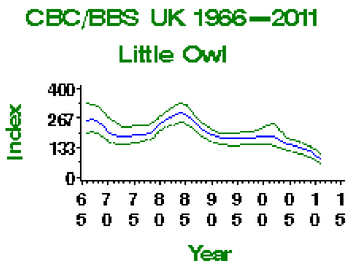
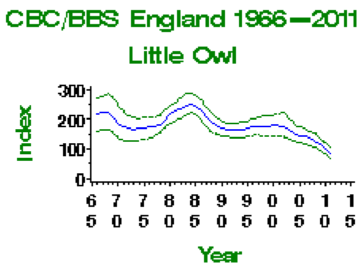
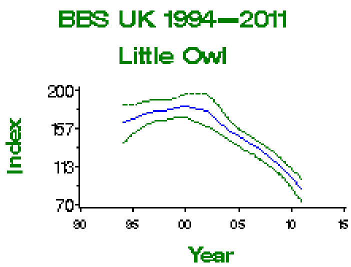


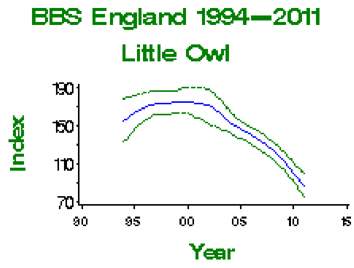
CBC/BBS UK graph



CBC/BBS England graph

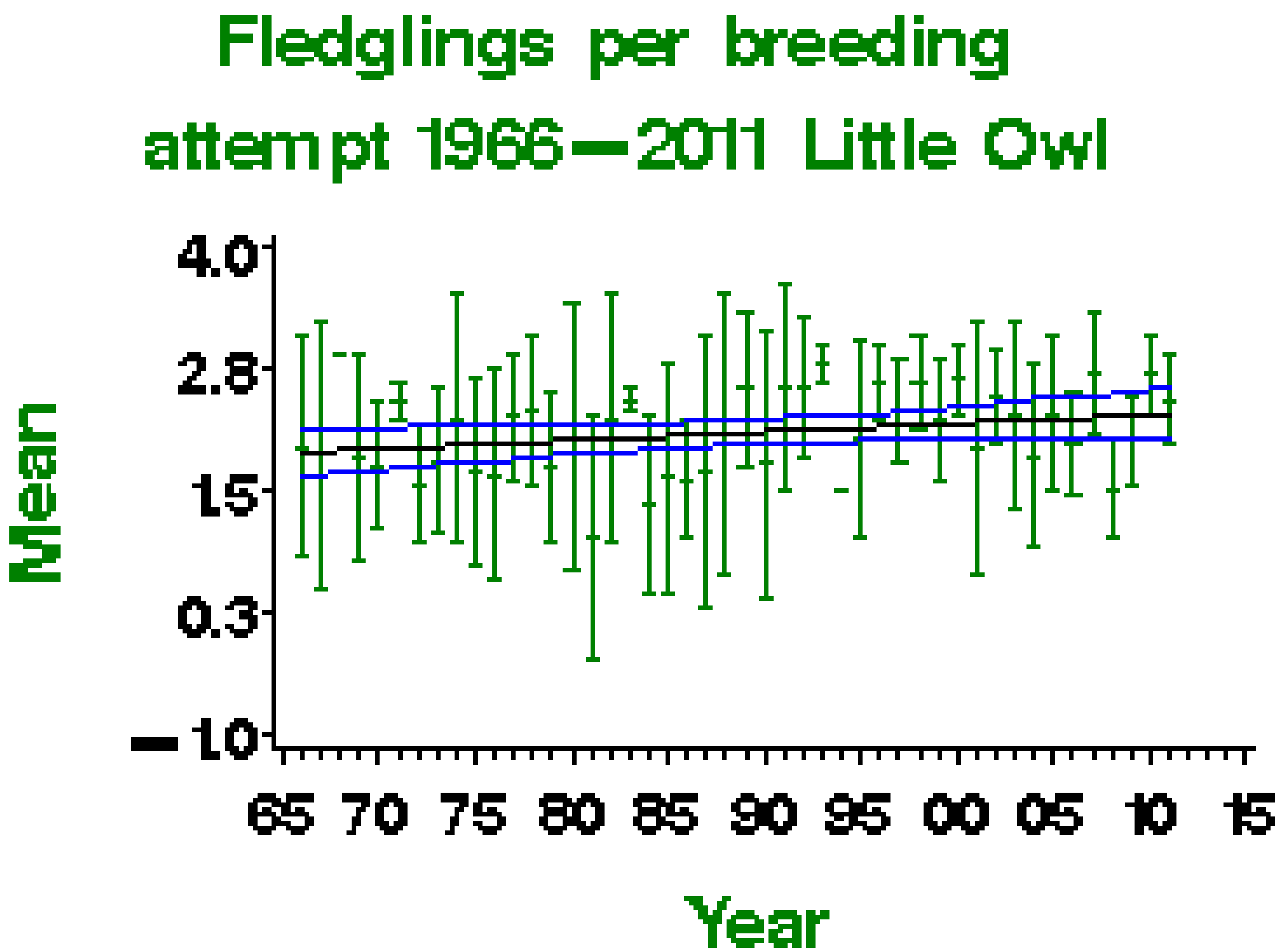


BBS UK graph

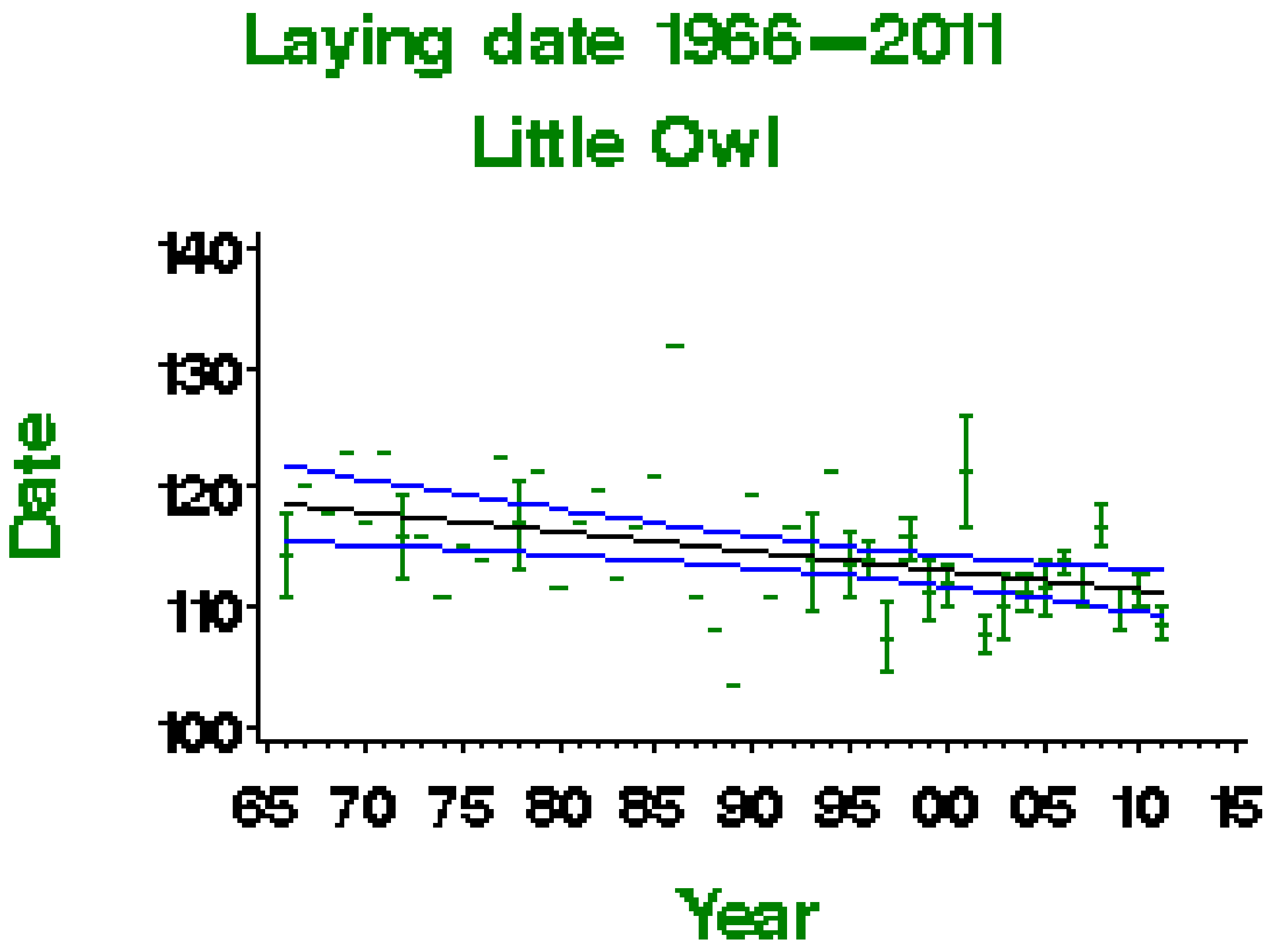


BBS England graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

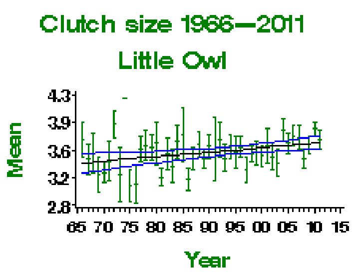


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

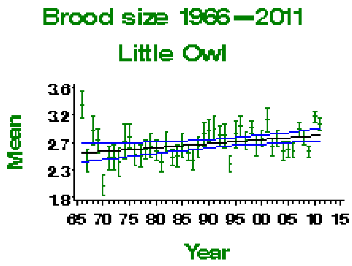
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	18	None					
Clutch size	42	1968-2010	22	Linear increase	3.38 eggs	3.64 eggs	7.6%		Small sample
Brood size	42	1968-2010	46	Linear increase	2.54 chicks	2.80 chicks	10.6%		
Nest failure rate at egg stage	42	1968-2010	18	None					Small sample
Nest failure rate at chick stage	42	1968-2010	22	None					Small sample

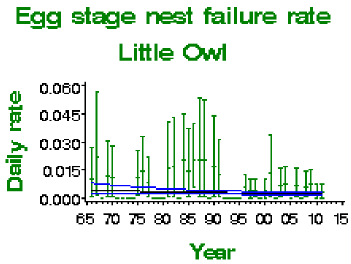
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



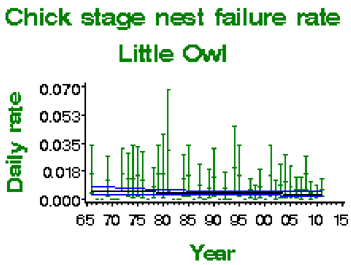
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



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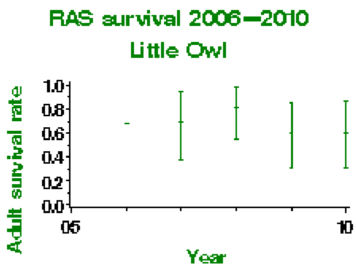

Proportion of adult birds surviving to following year - error bars represent 95% confidence limits

Causes of change

There is little evidence available from the UK but studies from Europe suggest that the main demographic driver of declines in Little Owl is changes in juvenile survival. Circumstantial evidence suggests that this may be due to loss of habitat and changes in farming practices.

Change factor	Primary driver	Secondary driver
Demographic	Decreased juvenile survival	
Ecological	Agricultural intensification	

Further information on causes of change

No trends are evident in the number of fledglings per breeding attempt, but this is based on a very small sample as few nest records are available. Clutch size has shown a linear increase, but no trends were apparent in brood size or nest failure rates (see above). There is very little evidence available from the UK regarding causes of the population decline. However, evidence from Europe suggests that population changes are driven mainly by changes in survival. Le Gouar et al. (2011) analysed 35 years of ringing data from the Netherlands and found that juvenile survival rates decreased with time and that years when the population declined were associated with low juvenile survival. More than 60% of the variation in juvenile survival was explained by the increase in road traffic intensity or in average spring temperature. However, they state that these correlations reflect a gradual decrease in juvenile survival coinciding with long-term global change, rather than direct causal effects. The regular occurrence of years with poor adult survival (dry, cold years) was also important. In north-eastern France, Letty et al. (2001) also found that population dynamics were highly sensitive to adult and first-year survival and, in Switzerland and Southern Germany, Schaub et al. (2006) reported that variation of adult survival contributed most to variation of population growth rate while variation in fecundity contributed least. Thus, evidence from Europe at least suggests that changes in populations of Little Owl are largely due to changes outside of the breeding season (although note that survival can also be affected by breeding-season conditions).

However, in Denmark, Thorup et al. (2010) found, in a declining population, that first-year annual survival rates were much lower than values previously reported, but also that the mean number of fledglings per pair had declined. Measures of reproductive success were higher closer to important foraging habitats and were positively correlated with the amount of seasonally changing land cover (mostly farmland) around nests, as well as temperatures before and during the breeding season. Experimental food supplementation to breeding pairs increased the proportion of eggs that produced fledged chicks, suggesting that the main reason for the ongoing population decline is reduced productivity induced by energetic constraints after egg-laying.

In terms of ecological drivers, in Poland, there is anecdotal evidence that changes in the agricultural landscape associated with disappearance of traditional farming and management of grassland habitats were the main factors in the long-term population decline (Salek & Schropfer 2008). Evidence from Spain has also suggested that habitat loss has played a role in population declines, due to increasing urbanisation (Martinez & Zuberogoitia 2004) and in Denmark the extent of contraction of Little Owl distribution varied across the country and local disappearance was associated with reduced areas of agricultural land (Thorup et al. 2010). In Poland, Zmihorski et al. (2006) concluded that the reduction in nesting sites and decreased food availability were the potential factors of the Little Owl decline, although this evidence was circumstantial. There is little evidence relating to the UK population and the drivers in Europe may not necessarily be the same here.

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Tawny Owl

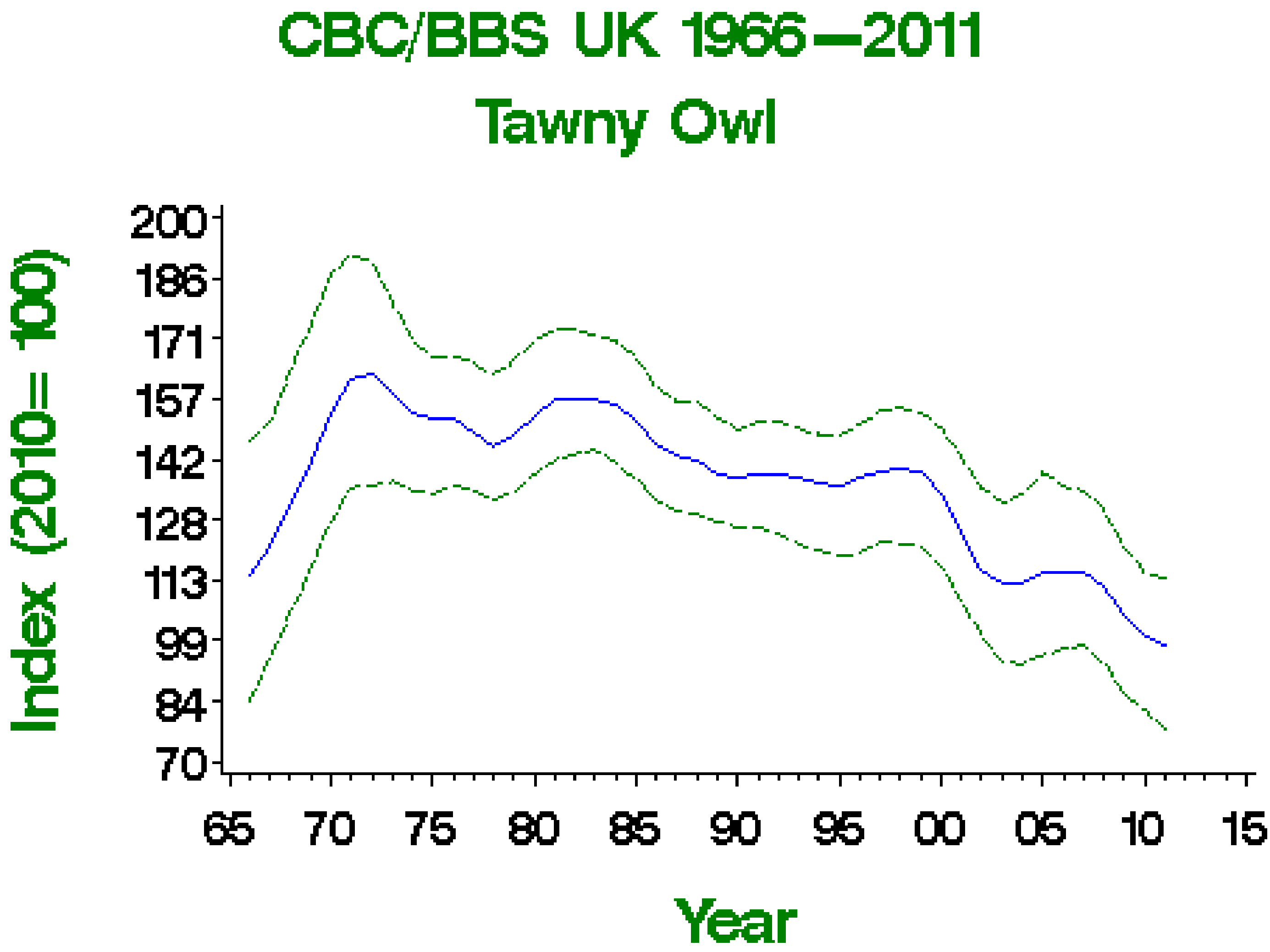
Strix aluco

Key facts

Conservation listings:	Europe: no SPEC category (concentrated in Europe, conservation status favourable) (BiE04) UK: green (BoCC3)
Long-term trend:	UK, England: shallow decline
Population size:	50,000 pairs in 2005 (APEP13: Freeman et al. 2007a)

Status summary

As a nocturnal species, Tawny Owl is covered relatively poorly by the BTO's monitoring schemes. The pattern shown by CBC/BBS is a relatively stable one, however, in keeping with the longevity, sedentary behaviour, and slow breeding rate of this species. There has been a shallow downward trend in the index since the early 1970s. It may be relevant to this possible long-term decline that Gibbons et al. (1993) found evidence for a contraction of the species' UK range between the two atlas periods. The substantial improvements in nest success during the c.29-day egg stage could be linked to the declining impact of organochlorine pesticides, which were banned in the early 1960s. The numbers of fledglings per breeding attempt have increased steeply. Special post-breeding surveys of this species were conducted in autumn 2005 (Percival 1990).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

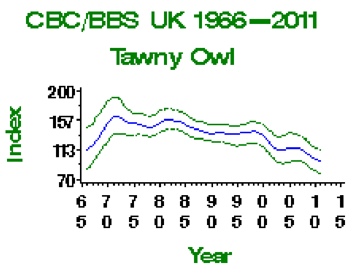
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	79	-17	-45	21		
	25	1985-2010	93	-34	-50	-18	>25	
	10	2000-2010	98	-25	-38	-8	>25	
	5	2005-2010	106	-13	-31	4		

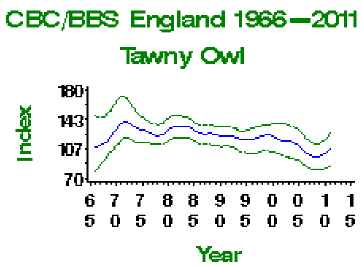
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	43	1967-2010	67	-9	-43	35		
	25	1985-2010	80	-23	-40	-3		
	10	2000-2010	85	-18	-31	0		
	5	2005-2010	91	-9	-25	8		
BBS UK	15	1995-2010	89	-23	-37	-7		Nocturnal species
	10	2000-2010	92	-23	-36	-6		Nocturnal species
	5	2005-2010	102	-12	-25	1		Nocturnal species
BBS England	15	1995-2010	76	-14	-32	8		Nocturnal species
	10	2000-2010	80	-17	-35	-3		Nocturnal species
	5	2005-2010	88	-8	-24	4		Nocturnal species

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

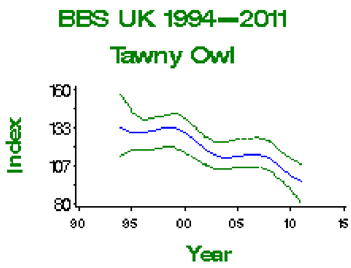
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



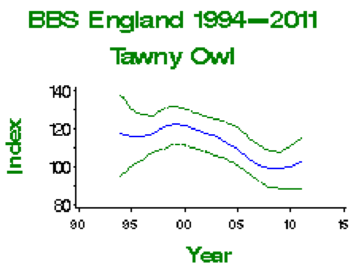
CBC/BBS UK graph



CBC/BBS England graph

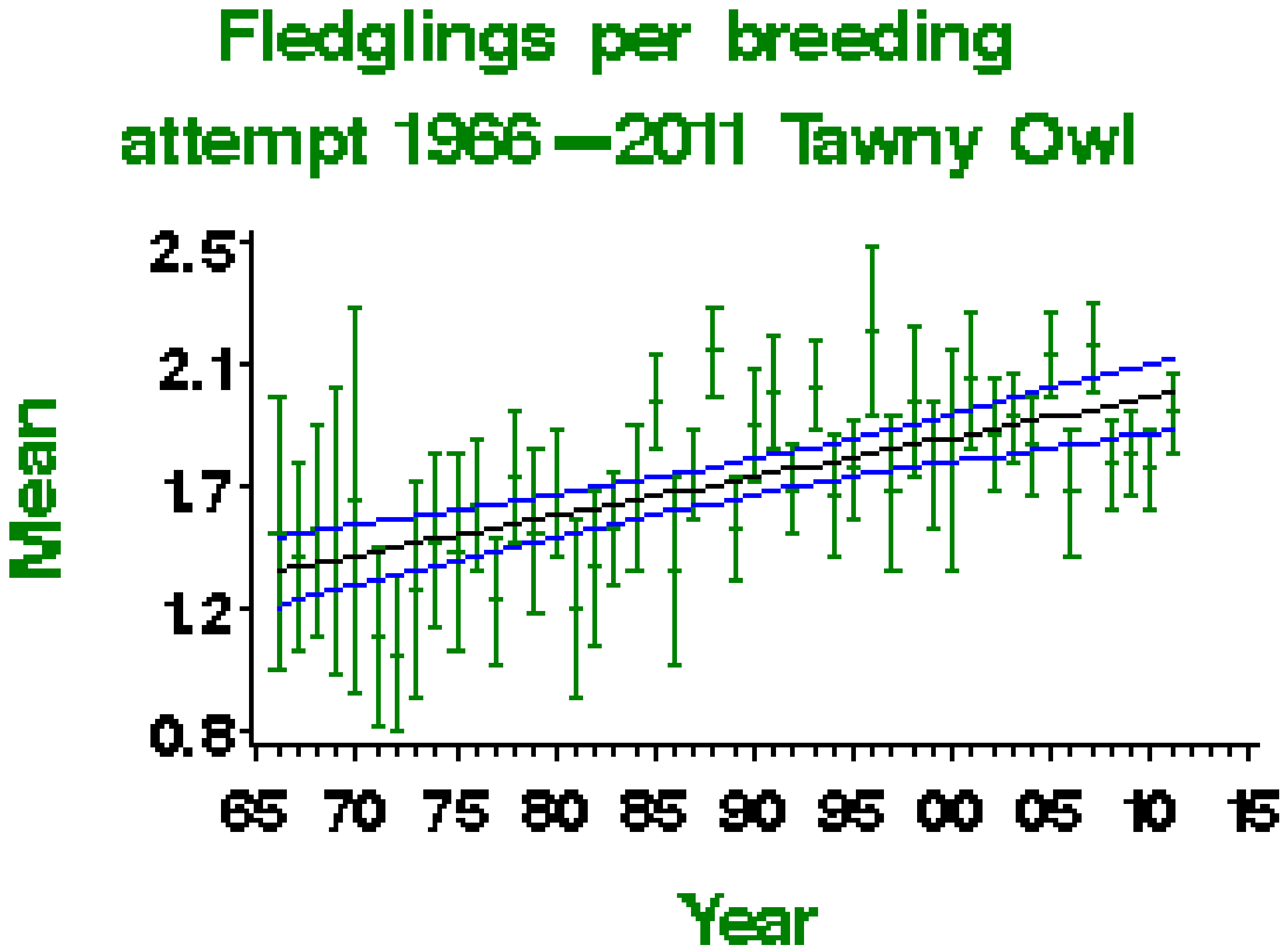


BBS UK graph

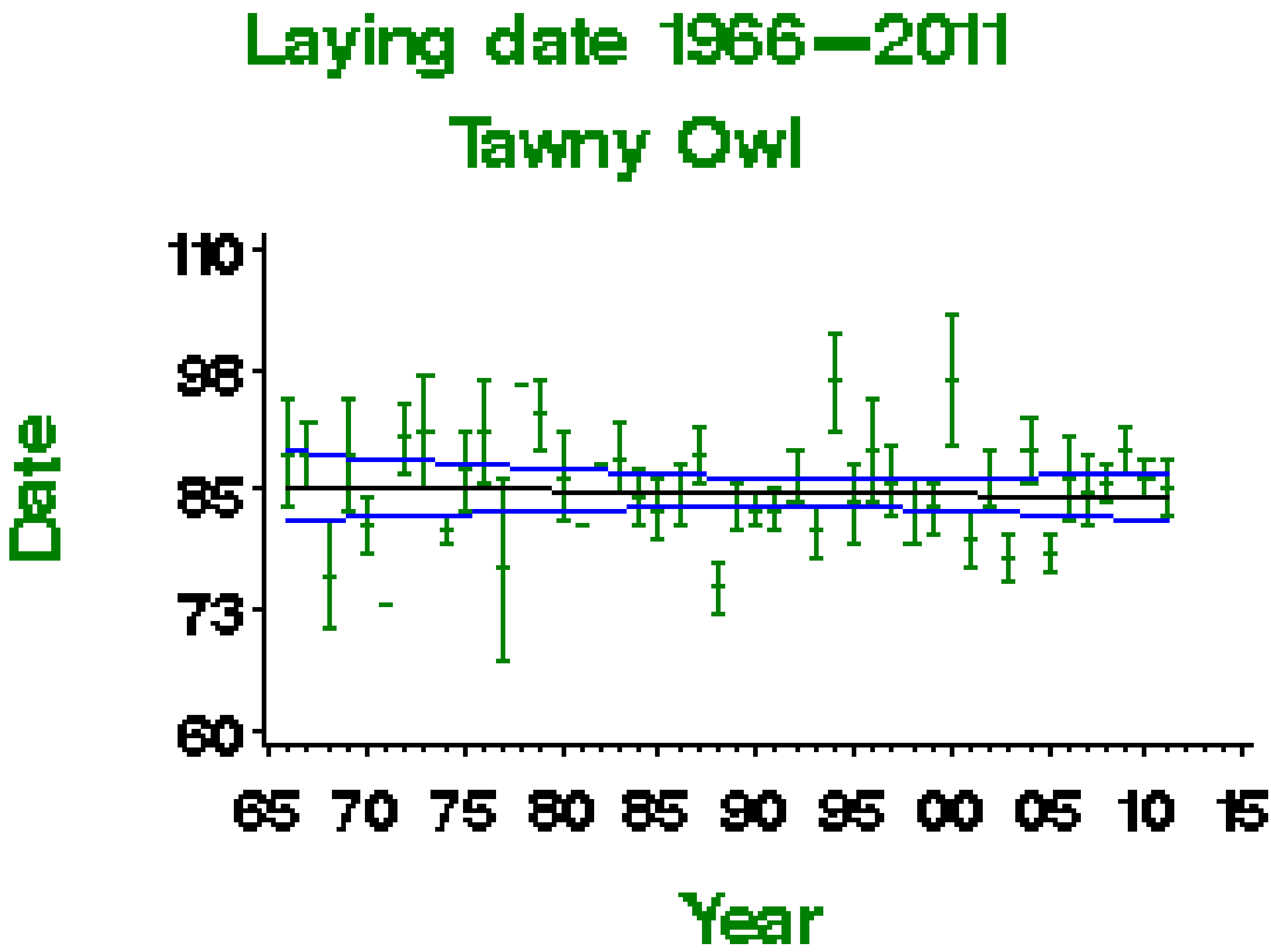


BBS England graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

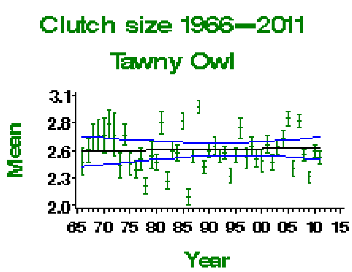


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

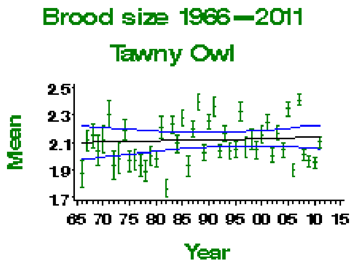
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	59	Linear increase	1.39 fledglings	1.96 fledglings	41.5%		
Clutch size	42	1968-2010	89	None					
Brood size	42	1968-2010	171	None					
Nest failure rate at egg stage	42	1968-2010	59	Curvilinear	1.05% nests/day	0.24% nests/day	-77.1%		
Nest failure rate at chick stage	42	1968-2010	91	Curvilinear	0.34% nests/day	0.09% nests/day	-73.5%		
Laying date	42	1968-2010	17	None			0 days		Small sample

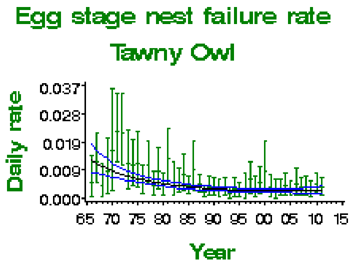
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



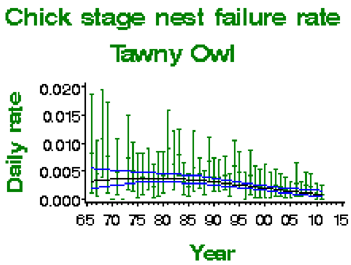
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

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This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

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Nightjar

Caprimulgus europaeus

Key facts

Conservation listings:	Europe: SPEC category 2 (declining) (BiE04) UK: red (>50% distribution decline) (BoCC3) UK Biodiversity Action Plan: click here, priority species
Long-term trend:	UK: uncertain
Population size:	4,600 (3,700-5,500) males in 2004 (APEP13: Conway et al. 2007)

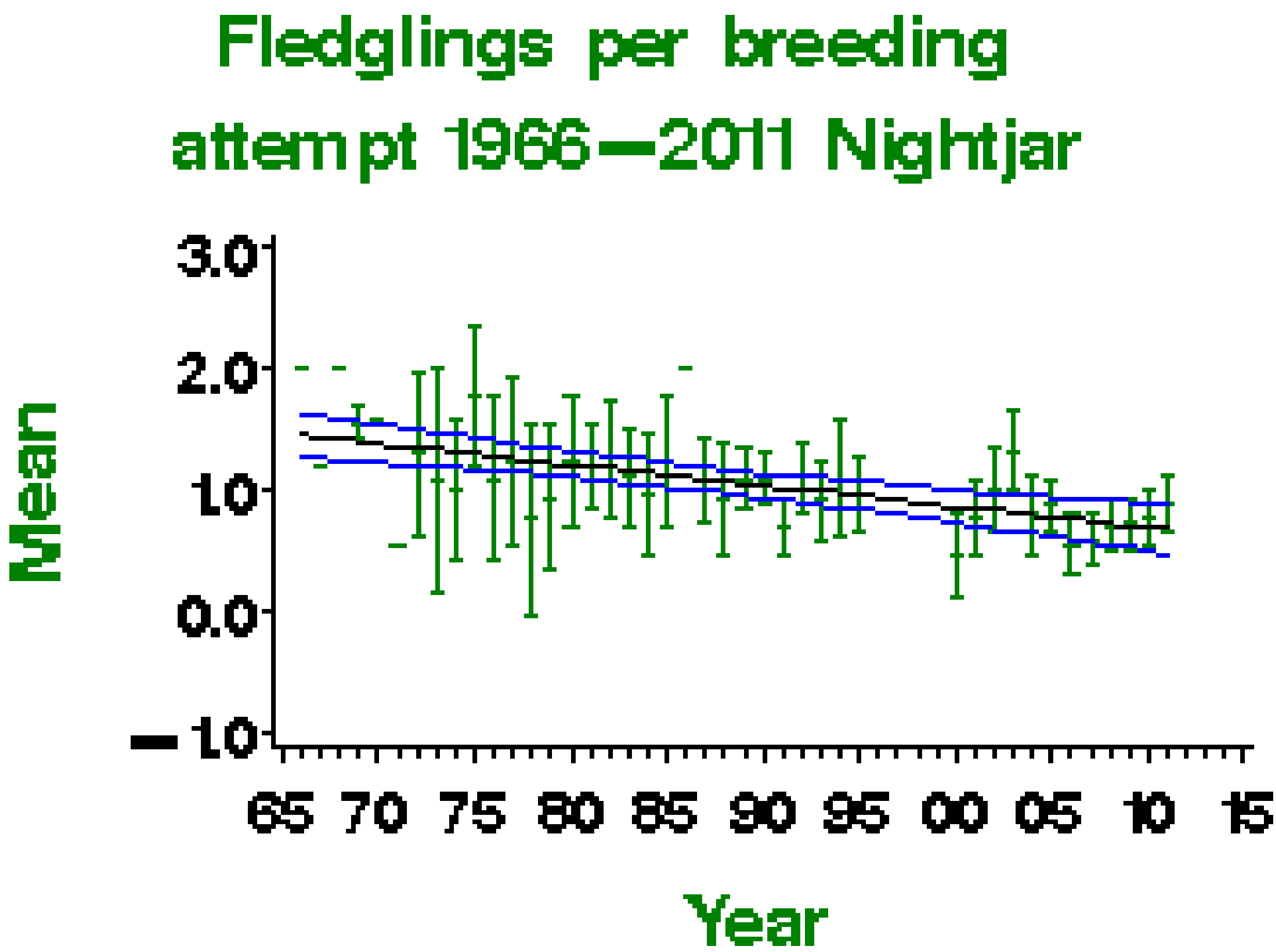
Status summary

Following a catastrophic decline in range of more than 50% of 10-km squares between breeding atlases, the 1992 national survey revealed a welcome increase of 50% in population size since 1981, probably due to the increased availability of young forest habitat as plantations were felled and replanted (Morris et al. 1994). A National Nightjar Survey in 2004 revealed that a further 36% increase had taken place in the UK population in 12 years, with a 2.6% increase in the number of 10-km squares occupied (Conway et al. 2007). There was evidence of population declines and range contractions since 1992, however, in North Wales, northwest England, and Scotland. Although annual nest record sample are very small, the increases in nest failure rates and decreases in clutch and brood sizes have resulted in the inclusion of Nightjar on the NRS concern list (Leech & Barimore 2008). A steep linear decrease is evident in the number of fledglings per breeding attempt. A recent study suggests that nest failure is most likely in areas heavily frequented by walkers and dogs (Langston et al. 2007).

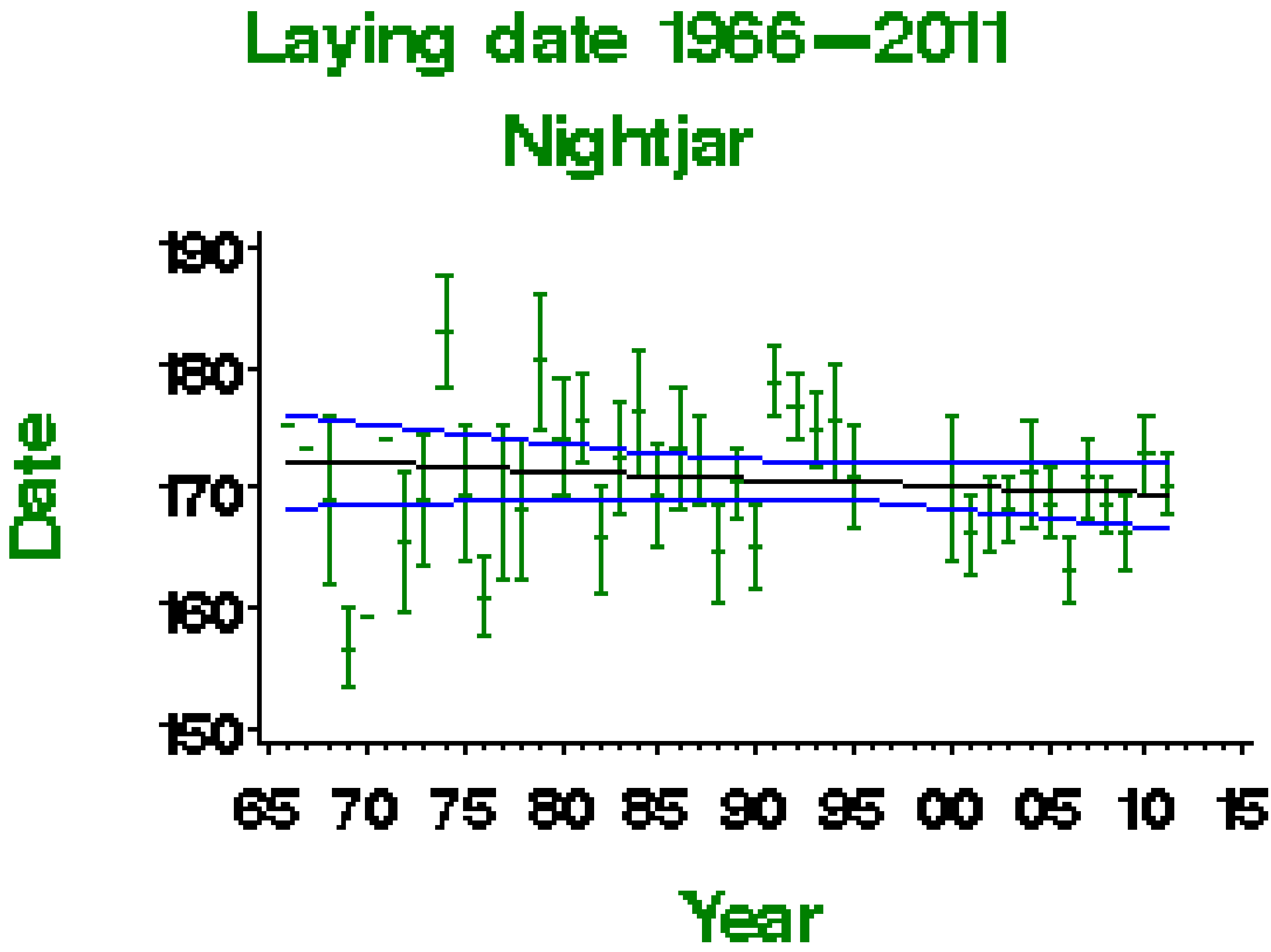
Population changes in detail

Annual breeding population changes for this species are not currently monitored by BTO

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend



Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

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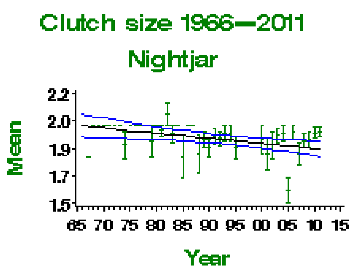
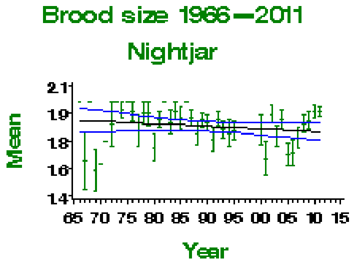
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	21	Linear decline	1.43 fledglings	0.71 fledglings	-50.5%		
Clutch size	42	1968-2010	19	Linear decline	1.99 eggs	1.85 eggs	-6.8%		Small sample
Brood size	42	1968-2010	27	None					Small sample
Nest failure rate at egg stage	42	1968-2010	24	Linear increase	1.24% nests/day	3.84% nests/day	209.7%		Small sample
Nest failure rate at chick stage	42	1968-2010	22	Curvilinear	0.16% nests/day	0.86% nests/day	437.5%		Small sample
Laying date	42	1968-2010	20	None			0 days		Small sample

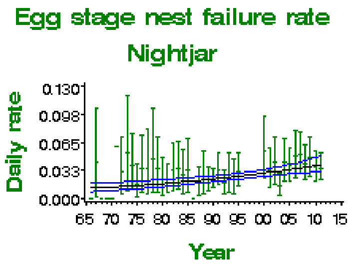
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



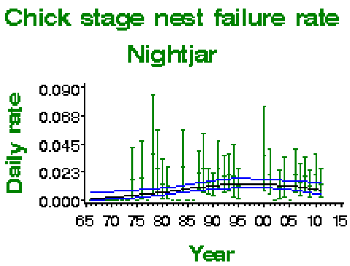
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

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Swift

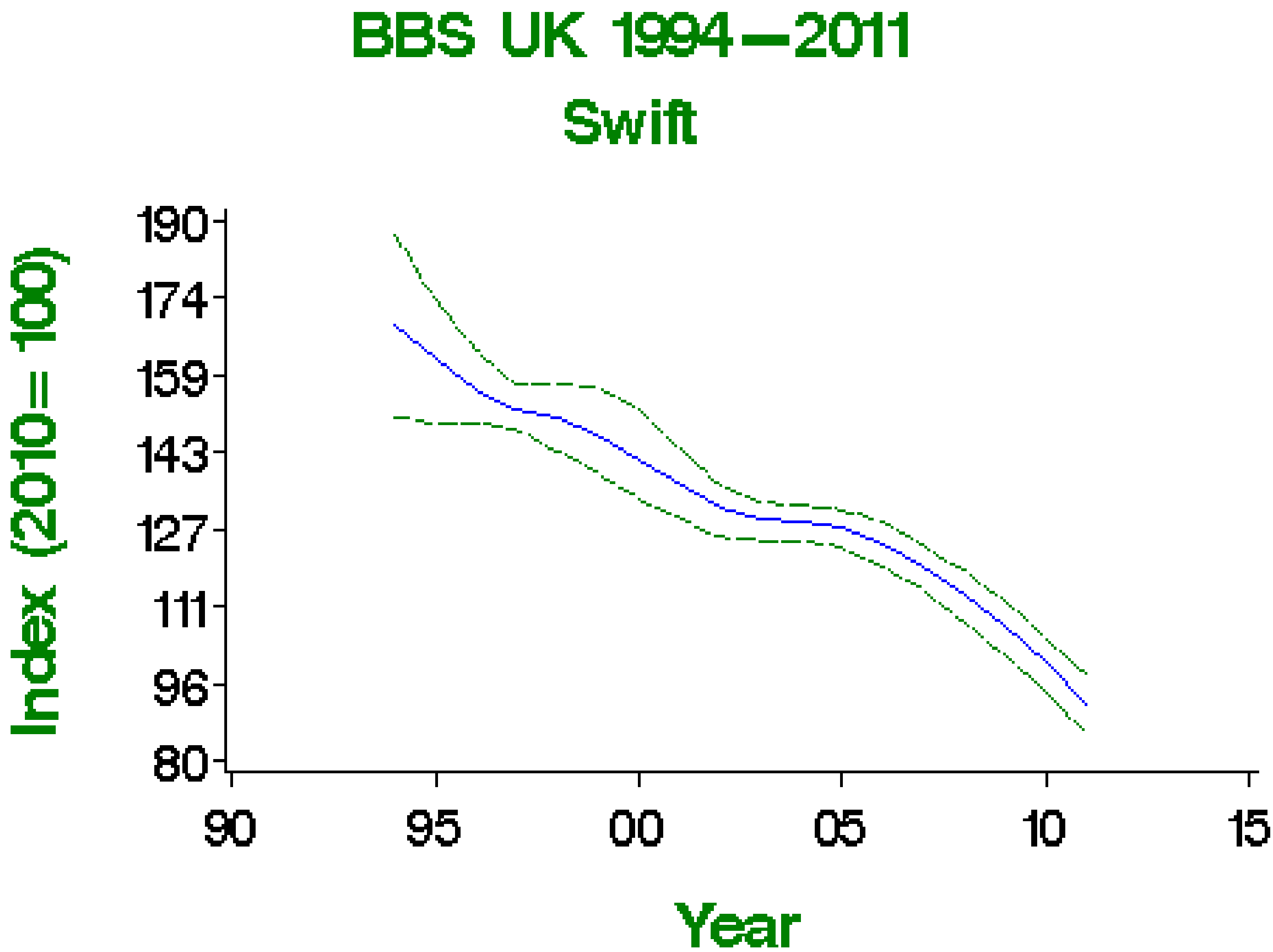
Apus apus

Key facts

Conservation listings:	Europe: no SPEC category (favourable conservation status in Europe, not concentrated in Europe) (BiE04) UK: amber (25-50% decline) (BoCC3)
Long-term trend:	UK: decline
Population size:	87,000 (64,000-111,000) pairs in 2009 (APEP13: distance sampling estimate for 2006 (Newson et al. 2008) updated using BBS trend)

Status summary

Swifts were not monitored before the inception of the BBS. Their monitoring is complicated by the difficulty of finding occupied nests, by the weather-dependent and sometimes extraordinary distances from the nest at which breeding adults may forage, and by the often substantial midsummer influx of non-breeding individuals to the vicinity of breeding colonies. Since Swifts do not normally begin breeding until they are four years old, non-breeding numbers can be large. BBS results suggest steep declines in England, Scotland and Wales. Many Swifts seen on BBS visits will not be nesting nearby, however, and the relationship between BBS transect counts and nesting numbers is not properly understood so far. The BBS Eaton et al. 2009). Crowe et al. 2010). There has been little long-term change across Europe since 1980 (PECBMS 2012a).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

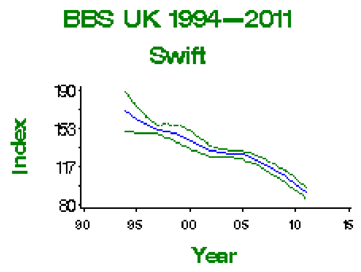
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	15	1995-2010	1024	-38	-45	-30	>25	
	10	2000-2010	1102	-29	-35	-22	>25	
	5	2005-2010	1213	-22	-26	-16		
BBS England	15	1995-2010	884	-38	-46	-30	>25	

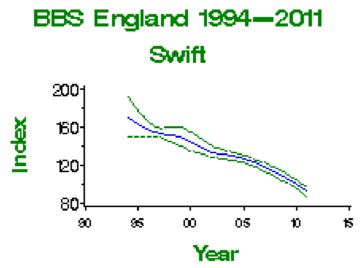
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	10	2000-2010	947	-30	-38	-22	>25	
	5	2005-2010	1050	-21	-26	-17		
BBS Scotland	15	1995-2010	50	-39	-61	-15	>25	
	10	2000-2010	54	-1	-34	46		
	5	2005-2010	60	-4	-32	31		
BBS Wales	15	1995-2010	67	-57	-68	-41	>50	
	10	2000-2010	73	-55	-68	-40	>50	
	5	2005-2010	73	-43	-55	-29	>25	

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

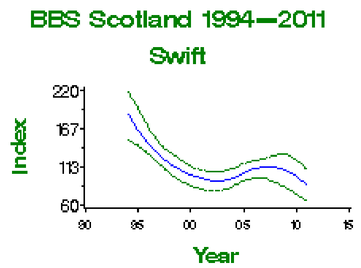
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



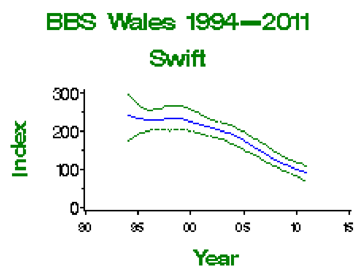
BBS UK graph



BBS England graph



BBS Scotland graph



BBS Wales graph

Demographic trends

Productivity and survival trends for this species are not currently produced by BTO

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Kingfisher

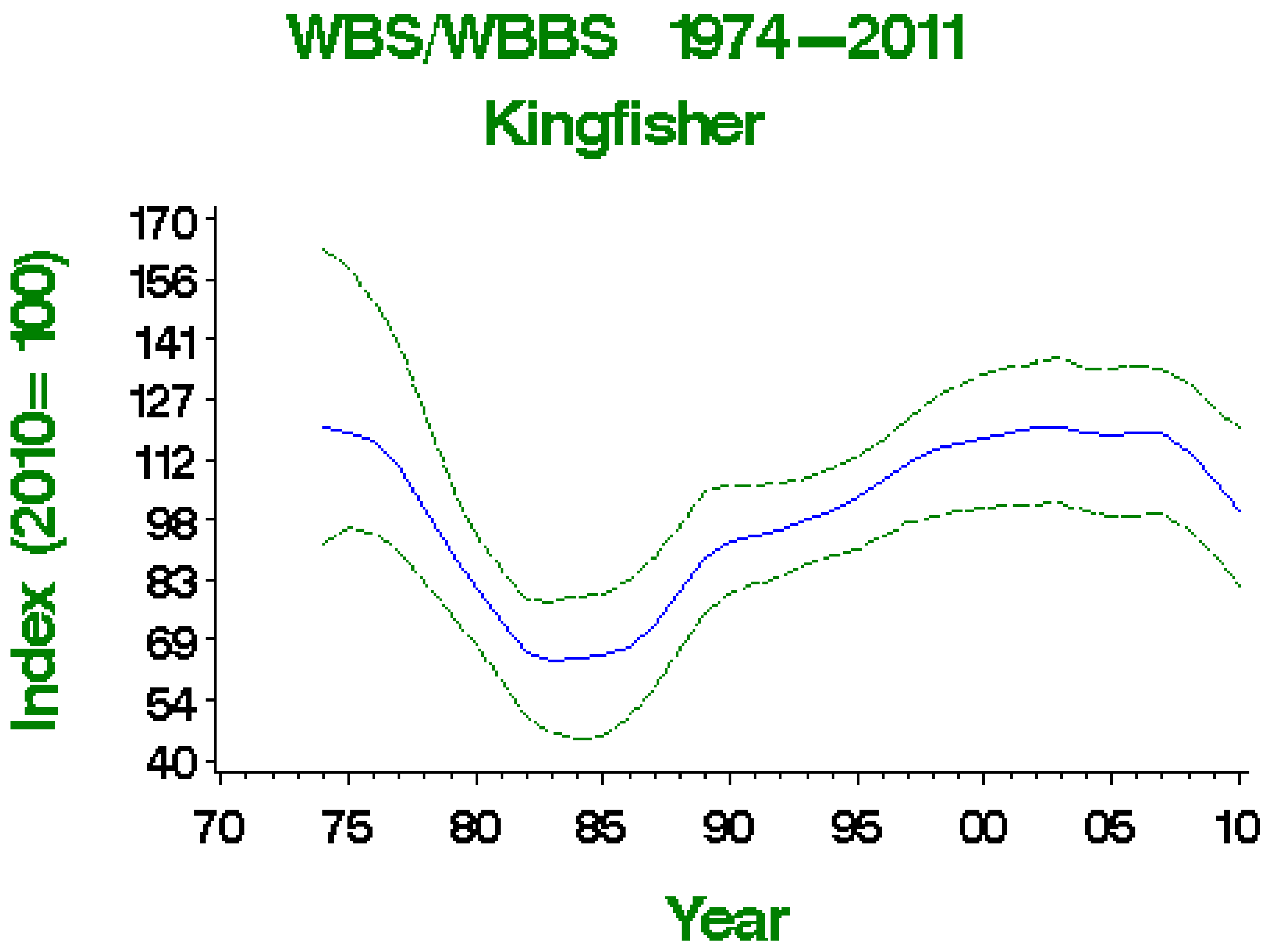
Alcedo atthis

Key facts

Conservation listings:	Europe: SPEC category 3 (depleted) (BiE04) UK: amber (European status) (BoCC3)
Long-term trend:	UK waterways: fluctuating, with no long-term trend
Population size:	3,800-6,400 pairs in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Status summary

The Kingfisher declined along linear waterways (its principal habitat) until the mid 1980s, since when it seems to have made a complete recovery. The decline was associated with a contraction of range in England (Gibbons et al. 1993). Kingfishers suffer severe mortality during harsh winters but, with up to three broods in a season, and up to six chicks in a brood, their potential for rapid population growth is unusually high. Amber listing of this species in the UK results from its 'depleted' status in Europe as a whole, following declines between 1970 and 1990 (BirdLife International 2004).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
WBS/WBBS waterways	35	1975-2010	54	-16	-47	24		
	25	1985-2010	64	53	-1	155		
	10	2000-2010	99	-15	-29	4		
	5	2005-2010	95	-15	-30	6		
BBS UK	15	1995-2010	55	-33	-48	-8	>25	

Source	10 Period (yrs) 5	2000-2010 Years 2005-2010	61 Plots (n) 67	-34 Change (%) -43	-57 Lower limit -53	-10 Upper limit -29	>25 Alert >25	Comment
BBS England	15	1995-2010	48	-26	-41	1		
	10	2000-2010	54	-20	-35	1		
	5	2005-2010	61	-38	-45	-24	>25	

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

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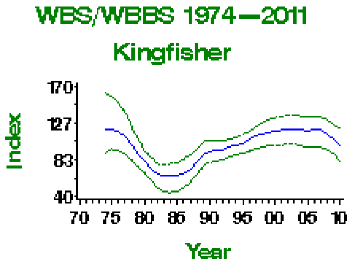
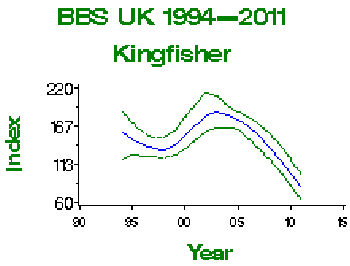
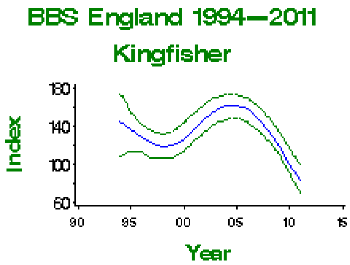


WBS/WBBS waterways graph



BBS UK graph



BBS England graph

Demographic trends

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Green Woodpecker

Picus viridis

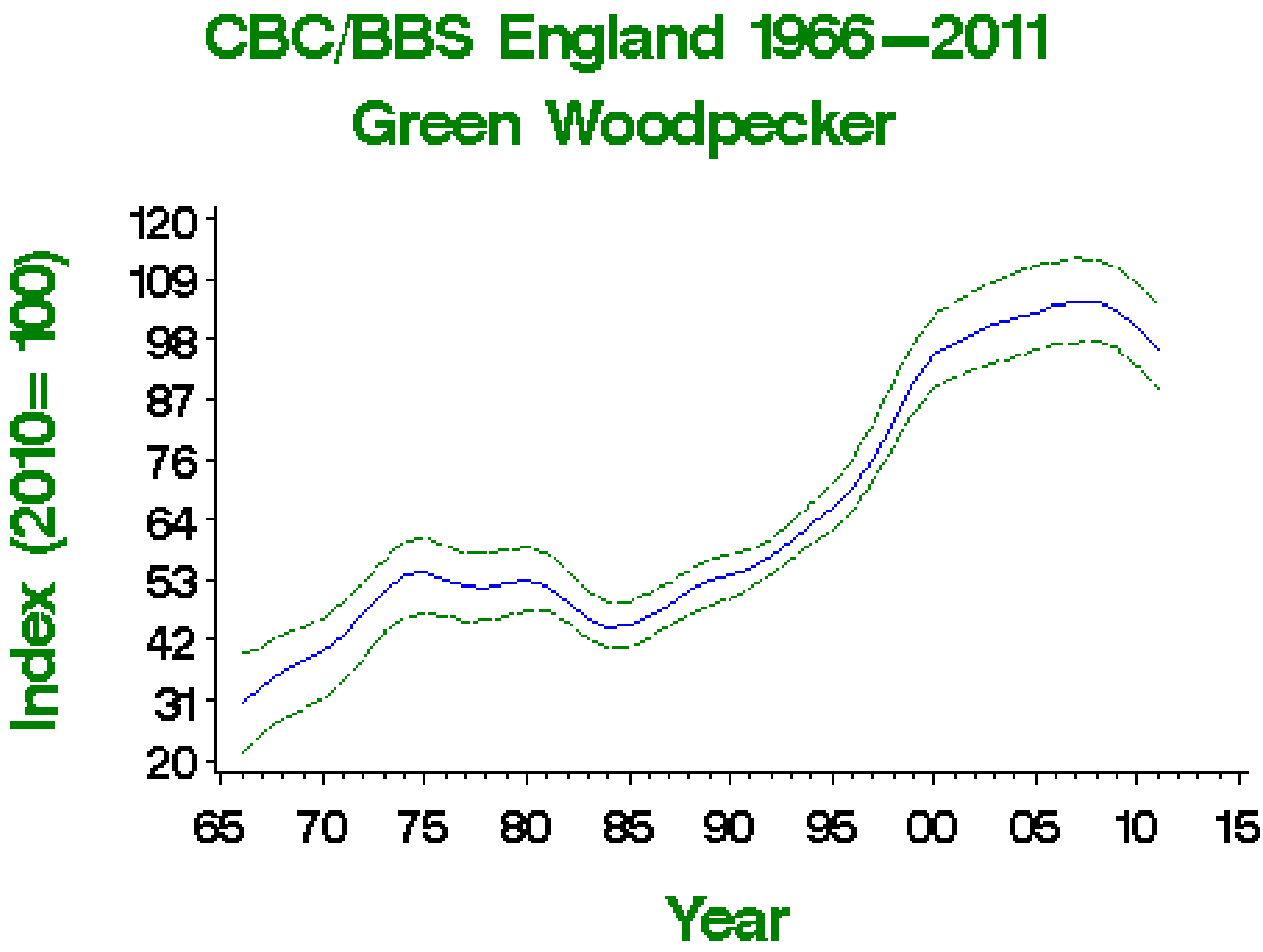
Key facts

Conservation listings:	Europe: SPEC category 2 (depleted) (BiE04) UK: amber (European status) (BoCC3)
Long-term trend:	England: rapid increase
Population size:	52,000 (47,000-58,000) pairs in 2009 (APEP13: distance sampling estimate for 2006 (Newson et al. 2008) updated using BBS trend)

Migrant status:	Resident
Nesting habitat:	Cavity nester
Primary breeding habitat:	Woodland
Secondary breeding habitat:	
Breeding diet:	Animal
Winter diet:	Animal

Status summary

Green Woodpecker populations have risen steadily in Britain since 1966, except for a period of stability or shallow decline centred around 1980. There was considerable range expansion in central and eastern Scotland between the 1968-72 and 1988-91 atlas periods. Recent results indicate that the current phase of increase might be continuing across England, but not in Wales, where some contraction of range has recently been detected. The BBS PECBMS 2012a).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	43	1967-2010	326	199	121	354		
	25	1985-2010	515	123	89	168		
	10	2000-2010	874	5	0	11		
	5	2005-2010	1000	-3	-6	1		
BBS UK	15	1995-2010	800	40	30	49		
	10	2000-2010	925	6	1	12		
	5	2005-2010	1065	-4	-7	0		
BBS England	15	1995-2010	741	48	38	59		
	10	2000-2010	858	7	1	12		
	5	2005-2010	988	-3	-7	0		
BBS Wales	15	1995-2010	48	-9	-32	15		
	10	2000-2010	53	-4	-24	17		
	5	2005-2010	56	-9	-25	10		

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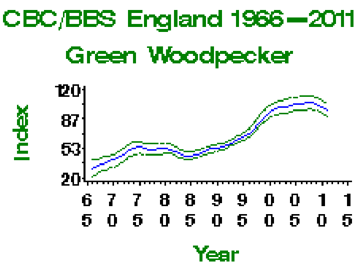
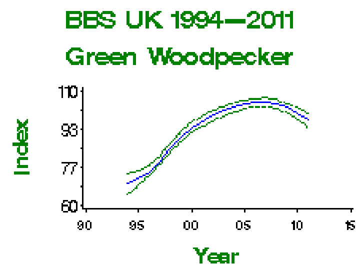
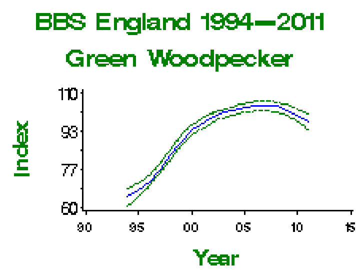


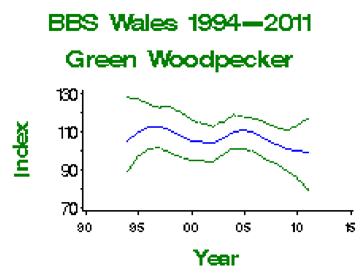
CBC/BBS England graph



BBS UK graph



BBS England graph



BBS Wales graph

Demographic trends

Productivity and survival trends for this species are not currently produced by BTO

Causes of change

There is little evidence available regarding the demographic or ecological causes of population increase in this species.

Change factor	Primary driver	Secondary driver
Demographic	Unknown	
Ecological	Unknown	

Further information on causes of change

No information on demographic trends for this species is available. The ecological factors underlying the increase in population size are not yet known but, given the species' susceptibility to cold weather, it may be related to climate change. Smith (2007) found that Green Woodpeckers were not limited by nest-sites in his study woods in southern England and linked the upward trend in numbers to the availability of food outside the woods and higher survival due to a series of mild winters.

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Great Spotted Woodpecker

Dendrocopos major

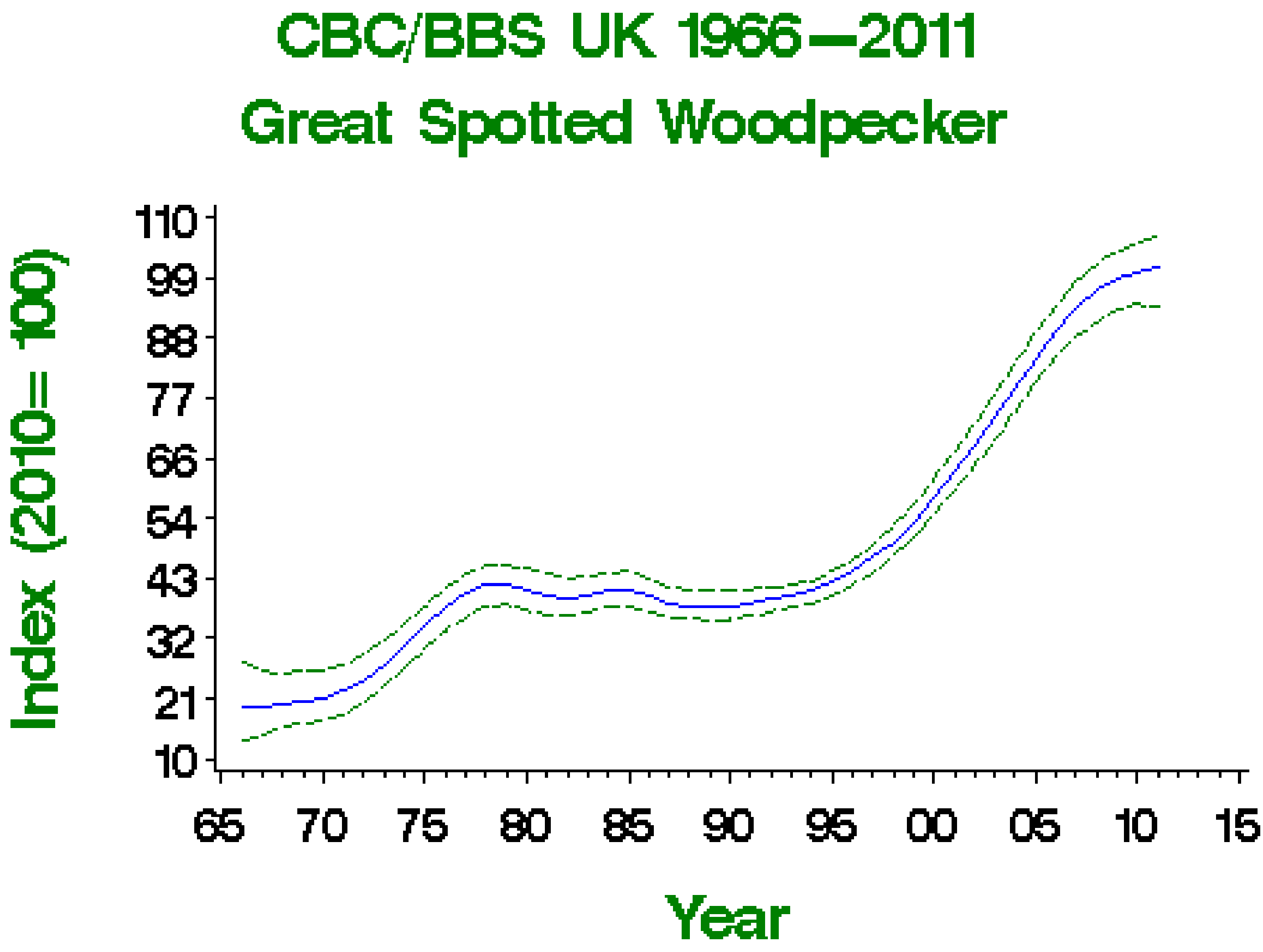
Key facts

Conservation listings:	Europe: no SPEC category (favourable conservation status in Europe, not concentrated in Europe) (BiE04) UK: green (species level); amber (race *anglicus*, >20% of European breeders) (BoCC3)
Long-term trend:	UK, England: rapid increase
Population size:	140,000 (130,000-150,000) pairs in 2009 (APEP13: distance sampling estimate for 2006 (Newson et al. 2008) updated using BBS trend)

Migrant status:	Resident
Nesting habitat:	Cavity nester
Primary breeding habitat:	Woodland
Secondary breeding habitat:	
Breeding diet:	Animal
Winter diet:	Animal

Status summary

This species increased rapidly in the 1970s and began a further increase in the early 1990s. The BBS PECBMS 2012a).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

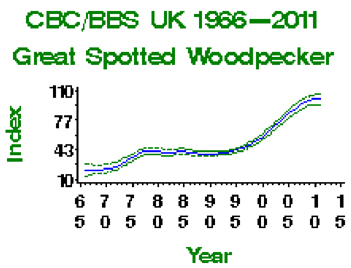
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment

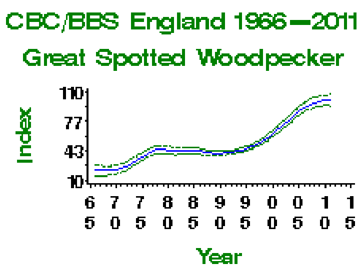
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	439	408	247	657		
	25	1985-2010	694	144	113	174		
	10	2000-2010	1234	73	63	81		
	5	2005-2010	1478	19	15	23		
CBC/BBS England	43	1967-2010	389	369	257	659		
	25	1985-2010	614	128	101	164		
	10	2000-2010	1082	60	50	68		
	5	2005-2010	1289	14	10	18		
BBS UK	15	1995-2010	1015	141	126	157		
	10	2000-2010	1224	71	63	79		
	5	2005-2010	1478	20	16	24		
BBS England	15	1995-2010	884	122	108	137		
	10	2000-2010	1059	58	48	66		
	5	2005-2010	1266	14	10	18		
BBS Scotland	15	1995-2010	45	312	211	462		
	10	2000-2010	59	140	94	207		
	5	2005-2010	81	31	10	53		
BBS Wales	15	1995-2010	74	192	129	268		
	10	2000-2010	89	129	96	174		
	5	2005-2010	105	58	33	76		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

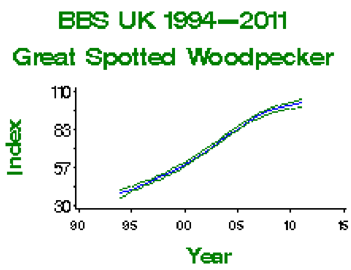
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



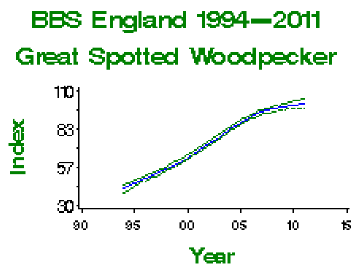
CBC/BBS UK graph



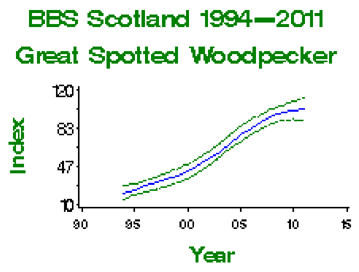
CBC/BBS England graph



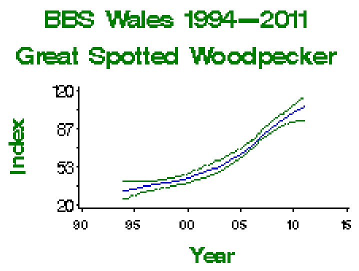
BBS UK graph



BBS England graph

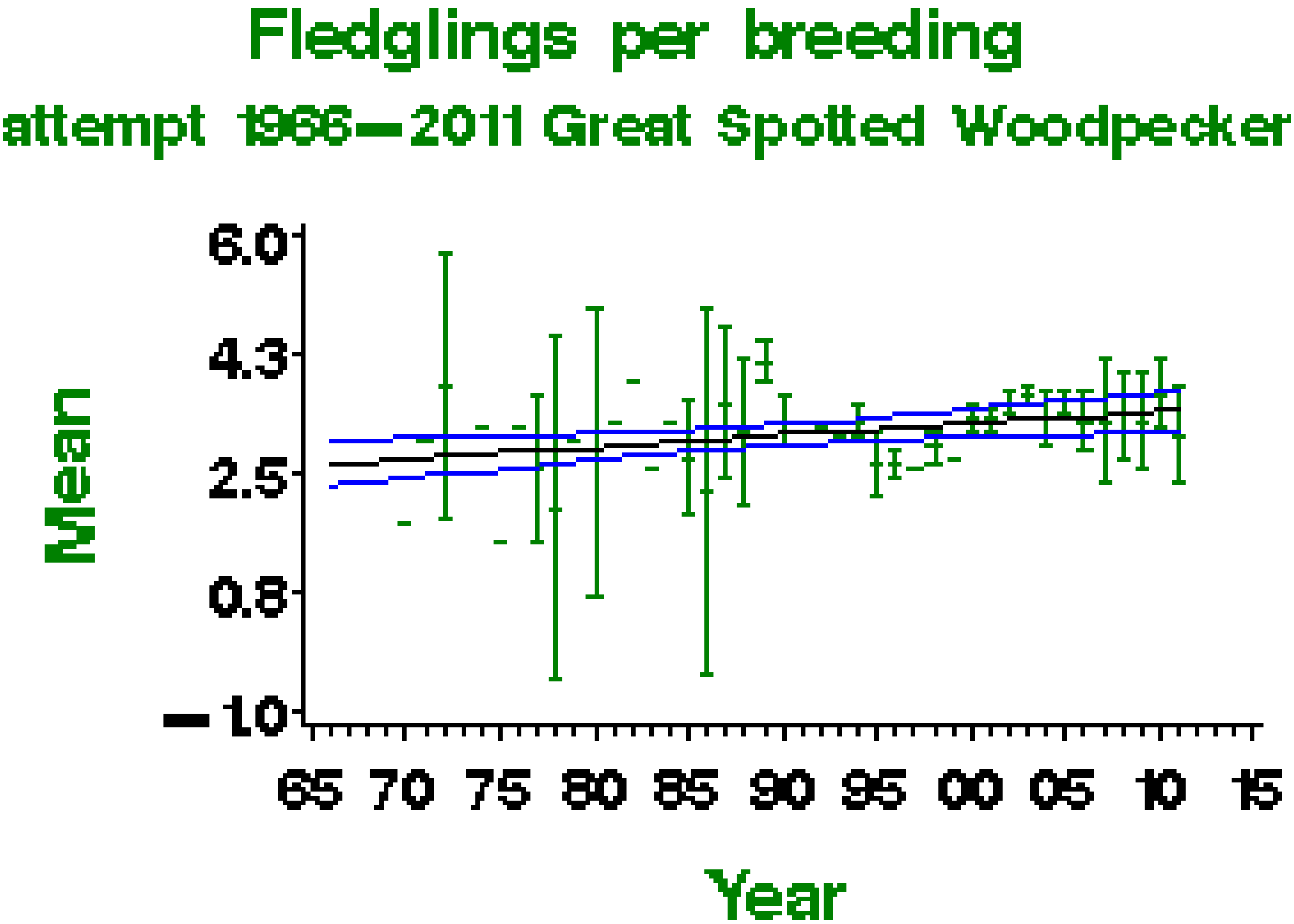


BBS Scotland graph

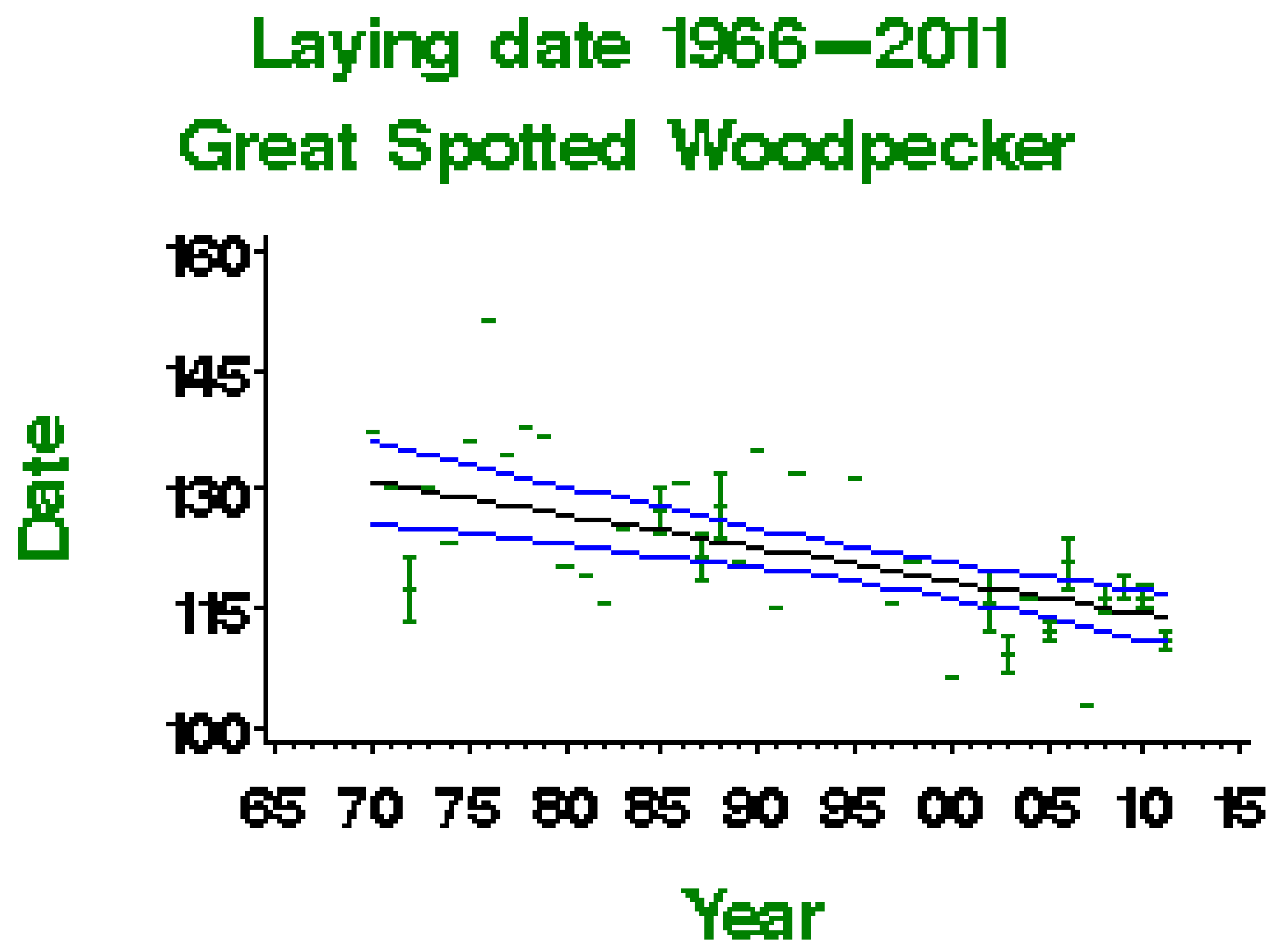


BBS Wales graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

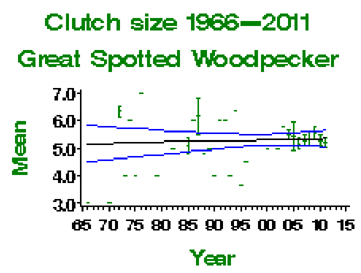


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

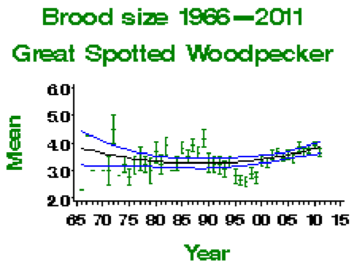
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Brood size	42	1968-2010	30	Curvilinear	3.72 chicks	3.78 chicks	1.8%		Small sample
Nest failure rate at chick stage	42	1968-2010	35	None					

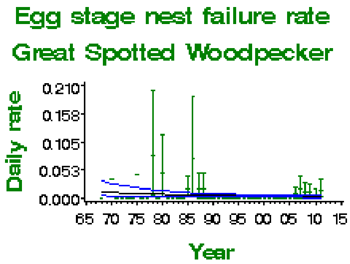
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



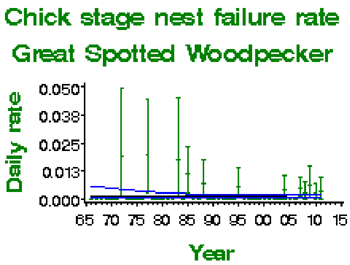
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

Causes of change

There is good evidence that nest survival has increased, most likely due to decreased competition with Starlings. This is based on one local study but supported by more extensive analysis of nest record cards.

Change factor	Primary driver	Secondary driver
Demographic	Increased breeding success	
Ecological	Decreased competition	

Further information on causes of change

The initial increase in Great Spotted Woodpeckers during the 1970s has been attributed to Dutch elm disease, which greatly increased the amount of standing dead timber, thereby increasing associated insects and so improving food supplies and providing nest sites (Marchant et al. 1990). However, studies giving demographic evidence supporting the effects of this are sparse. There has been speculation that the storms of 1987 and 1990 also benefited Great Spotted Woodpeckers by increasing the availability of dead wood, although a detailed study by Smith (1997), in two study woodlands, reported no specific link between woodpecker increase and the storms, despite the increase in dead wood.

A long-term study of the breeding success of an increasing population of Great Spotted Woodpeckers in southern England provides good evidence that nest survival has increased dramatically over the last 20 years (Smith 2005, 2006). Nest-site interference by Starlings was frequent during the 1980s and was described as the main cause of low nest survival and delayed nesting. Smith found that Starling numbers declined to such an extent later in the study that they ceased to nest in the study woods and nest-site interference was no longer a factor. Thus, the reduction in nest-site competition from Starlings is likely to be one of the factors contributing to the increase in Great Spotted Woodpeckers. Smith (2005) analysed national nest record cards and found similar trends in nest survival, supporting the hypothesis that reduced competition with Starlings has led to the increase in woodpecker population. The decline in Starling numbers in recent decades may also have allowed Great Spotted Woodpeckers to expand their breeding distribution into less wooded habitats (Smith 2005).

It is possible that recent increases of Great Spotted Woodpeckers, are also, at least in part, driven by changing climate (Fuller et al. 2005). In Scandinavia (Nilsson et al. 1992) and Bialowiecza Forest, Poland (Wesolowski & Tomialojc 1986), breeding numbers were found to be related to the severity of the preceding winter and the availability of conifer seeds on which the birds then feed. No similar relationship has been found in Britain (Marchant et al. 1990), which is probably not surprising given our relatively mild winters (Smith 1997). Smith (2006) found no evidence that increasing spring temperatures impacted on clutch size, nesting success or number of young fledged.

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Lesser Spotted Woodpecker

Dryobates minor

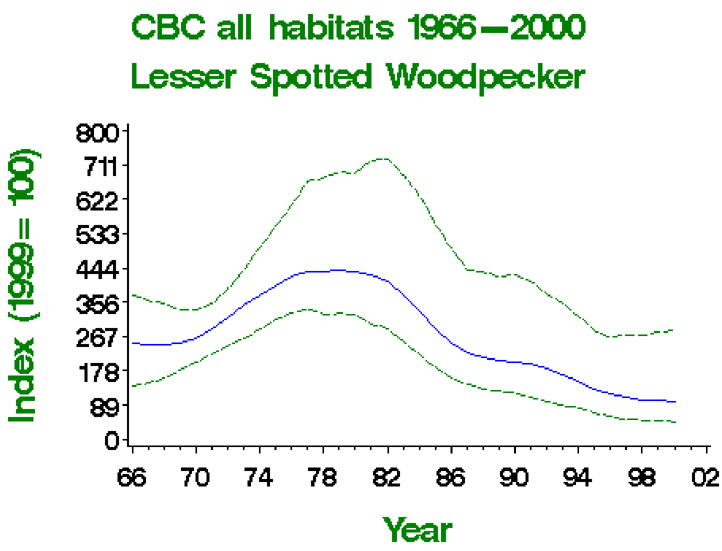
Key facts

Conservation listings:	Europe: no SPEC category (favourable conservation status in Europe, not concentrated in Europe) (BiE04) UK: red (>50% population decline) (BoCC3); an RBBP species UK Biodiversity Action Plan: priority species
Long-term trend:	UK: rapid decline
Population size:	1,000-2,000 pairs in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Migrant status:	Resident
Nesting habitat:	Cavity nester
Primary breeding habitat:	Woodland
Secondary breeding habitat:	
Breeding diet:	Animal
Winter diet:	Animal

Status summary

The Lesser Spotted Woodpecker has declined significantly and very rapidly since around 1980, following a shallower increase; it had already contracted in range between the first two atlas periods (Gibbons et al. 1993), and has subsequently disappeared from many more of its former localities. It has become so rare that BBS observers have been unable to continue the annual monitoring that was possible until 2000 through CBC. The species qualifies easily for red listing. All UK breeding records since 2010 should be forwarded to the Rare Breeding Birds Panel. Lesser Spotted Woodpecker has been one of the most strongly declining bird species in Europe, with widespread steep decrease since 1980 (but with a wide confidence interval: PECBMS 2007, 2012a).



Smoothed population index, relative to an arbitrary 100 in 1999, with 85% confidence limits in green

Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC all habitats	31	1968-1999	17	-60	-81	40		Small CBC sample
	25	1974-1999	18	-73	-86	-31	>50	Small CBC sample
	10	1989-1999	11	-51	-75	-22	>50	Small CBC sample
	5	1994-1999	9	-33	-56	0		Small sample

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB

CBC all habitats graph

Demographic trends

Productivity and survival trends for this species are not currently produced by BTO

Causes of change

The demographic causes of decline are not yet known and, although there is low breeding success in some populations, the reasons for the decline are unclear.

Change factor	Primary driver	Secondary driver
Demographic	Unknown	
Ecological	Unknown	

Further information on causes of change

The demographic causes of decline are not yet known, and although there is low breeding success in some populations the reasons for the decline in the UK and elsewhere in Europe are unclear (Charman et al. 2009). A detailed field study in Sweden provided good evidence that neither clutch size, brood size in successful nests, fledging success in successful nests nor mean nestling weight differed significantly between years, despite a threefold difference in population variation (Wiktander et al. 2001).

Loss of open woodland is one factor that has been suggested to have contributed to declines in this species. Lesser Spotted Woodpecker is a species that requires mature, open woodland and large areas of woodland at a landscape scale (Wiktander et al. 2001, Charman et al. 2010). Wiktander et al. postulate that the decrease in the area of deciduous forest in Sweden is probably one cause of this species' decline, although they present no specific evidence to support this (Wiktander et al. 1992). Loss of dead wood within woodlands has been proposed as another factor; however, given that dead wood has increased in Britain (Amar et al. 2010) this seems an unlikely cause here. A field study in Poland provided evidence that Lesser Spotted Woodpecker presence is closely correlated with the amount of dead wood and large deciduous trees (Angelstam et al. 2002). In their review of the causes of declines of woodland birds Fulleret al. (2005) state that reductions in small-diameter dead wood suitable for foraging may be a factor in the decline, although recent surveys provided evidence that there was no difference in dead-wood abundance between occupied and unoccupied woods (Charman et al. 2010). However, dead snags have a high turnover and were found to be suitable for nesting sites by woodpeckers for only a few years after death and, furthermore, dead-wood conditions may now be more favourable for Great Spotted Woodpeckers (Smith 2007).

A third hypothesis relates to competition and predation. A field study in Sweden found that Great Spotted Woodpeckers compete with Lesser Spotteds for insect food in dead wood when spruce seed crops are low (Nilsson et al. 1992), but evidence for this in Britain is limited (Charmanet al. 2010). The two species may compete for nest sites, since they overlap considerably in their use of nesting substrates (Glue & Boswell 1994). Amar et al. (2006) found that Lesser Spotted Woodpecker decreased more heavily in woods with relatively high numbers of grey squirrel dreys but there was no other evidence that squirrel density was a significant factor in declines.

Changing climate has been found to have an impact on survival and reproduction in some populations. In Norway, a positive relationship between spring numbers of Lesser Spotted Woodpecker and previous June temperatures has been interpreted as an effect of temperatures on woodpecker survival and reproduction during the breeding season (Steen et al. 2006, Selas et al. 2008). Steen et al. (2006) also found that winter temperatures exhibit a direct positive effect on winter survival. However, given that there has been a general trend for increasing temperatures in the UK (see here), it seems unlikely that changes in climate have been responsible for Lesser Spotted Woodpecker declines. Work in Sweden and Germany suggests that changes in phenology could play a role in breeding success, finding that declines in food availability during the breeding season are likely to be related to seasonal declines in reproductive performance as woodpeckers adjust their timing of breeding to coincide with the seasonal food peak (Wiktander et al. 2001, Rossmanith et al. 2007). However, there is little further evidence for this. In Britain, breeding success has fallen and is lower than in recent studies in Germany and Sweden; chick mortality is especially high, most probably related to food shortages in the breeding period (Charman et al. 2012, Smith & Charman 2012).

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Magpie

Pica pica

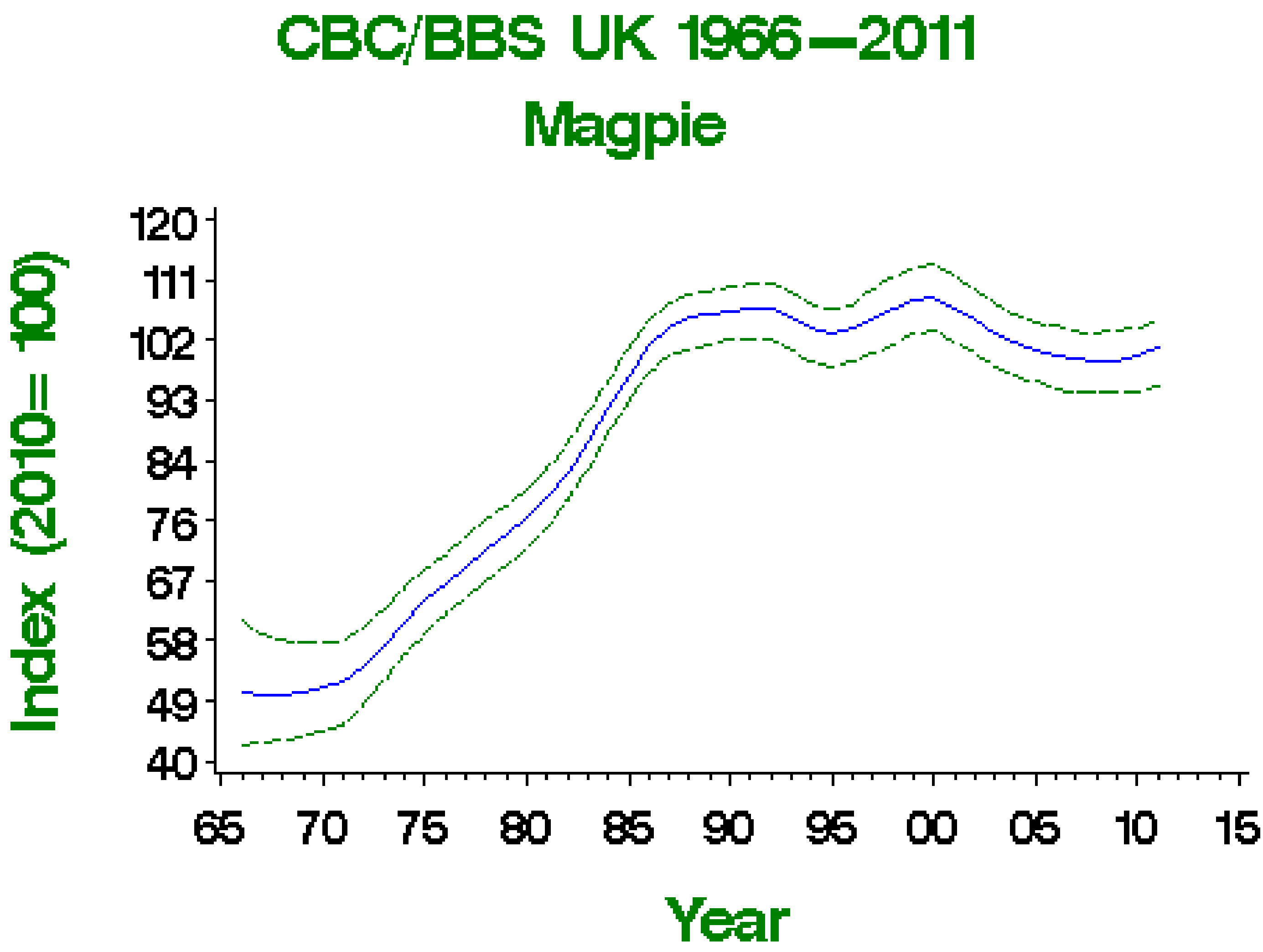
Key facts

Conservation listings:	Europe: no SPEC category (not concentrated in Europe, conservation status favourable) (BiE04) UK: green (BoCC3)
Long-term trend:	UK: moderate increase England: rapid increase
Population size:	600,000 territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Migrant status:	Resident
Nesting habitat:	Above-ground nester
Primary breeding habitat:	Woodland
Secondary breeding habitat:	Human habitats
Breeding diet:	Animal
Winter diet:	Vegetation

Status summary

Magpies increased steadily until the late 1980s, after which abundance stabilised (Gregory & Marchant 1996). The BBS PECBMS 2012a).



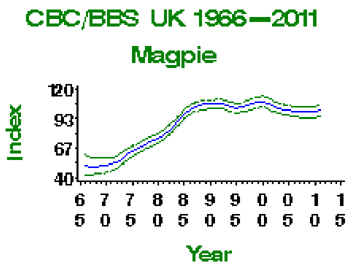
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

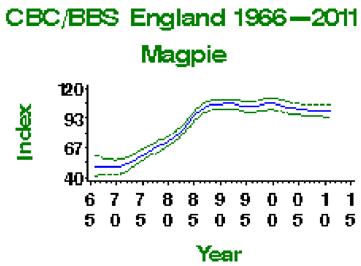
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	791	101	61	151		
	25	1985-2010	1252	3	-6	11		
	10	2000-2010	2066	-8	-11	-5		
	5	2005-2010	2319	-1	-4	2		
CBC/BBS England	43	1967-2010	670	105	59	157		
	25	1985-2010	1057	5	-5	16		
	10	2000-2010	1725	-6	-9	-3		
	5	2005-2010	1954	-1	-3	1		
BBS UK	15	1995-2010	1841	-2	-6	3		
	10	2000-2010	2040	-8	-11	-5		
	5	2005-2010	2294	-1	-4	1		
BBS England	15	1995-2010	1541	-3	-7	1		
	10	2000-2010	1702	-6	-8	-3		
	5	2005-2010	1932	-1	-4	1		
BBS Scotland	15	1995-2010	45	13	-16	60		
	10	2000-2010	51	-5	-25	22		
	5	2005-2010	59	-3	-20	21		
BBS Wales	15	1995-2010	161	-9	-20	2		
	10	2000-2010	178	-9	-18	0		
	5	2005-2010	185	7	0	16		
BBS N.Ireland	15	1995-2010	82	17	-10	38		
	10	2000-2010	95	-16	-24	-7		
	5	2005-2010	102	-7	-15	3		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

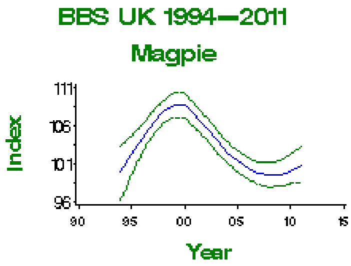
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



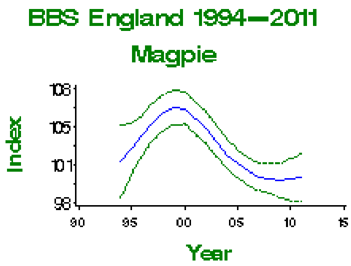
CBC/BBS UK graph



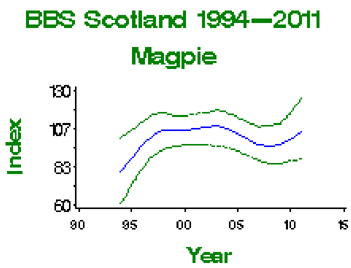
CBC/BBS England graph



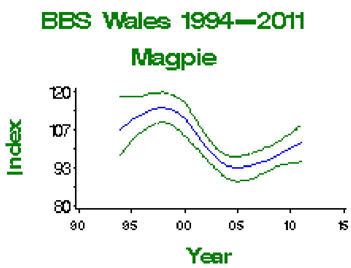
BBS UK graph



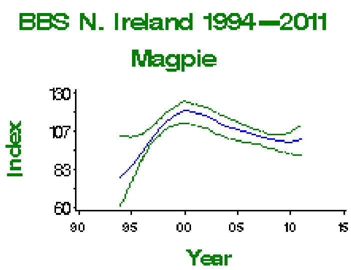
BBS England graph



BBS Scotland graph

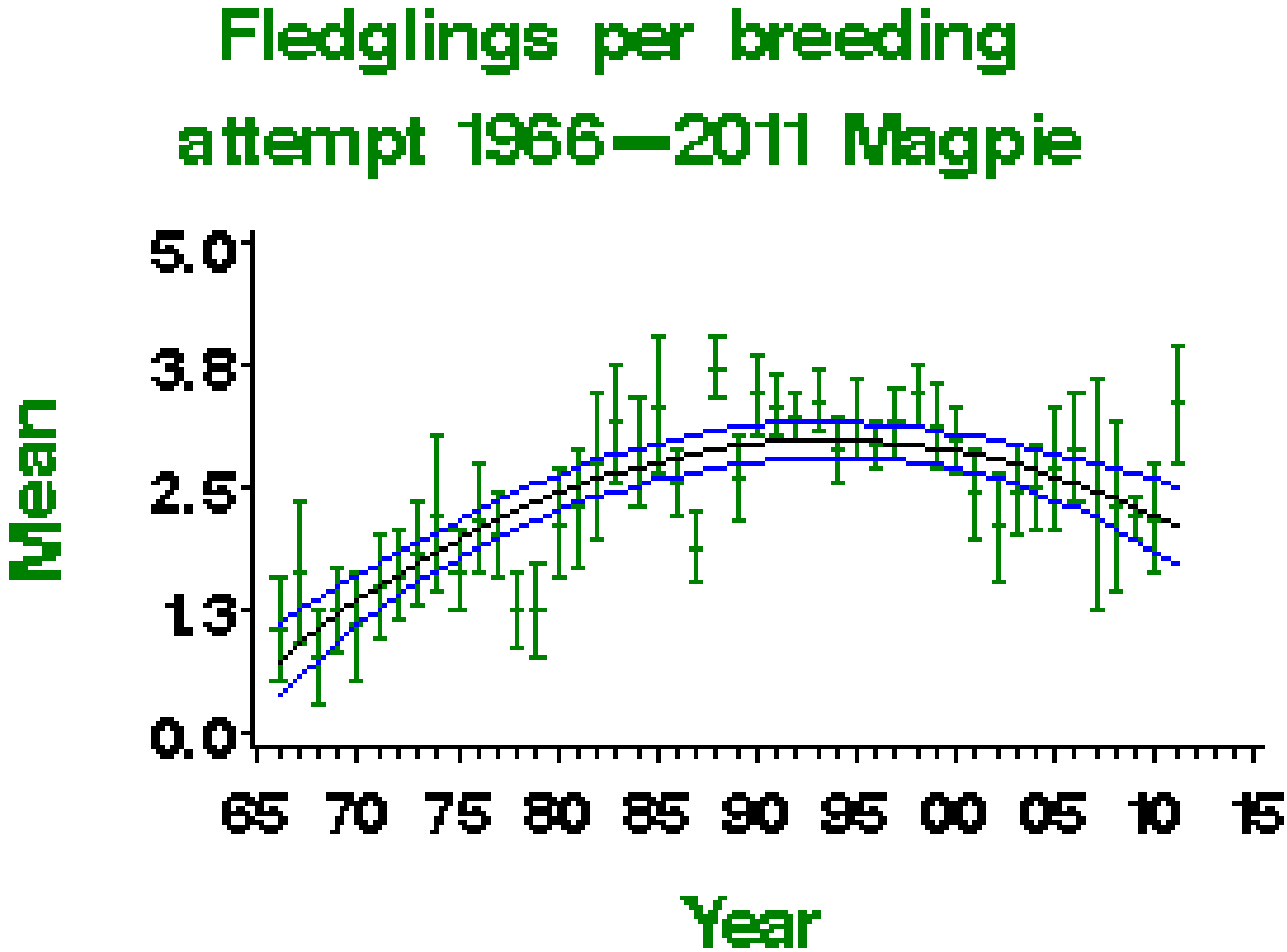


BBS Wales graph

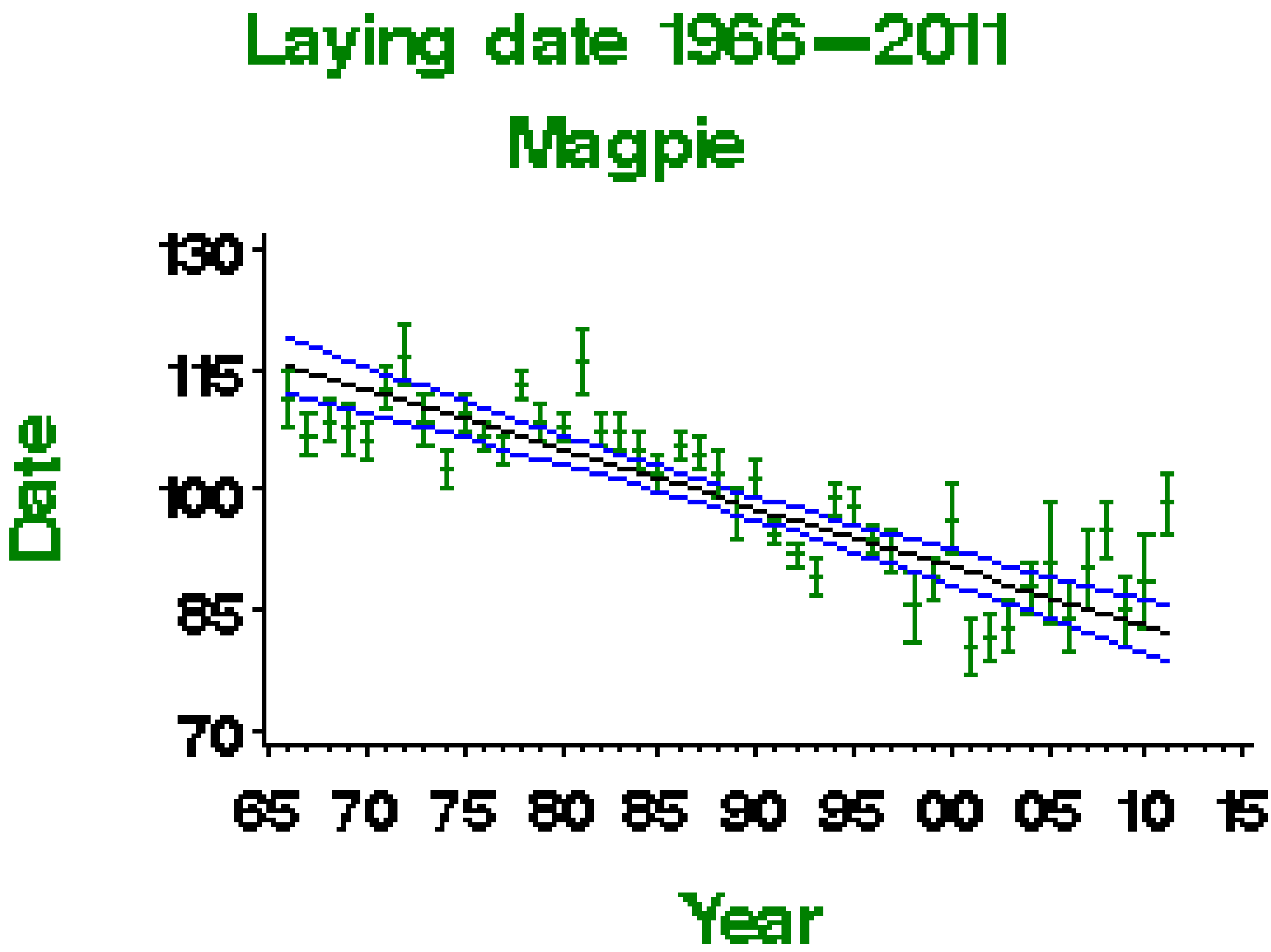


BBS N.Ireland graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

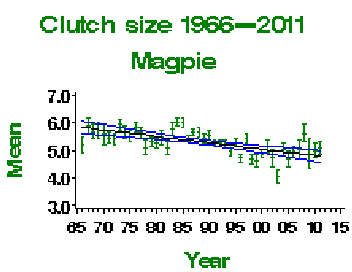


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

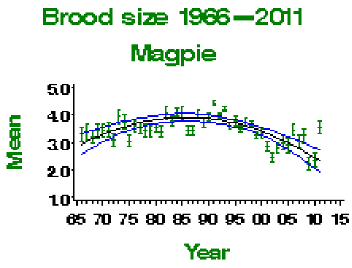
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	42	Curvilinear	1.07 fledglings	2.23 fledglings	108.5%		
Clutch size	42	1968-2010	42	Linear decline	5.79 eggs	4.82 eggs	-16.9%		
Brood size	42	1968-2010	74	Curvilinear	3.12 chicks	2.45 chicks	-21.5%		
Nest failure rate at egg stage	42	1968-2010	48	Linear decline	2.75% nests/day	0.20% nests/day	-92.7%		
Nest failure rate at chick stage	42	1968-2010	47	Linear decline	1.65% nests/day	0.12% nests/day	-92.7%		
Laying date	42	1968-2010	32	Linear decline	Apr 24	Mar 24	-31 days		

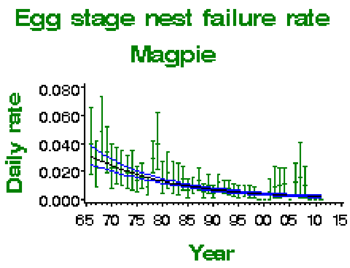
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



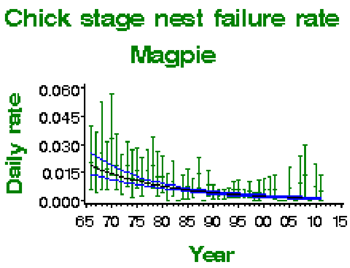
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

Causes of change

The number of fledglings per breeding attempt increased dramatically up until the 1990s but then stabilised, a pattern mirroring the population index, which suggests that changing breeding success has been an important driver of population change. There is little published evidence about the ecological drivers of change. Changes in control of Magpies could have played a role, but their generalist ecology means that they are able to prosper in suburban and intensively farmed landscapes, which is likely to have allowed populations to reach a historically high equilibrium level.

Change factor	Primary driver	Secondary driver
Demographic	Change in breeding success	
Ecological	Unknown	

Further information on causes of change

Although there is little evidence directly supporting this, it is likely that the stabilisation in Magpie numbers reflects the population reaching carrying capacity in the intensively farmed and modern suburban landscapes. The fact that recent stability or decline is associated with parallel trends in fledglings per breeding attempt supports this. Demographic data presented here show that the number of fledglings per breeding attempt increased dramatically up until the 1990s but then stabilised (see above). Although clutch and brood sizes have declined over the whole time series (1968-2009), there have also been decreases in the failure of nests at the egg and chick stages (see above). A strong trend towards earlier laying has also been identified and may be partly explained by recent climate change (Crick & Sparks 1999).

The historical increases in Magpies have occurred at the same time as falling levels of control by gamekeepers from the time of the First World War (Tapper 1992), but there is no direct evidence for a causal link. Since 1990, the widespread adoption of the Larsen trap for predator control has been responsible for a large increase in Magpie numbers killed on shooting estates (GWCT data), and this could have played a role in stabilising population growth in some areas, but is unlikely to explain population change in towns and cities and is inconsistent with the observed changes in breeding success.

Magpies have increased in farmland and woodland habitats, with the largest population growth on mixed and pastoral farms, and the smallest on arable land (Gregory & Marchant 1996). The remarkable adaptability of Magpies has enabled them to colonise many new urban and suburban localities since the 1960s.

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S.,

Jay

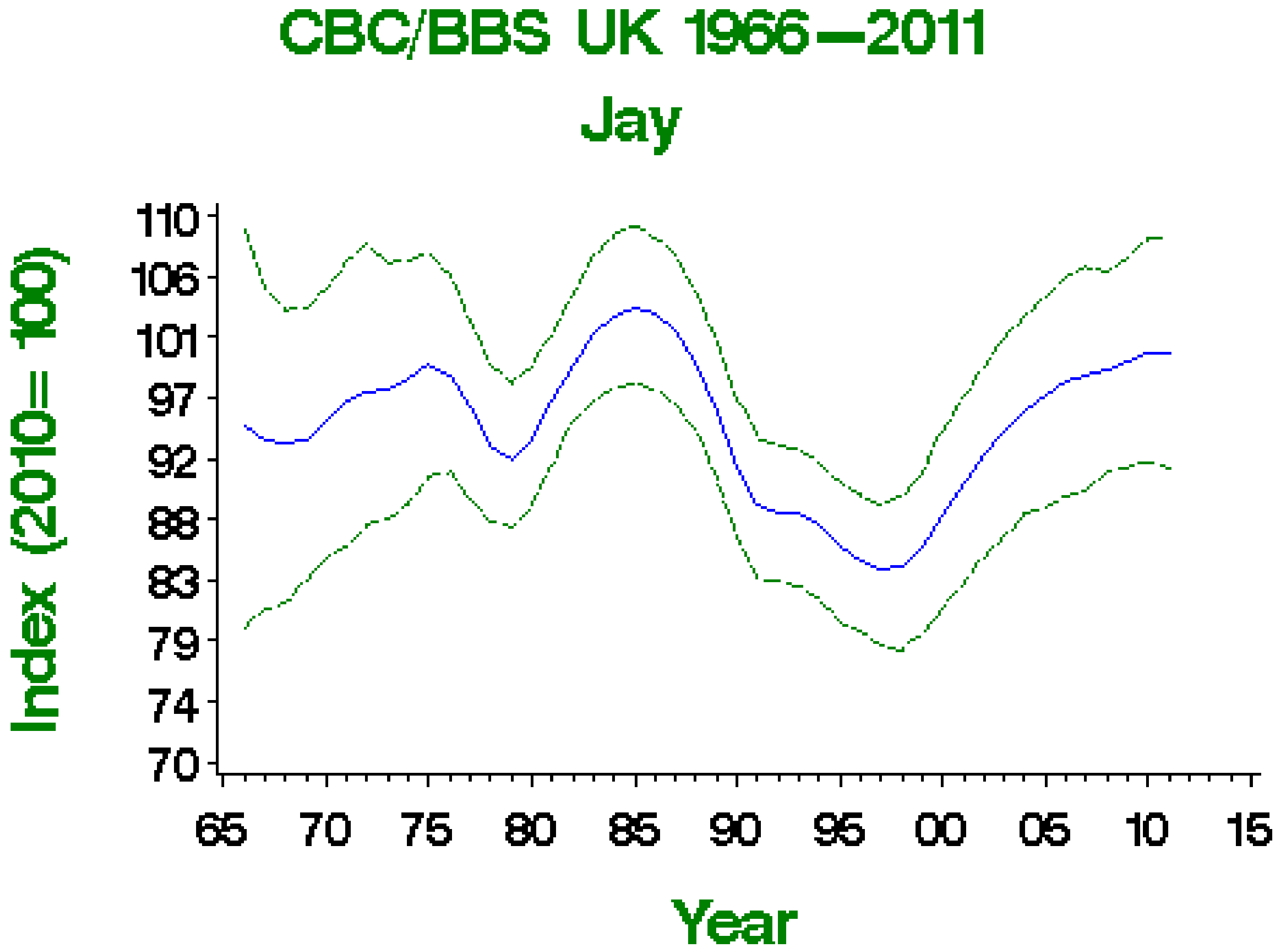
Garrulus glandarius

Key facts

Conservation listings:	Europe: no SPEC category (not concentrated in Europe, conservation status favourable) (BiE04) UK: green (species level); amber (races hibernicus and rufitergum, >20% of European breeders) (BoCC3)
Long-term trend:	UK, England: fluctuating, with no long-term trend
Population size:	170,000 territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Status summary

The UK Jay population remained stable in the species' preferred woodland habitat until the late 1980s, after which the population began to decline. This decrease followed an earlier decline on farmland CBC plots (Gregory & Marchant 1996). Long-term trends are stable overall, with losses since the 1980s now regained. The BBS PECBMS 2012a).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

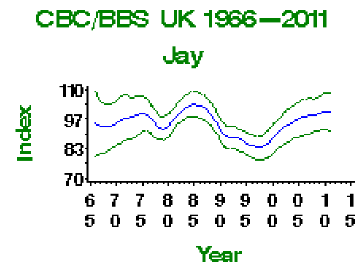
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	352	7	-13	35		
	25	1985-2010	528	-3	-14	11		
	10	2000-2010	854	14	7	21		
	5	2005-2010	970	3	-3	11		
CBC/BBS England	43	1967-2010	311	0	-21	32		
	25	1985-2010	462	-9	-20	5		

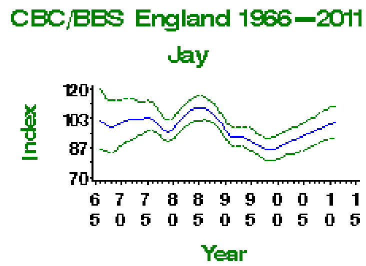
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	10	2000-2010	739	15	7	23		
	5	2005-2010	842	7	1	13		
BBS UK	15	1995-2010	732	15	7	23		
	10	2000-2010	846	14	8	21		
	5	2005-2010	970	3	-3	9		
BBS England	15	1995-2010	631	8	1	16		
	10	2000-2010	724	15	9	23		
	5	2005-2010	832	6	2	11		
BBS Wales	15	1995-2010	70	40	9	72		
	10	2000-2010	81	15	-3	38		
	5	2005-2010	87	5	-7	24		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

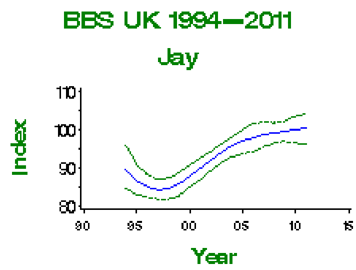
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



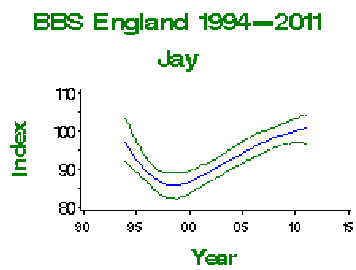
CBC/BBS UK graph



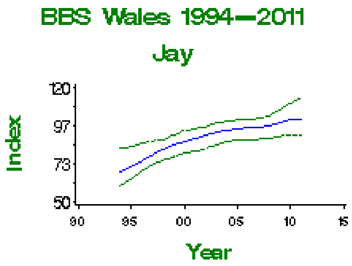
CBC/BBS England graph



BBS UK graph



BBS England graph

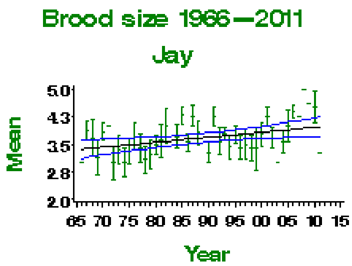


BBS Wales graph

Demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Brood size	42	1968-2010	11	Linear increase	3.39 chicks	3.96 chicks	16.7%		Small sample

For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Jackdaw

Coloeus monedula

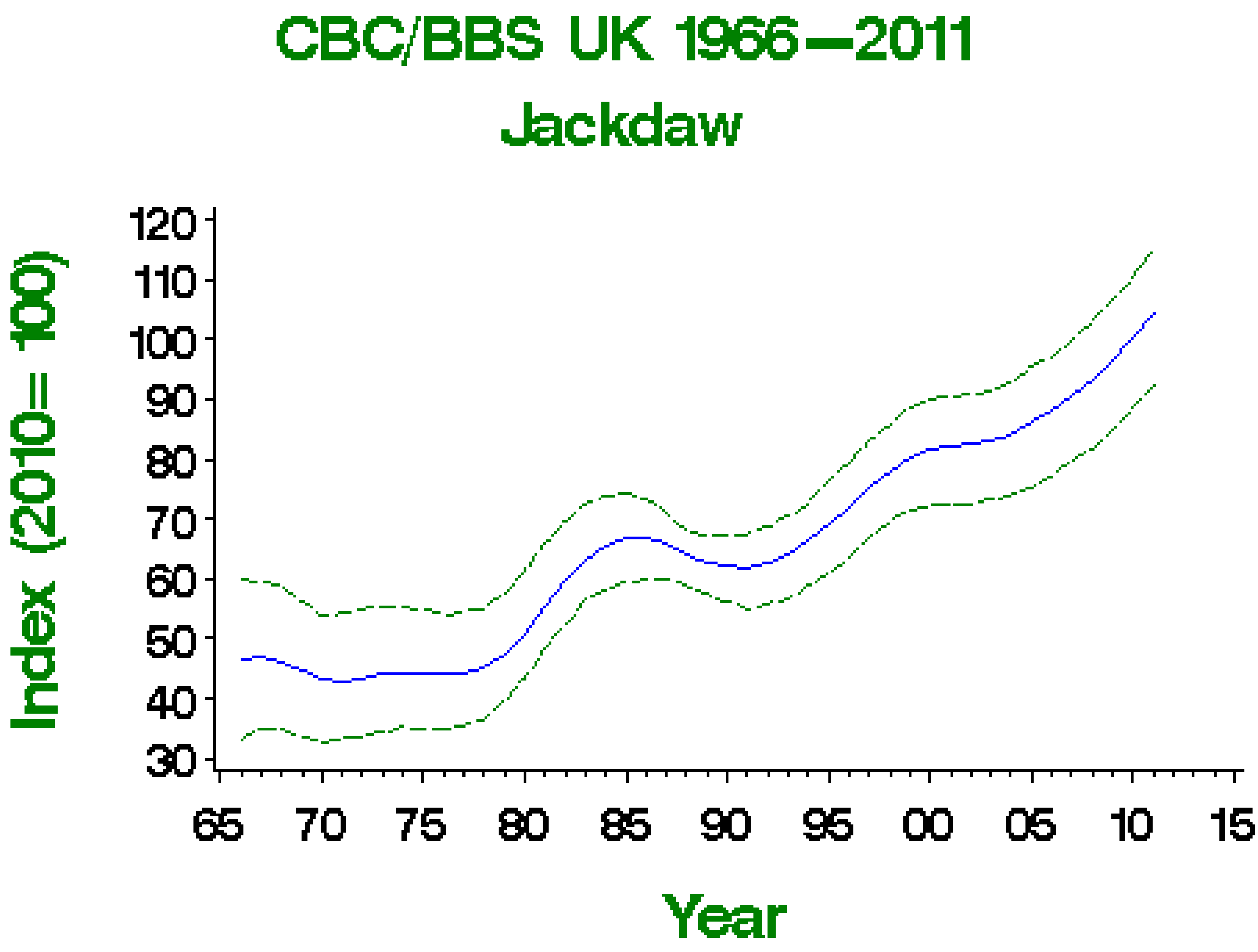
Key facts

Conservation listings:	Europe: no SPEC category (concentrated in Europe, conservation status favourable) (BiE04) UK: green (BoCC3)
Long-term trend:	UK: rapid increase England: moderate increase
Population size:	1.4 (1.2-1.5) million pairs in 2009 (APEP13: distance sampling estimate for 2006 (Newson et al. 2008) updated using BBS trend)

Migrant status:	Resident
Nesting habitat:	Cavity nester
Primary breeding habitat:	Farmland
Secondary breeding habitat:	
Breeding diet:	Animal
Winter diet:	Animal

Status summary

Jackdaws have increased in abundance since the 1960s (Gregory & Marchant 1996), and more recent BBS data suggest that the increase is continuing in all UK countries. The BBS PECBMS 2012a).



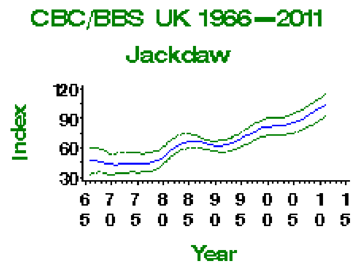
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

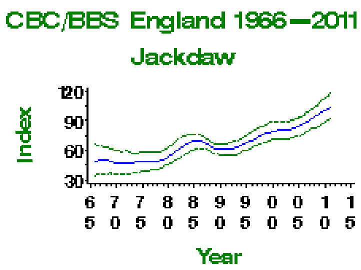
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	656	114	49	264		
	25	1985-2010	1079	50	19	88		
	10	2000-2010	1885	22	16	29		
	5	2005-2010	2163	16	10	22		
CBC/BBS England	43	1967-2010	525	101	29	216		
	25	1985-2010	863	44	17	83		
	10	2000-2010	1508	26	18	35		
	5	2005-2010	1749	19	15	25		
BBS UK	15	1995-2010	1631	44	34	58		
	10	2000-2010	1844	25	16	32		
	5	2005-2010	2106	17	11	22		
BBS England	15	1995-2010	1303	49	39	58		
	10	2000-2010	1477	28	20	37		
	5	2005-2010	1705	19	13	24		
BBS Scotland	15	1995-2010	111	29	2	57		
	10	2000-2010	120	17	-2	46		
	5	2005-2010	138	24	6	45		
BBS Wales	15	1995-2010	138	31	-6	86		
	10	2000-2010	156	10	-9	27		
	5	2005-2010	164	-3	-21	15		
BBS N.Ireland	15	1995-2010	74	87	31	122		
	10	2000-2010	87	35	11	58		
	5	2005-2010	95	29	10	50		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

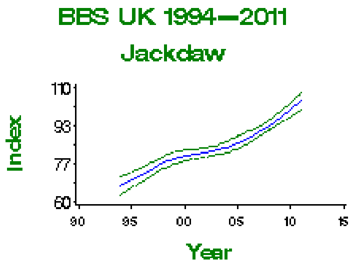
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



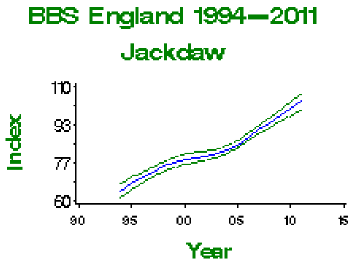
CBC/BBS UK graph



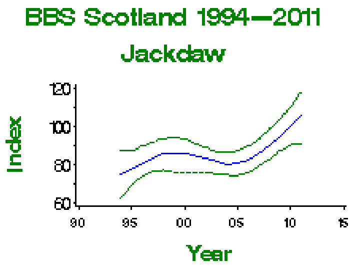
CBC/BBS England graph



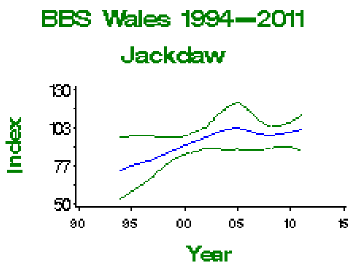
BBS UK graph



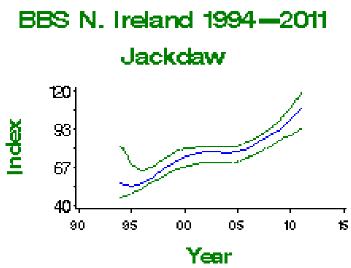
BBS England graph



BBS Scotland graph

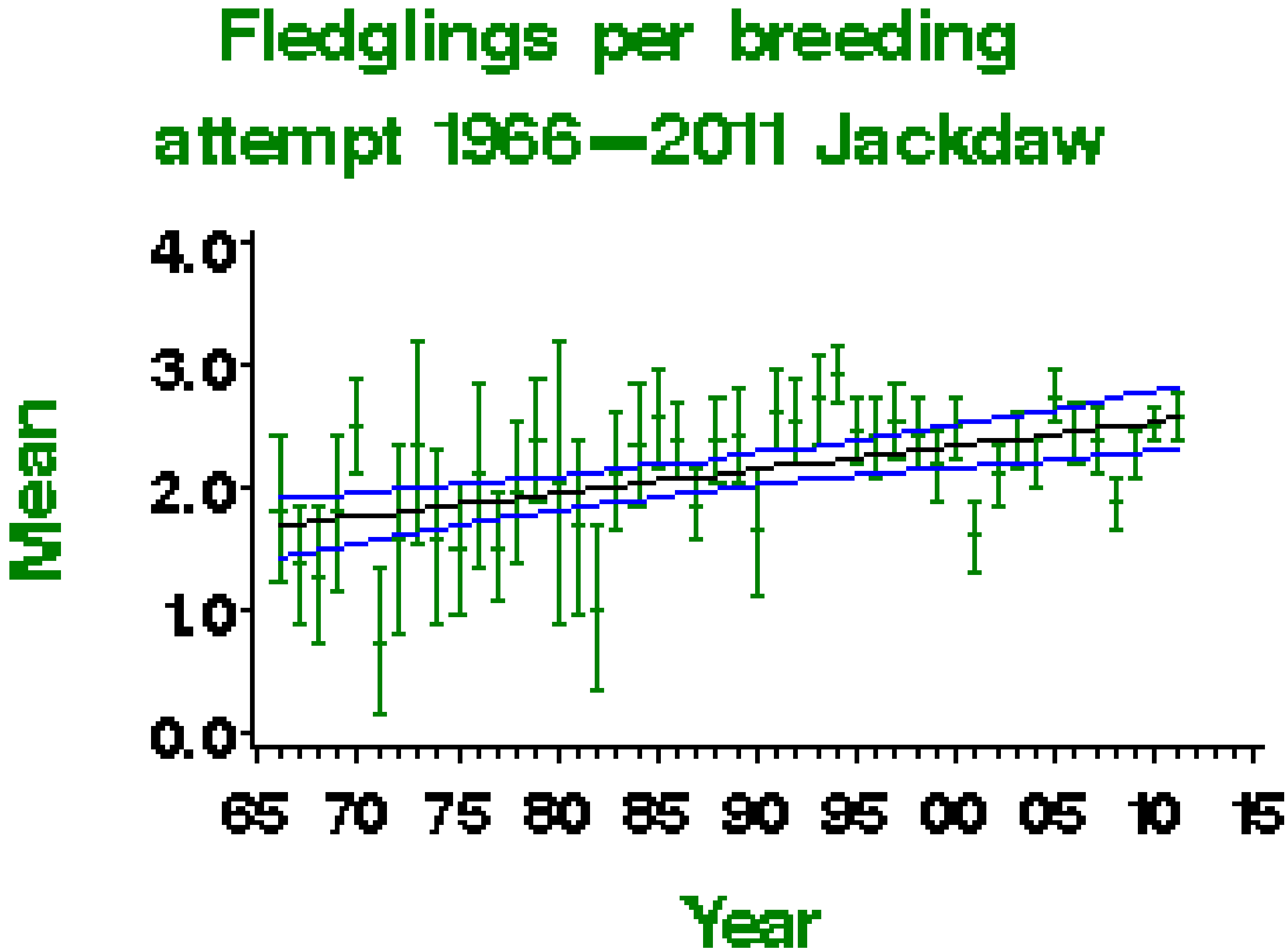


BBS Wales graph

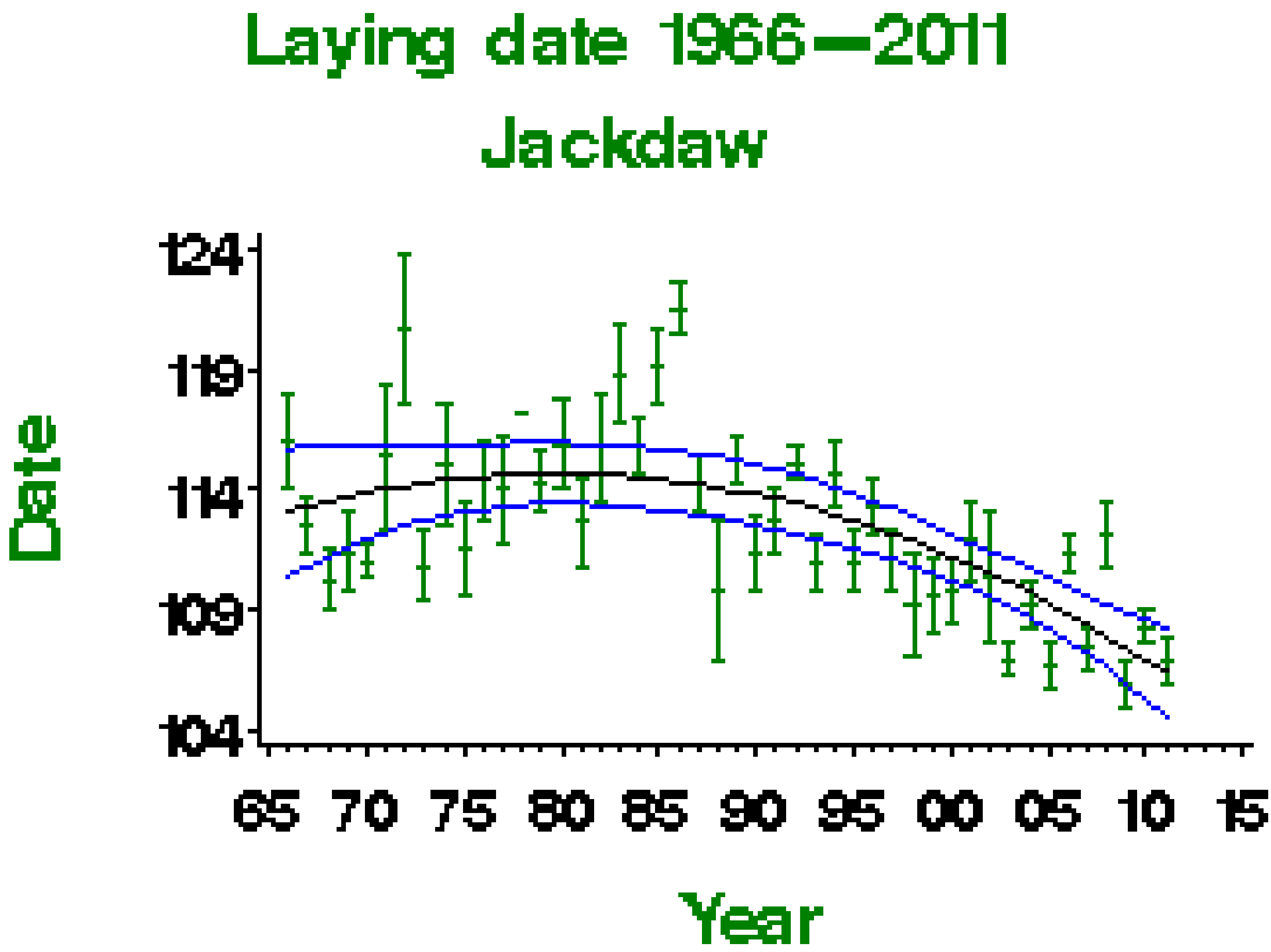


BBS N.Ireland graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

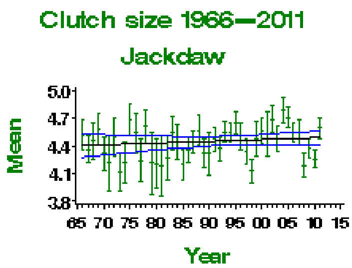


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

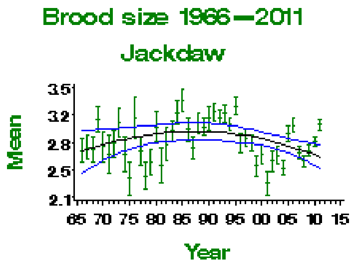
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	54	Linear increase	1.73 fledglings	2.56 fledglings	47.9%		
Clutch size	42	1968-2010	49	None					
Brood size	42	1968-2010	111	Curvilinear	2.73 chicks	2.65 chicks	-3.1%		
Nest failure rate at egg stage	42	1968-2010	61	Linear decline	0.71% nests/day	0.19% nests/day	-73.2%		
Nest failure rate at chick stage	42	1968-2010	58	Linear decline	1.15% nests/day	0.23% nests/day	-80.0%		
Laying date	42	1968-2010	27	Curvilinear	Apr 23	Apr 17	-6 days		Small sample

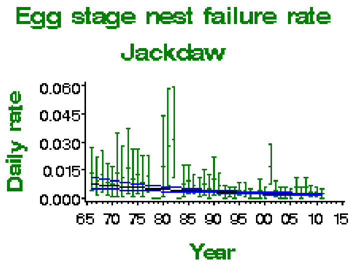
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



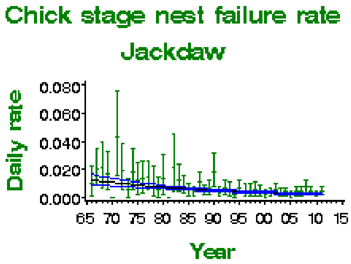
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

Causes of change

There is no evidence available regarding the ecological causes of increase for this species but changes have been associated with improvements in breeding performance, probably due to increased food availability.

Change factor	Primary driver	Secondary driver
Demographic	Increased breeding success	
Ecological	Unknown	

Further information on causes of change

As with Magpie, Rook and Carrion Crow, the increase has been associated with improvements in breeding performance and probably reflects the species' generalist feeding habits, which allow it to exploit diverse and ephemeral food resources, although direct evidence for this is limited. A minor decrease in average brood size (see above) has been countered by substantial declines in nest failure rates during the egg and chick stages, and the number of fledglings per breeding attempt has improved steadily. Laying dates have advanced.

Typically in this species, the younger chicks of a brood perish quickly if food becomes limited. Henderson & Hart (1993) provided evidence that increases in fledging success are likely to be due to improved provisioning by the parents. Most of the variation in annual reproductive output was caused by nestling mortality rather than clutch size or hatching success. Soler & Soler (1996) used data from Spain to show that additional food advanced the laying date, increased the clutch size, independently of laying date, and increased fledging success.

Changes in the landscape may have also benefited this species. Gregory & Marchant (1996) found an increase in Jackdaw numbers in agricultural habitats, particularly in the south-west, but an overall decrease in forests. These increases were associated with trends in cultivation and population gains have been most pronounced on grazing farms and in the north and south-west where such farms predominate. A similar pattern was found in Sweden by Andren (1992), who provided evidence that the density of Jackdaws increased as forest became fragmented and intermixed with agricultural land.

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO,

Thetford. https://www.bto.org/birdtrends

Rook

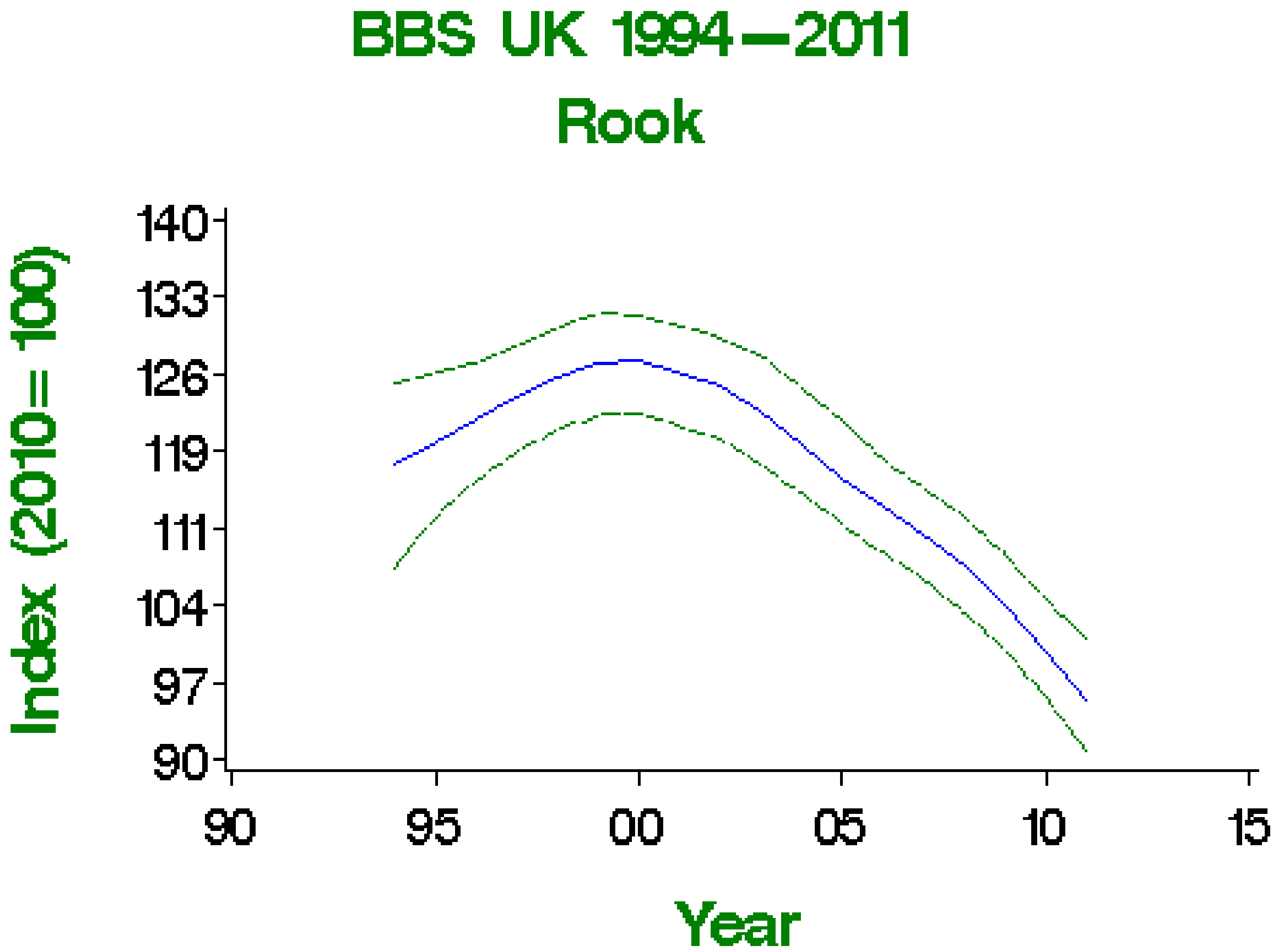
Corvus frugilegus

Key facts

Conservation listings:	Europe: no SPEC category (not concentrated in Europe, conservation status favourable) (BiE04) UK: green (BoCC3)
Long-term trend:	UK: increase
Population size:	1.1 (1.0-1.2) million pairs in 2009 (APEP13: 1996 estimate (Marchant & Gregory 1999) updated using BBS trend)

Status summary

Relatively few rookeries fell within CBC plots, but an index calculated from the available nest counts showed a shallow, long-term increase (Wilson et al. 1998). The trend is confirmed by the results of the most recent BTO rookeries survey, which identified a 40% increase in abundance between 1975 and 1996 (Marchant & Gregory 1999). This increase probably reflects the species'' considerable adaptability in the face of agricultural change. BBS indices, which are drawn from sightings during transect walks and not from the BBS''s nest counts, suggest that some decrease has occurred subsequently, especially in Scotland and Northern Ireland since around 2000. The BBS PECBMS 2012a).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	15	1995-2010	1264	-16	-23	-7		
	10	2000-2010	1373	-21	-27	-15		
	5	2005-2010	1538	-14	-19	-8		
BBS England	15	1995-2010	1001	-8	-17	1		

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS Scotland	15	1995-2010	109	-35	-48	-17	>25	
	10	2000-2010	112	-37	-51	-18	>25	
	5	2005-2010	124	-30	-43	-15	>25	
BBS Wales	15	1995-2010	78	-16	-38	14		
	10	2000-2010	85	-9	-32	23		
	5	2005-2010	87	4	-16	34		
BBS N.Ireland	15	1995-2010	74	-5	-33	27		
	10	2000-2010	87	-43	-55	-28	>25	
	5	2005-2010	92	-20	-38	-5		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

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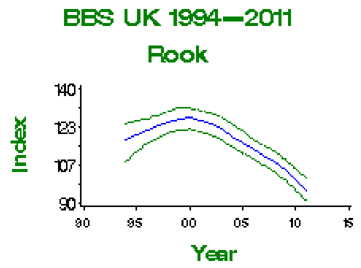
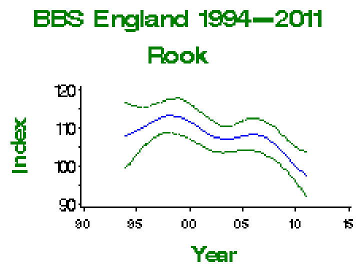
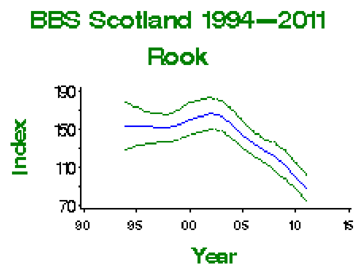


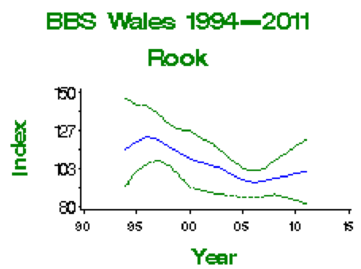
BBS UK graph



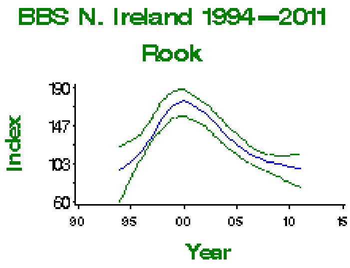
BBS England graph



BBS Scotland graph



BBS Wales graph

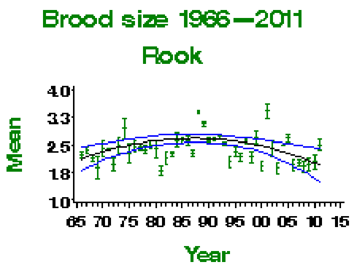


BBS N.Ireland graph

Demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Clutch size	42	1968-2010	11	None					Small sample
Brood size	42	1968-2010	81	Curvilinear	2.21 chicks	2.01 chicks	-9.0%		
Nest failure rate at egg stage	42	1968-2010	30	None					
Nest failure rate at chick stage	42	1968-2010	47	None					
Laying date	42	1968-2010	13	None			0 days		Small sample

For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Carrion Crow

Corvus corone

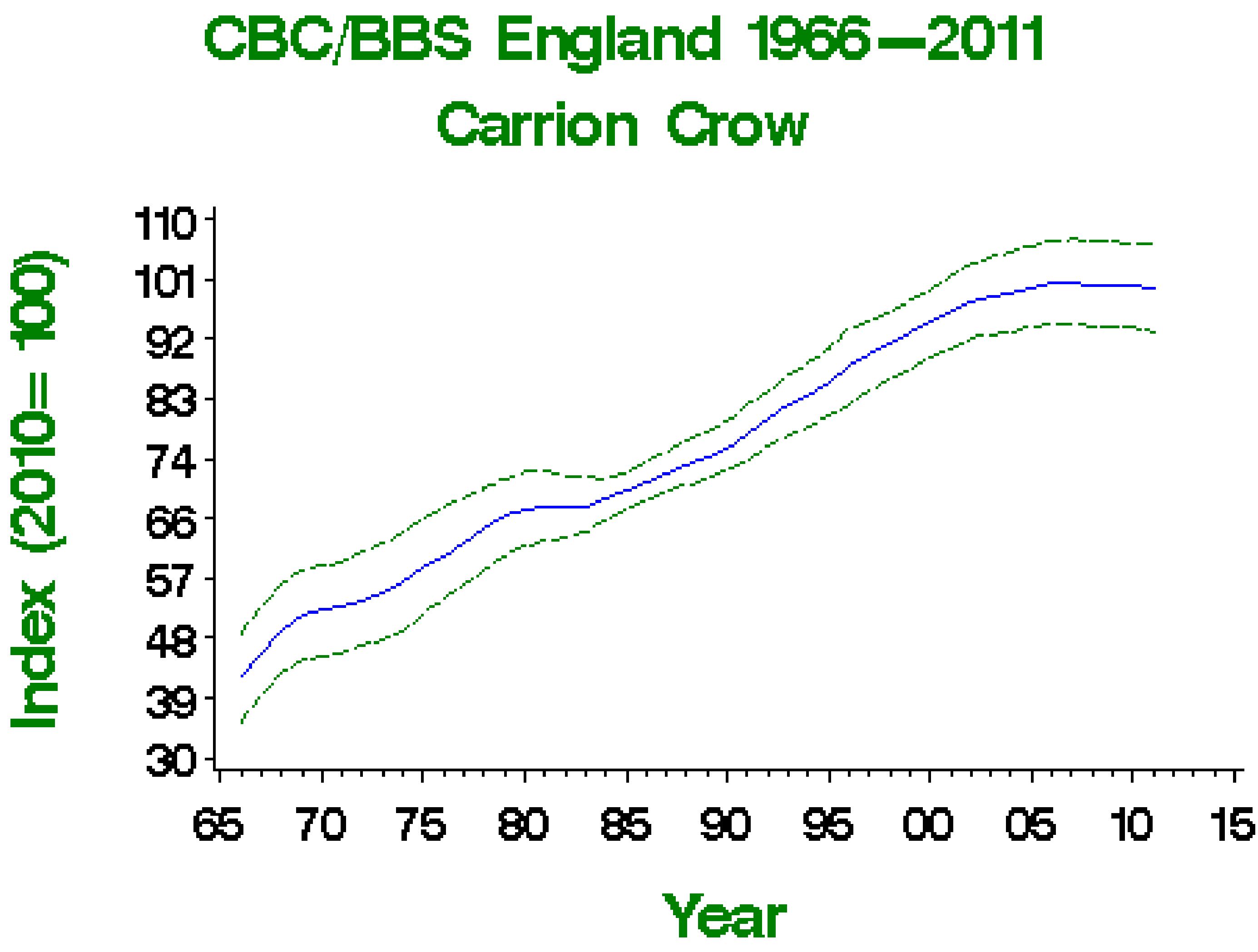
Key facts

Conservation listings:	Europe (C. corone/cornix): no SPEC category (not concentrated in Europe, conservation status favourable) (BiE04) UK (C. corone/cornix): green (BoCC3)
Long-term trend:	England: rapid increase
Population size:	1.0 million territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend for England)

Migrant status:	Resident
Nesting habitat:	Above-ground nester
Primary breeding habitat:	?
Secondary breeding habitat:	
Breeding diet:	Animal
Winter diet:	Animal

Status summary

Carrion Crows have increased steadily since the 1960s (Gregory & Marchant 1996) and only since 2002 are there signs of the UK population size stabilising. The BBS map of change in relative density between 1994-96 and 2007-09 indicates that, despite strong increase in southeastern England and much of Scotland, there have been sharp decreases in southwestern England, Wales, upland England and northeastern Scotland. Since 1968, breeding productivity has increased steeply and laying date has advanced by almost a fortnight.



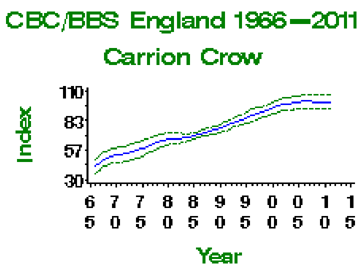
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

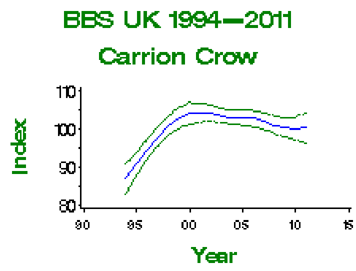
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	43	1967-2010	799	119	78	177		Includes Hooded Crow
	25	1985-2010	1273	44	30	59		Includes Hooded Crow
	10	2000-2010	2140	5	1	11		Includes Hooded Crow
	5	2005-2010	2458	0	-3	4		
BBS UK	15	1995-2010	2266	10	4	17		
	10	2000-2010	2519	-4	-9	1		
	5	2005-2010	2855	-3	-7	1		
BBS England	15	1995-2010	1870	17	10	25		
	10	2000-2010	2082	4	-1	9		
	5	2005-2010	2381	0	-3	3		
BBS Scotland	15	1995-2010	182	-6	-25	18		
	10	2000-2010	195	-19	-33	-1		
	5	2005-2010	221	-7	-17	6		
BBS Wales	15	1995-2010	201	2	-12	16		
	10	2000-2010	226	-13	-23	-1		
	5	2005-2010	237	-10	-21	1		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

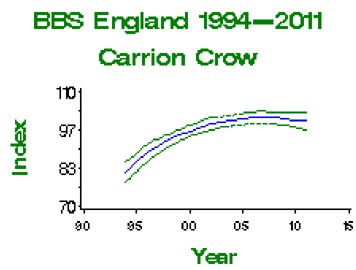
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



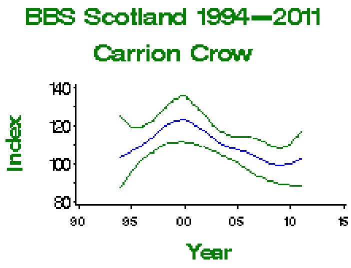
CBC/BBS England graph



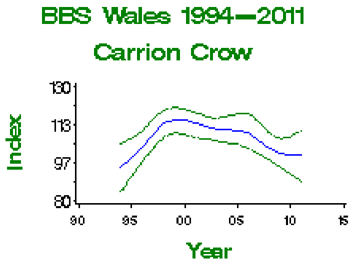
BBS UK graph



BBS England graph

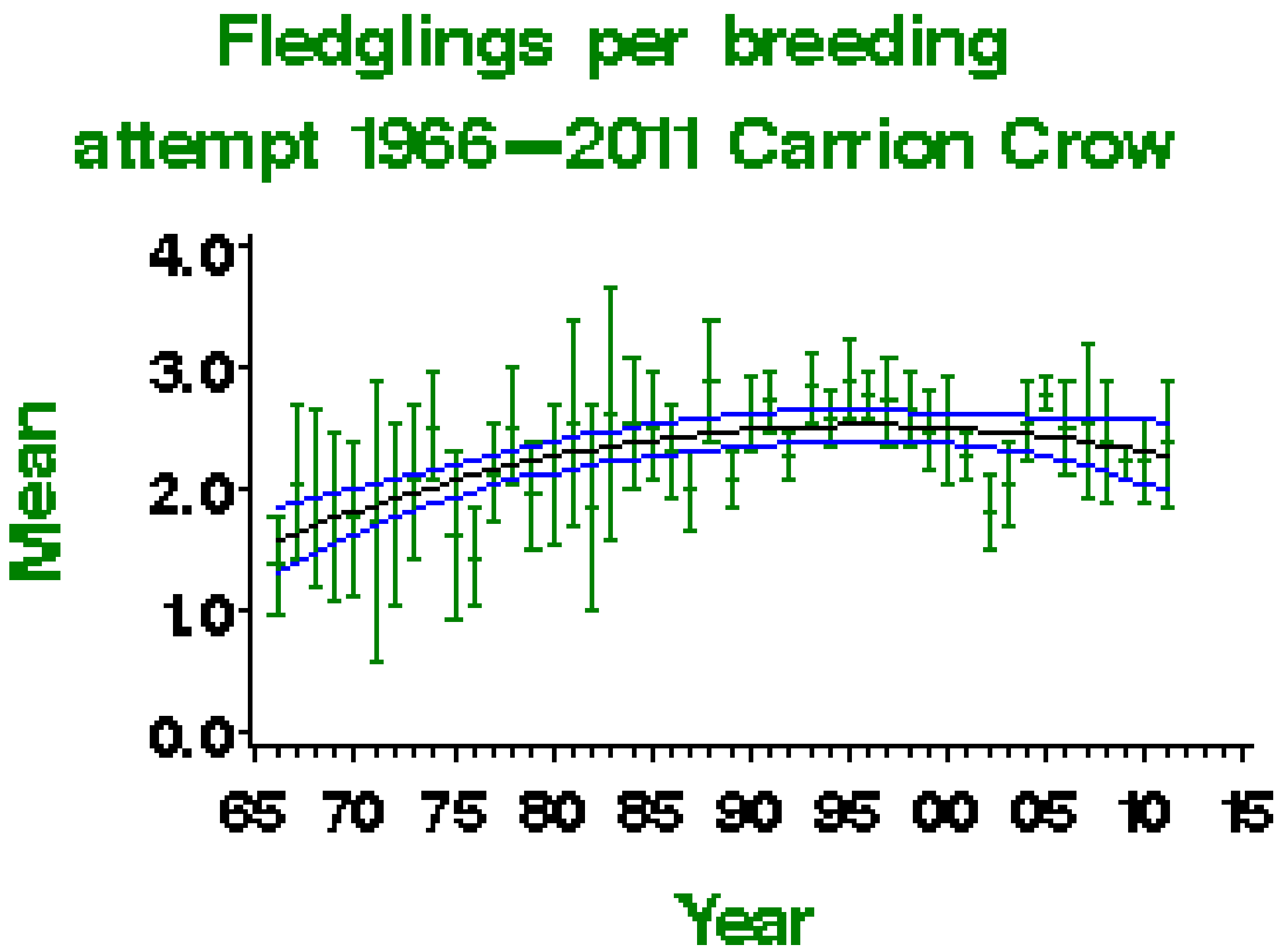


BBS Scotland graph

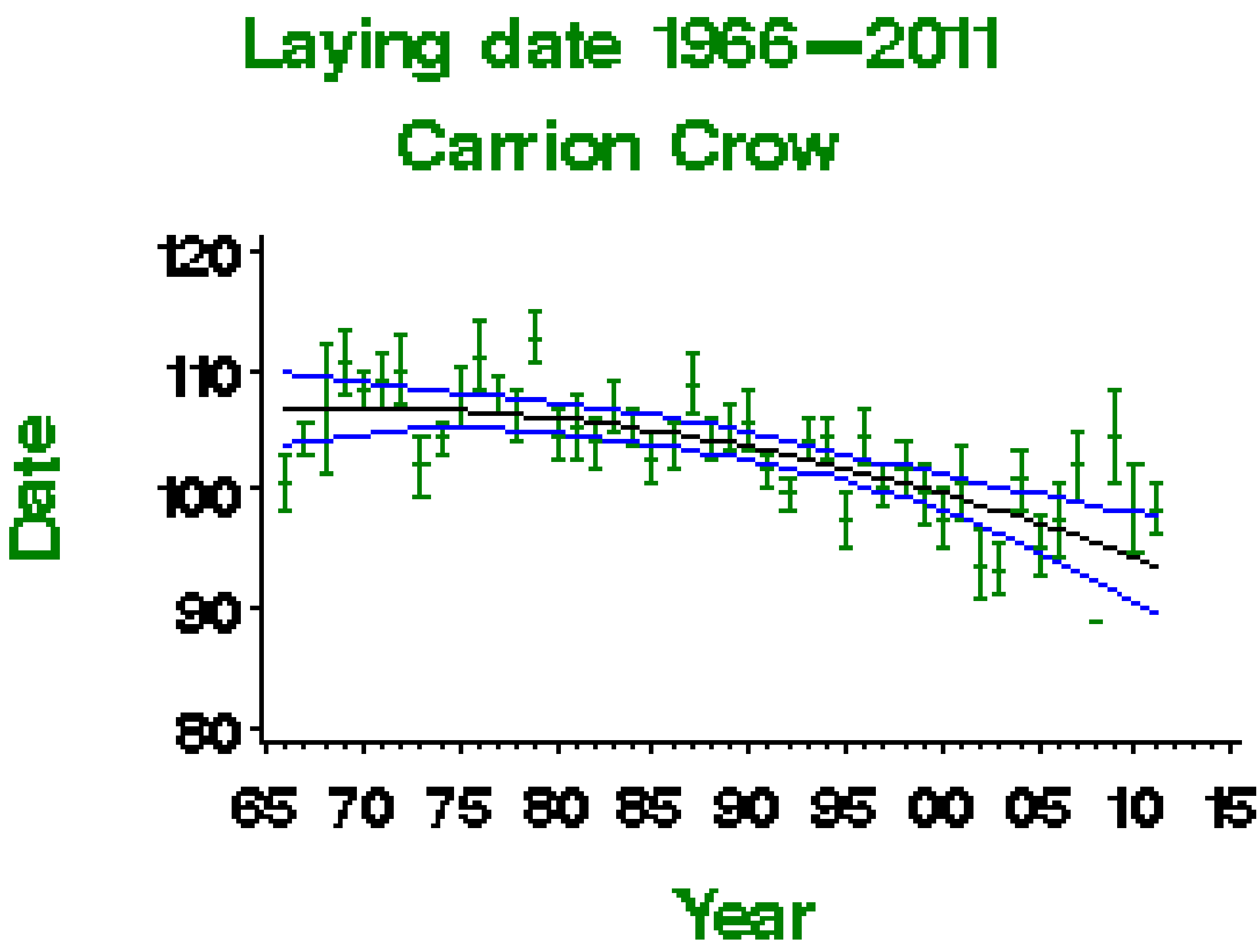


BBS Wales graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

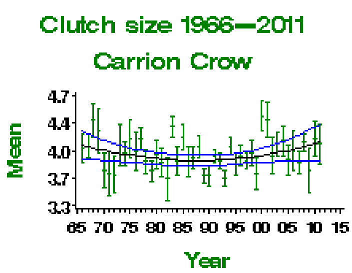


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

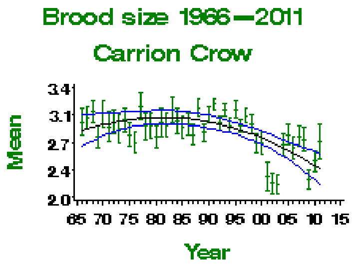
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	39	Curvilinear	1.71 fledglings	2.32 fledglings	35.5%		
Clutch size	42	1968-2010	31	Curvilinear	4.04 eggs	4.09 eggs	1.2%		
Brood size	42	1968-2010	78	Curvilinear	2.89 chicks	2.40 chicks	-16.8%		
Nest failure rate at egg stage	42	1968-2010	47	Linear decline	1.74% nests/day	0.13% nests/day	-92.5%		
Nest failure rate at chick stage	42	1968-2010	41	Linear decline	0.77% nests/day	0.10% nests/day	-87.0%		
Laying date	42	1968-2010	29	Curvilinear	Apr 17	Apr 4	-13 days		Small sample

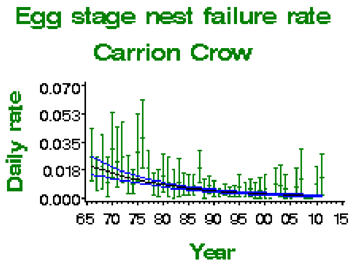
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



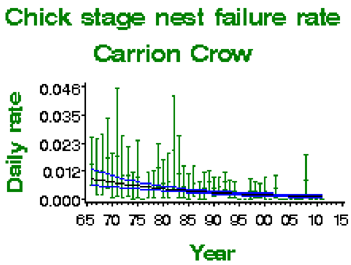
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

Causes of change

There are few specific studies providing evidence for the causes of the increase in this species, although evidence presented here shows that increases in breeding success have been important. Ecological causes of this could be increases in food availability and the increasing suitability of urban areas (driving the species' expansion there), although specific evidence supporting these hypotheses is limited.

Change factor	Primary driver	Secondary driver
Demographic	Increased breeding success	
Ecological	Other	

Further information on causes of change

The demographic trends shown here reveal that there has been a linear increase in the number of fledglings produced per breeding attempt between 1968 and 2008, reflecting a linear decline in daily failure rate of nests at the egg and chick stage. Clutch size has increased, but brood size has decreased. Thus this suggests that the increase in Carrion Crow numbers is related to increases in breeding success, although as there are no estimates of survival, it is not possible to say whether this has also increased.

This species is omnivorous and highly adaptable and is thus able to exploit changing habitats and the ephemeral food resources in intensive agriculture, from ploughed fields to grazed pasture, allowing breeding pairs to hold year-round territories. It is also able to exploit the varied food sources found in towns and cities. Richner (1992) provided good evidence that food-supplemented pairs had a higher nesting success and produced more and heavier fledglings, demonstrating that food limitation can cause low fitness for individuals and thus could potentially restrict population-level reproductive success. In a local study, Yom-Tov (1974) showed that provision of excess food improved chick survival, and concluded that the distribution pattern of food was the ultimate factor limiting breeding success, perhaps because this affects levels of intraspecific nest predation. Although the impact on population size was not considered in these studies, it is possible that food availability for Carrion Crows has increased and so helped the support the population increase. O'Connor & Shrubb (1986) suggest that the general increase in density of sheep in upland areas, and the increase in carrion resulting from this, may be responsible for the expansion of Carrion Crow populations, although evidence for this was not given and this is clearly not relevant to lowland areas (where sheep numbers have decreased).

A second hypothesis to explain this species' increase is that control by gamekeepers has reduced, but evidence supporting this is limited. Tharme et al. (2001) stated that the control of Carrion Crows by gamekeepers was the most probable cause of the low densities on grouse moors, although they found no significant relationship between the number of gamekeepers and Carrion Crow density. Furthermore, bag returns have shown no overall change in the number of Carrion Crows killed since 1961 (Tapper 1992, Tapper & France 1992).

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Hooded Crow

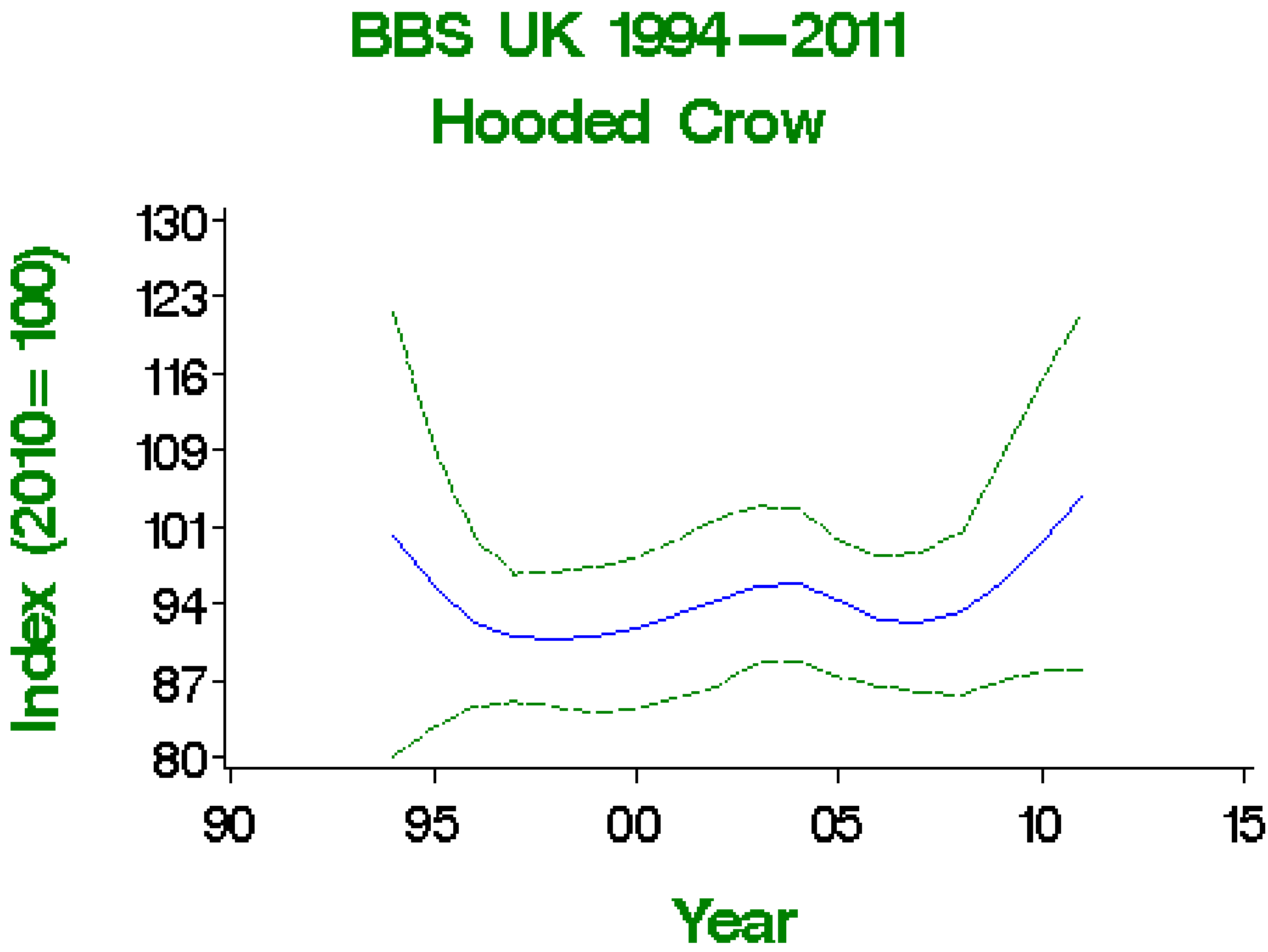
Corvus cornix

Key facts

Conservation listings:	Europe (C. corone/cornix): no SPEC category (not concentrated in Europe, conservation status favourable) (BiE04) UK: green (BoCC3)
Long-term trend:	UK: uncertain
Population size:	260,000 territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Status summary

The BOU Records Committee took the decision in 2002 to treat Hooded Crow and Parkin et al. 2003). This split is not yet recognised in European conservation listings. In the UK, Hooded Crows occur in Northern Ireland, the Isle of Man, and in Scotland, mainly west and north of the Great Glen. Retrospective analysis of BBS trends is simple because observers record Hooded Crows (coded HC) separately from Carrion Crows and from intermediates (coded HB). Intermediate forms between Carrion and Hooded, which predominate in a band across western Scotland and occur less frequently elsewhere in the UK, are not included in either BBS index. BBS data suggest that some decrease in Hooded Crows may have occurred in Scotland, but that this has been countered by increase in Northern Ireland. Hooded Crows have increased markedly in Ireland since 1924 (Hutchinson 1989).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

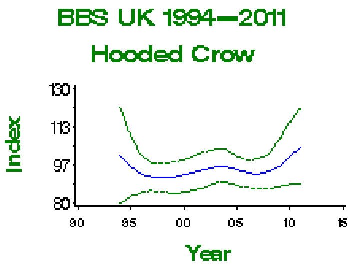
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	15	1995-2010	134	4	-18	41		
	10	2000-2010	145	9	-11	34		
	5	2005-2010	154	6	-11	30		
BBS Scotland	15	1995-2010	50	-21	-47	22		

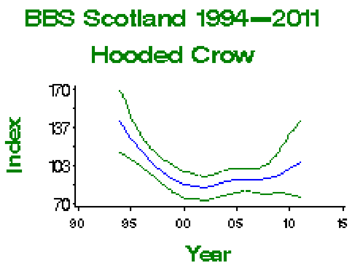
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	10	2000-2010	47	08	-24	76		
	5	2005-2010	51	10	-19	59		
BBS N.Ireland	15	1995-2010	80	108	55	152		
	10	2000-2010	95	0	-14	14		
	5	2005-2010	101	-1	-13	11		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

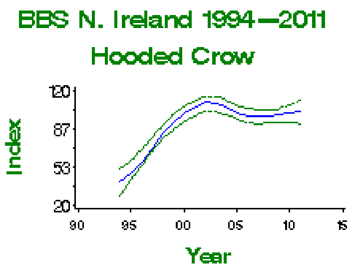
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



BBS UK graph



BBS Scotland graph



BBS N.Ireland graph

Demographic trends

Productivity and survival trends for this species are not currently produced by BTO

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Raven

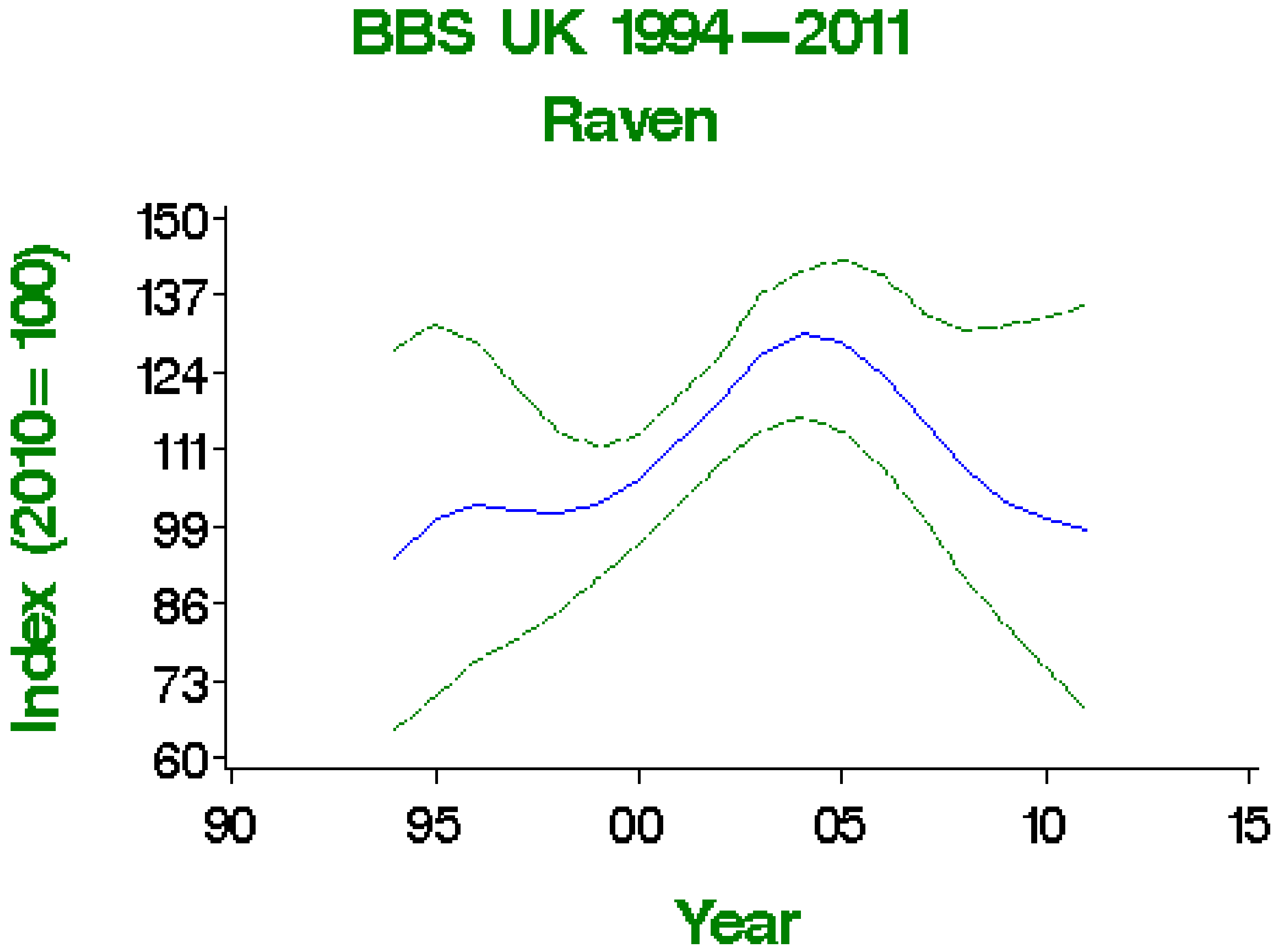
Corvus corax

Key facts

Conservation listings:	Europe: no SPEC category (not concentrated in Europe, conservation status favourable) (BiE04) UK: green (BoCC3)
Long-term trend:	UK: increase
Population size:	7,400 pairs in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Status summary

Between the 1968-72 and 1988-91 atlas periods, the Raven's range contracted from some areas of Scotland and northern England. Declines in southern Scotland and northern England were associated with large-scale afforestation (Marquiss et al. 1978), while closer sheep husbandry and conversion of pasture to arable were also implicated (Mearns 1983). A thorough survey of northwest Wales during 1998 to 2005 found at least 69% more nesting pairs than a previous survey of the same area during 1978-85 and evidence of an increase of 173% since around 1950, at a rate that accelerated after 1990 (Driver 2006). Ravens have also increased along the English-Welsh border and colonised new parts of lowland England, helping to balance the local declines in northern Britain (Cross 2002). BBS indicates steep increase in England, Scotland and Wales since 1994. Nesting success appears to have improved, but brood size has fallen. No trend is evident in the number of fledglings per breeding attempt. Ravens have increased markedly across Europe since 1980, though with little change since 1990 (PECBMS 2012a): increases are evident in all regions but are weakest in the south and west, including UK (PECBMS 2009).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	15	1995-2010	273	0	-44	97		
	10	2000-2010	328	-6	-33	38		

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	5	2005-2010	394	-23	-46	9		
BBS England	15	1995-2010	114	-32	-70	233		
	10	2000-2010	149	-9	-54	134		
	5	2005-2010	198	-39	-65	29		
BBS Scotland	15	1995-2010	43	59	-1	134		
	10	2000-2010	44	54	1	133		
	5	2005-2010	51	13	-31	74		
BBS Wales	15	1995-2010	87	22	-22	86		
	10	2000-2010	101	-9	-31	14		
	5	2005-2010	107	-24	-45	-4		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

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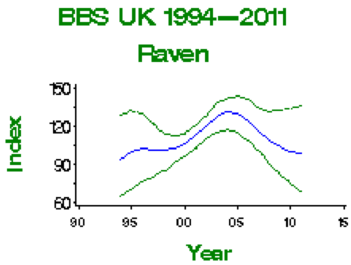
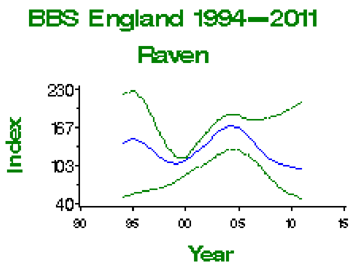
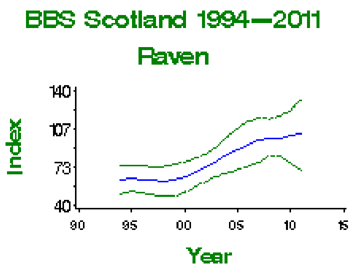


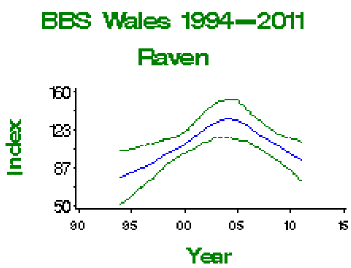
BBS UK graph



BBS England graph

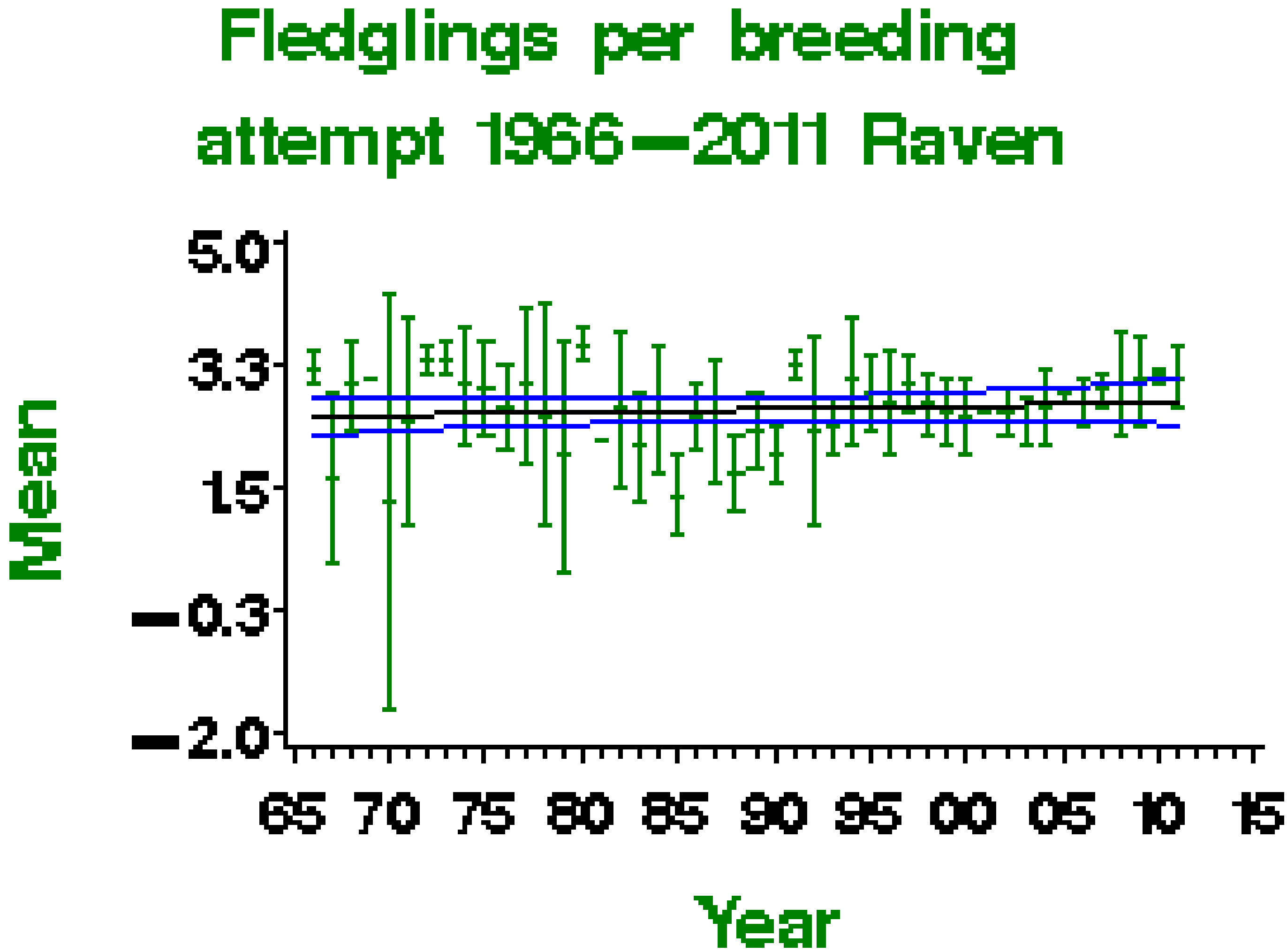


BBS Scotland graph

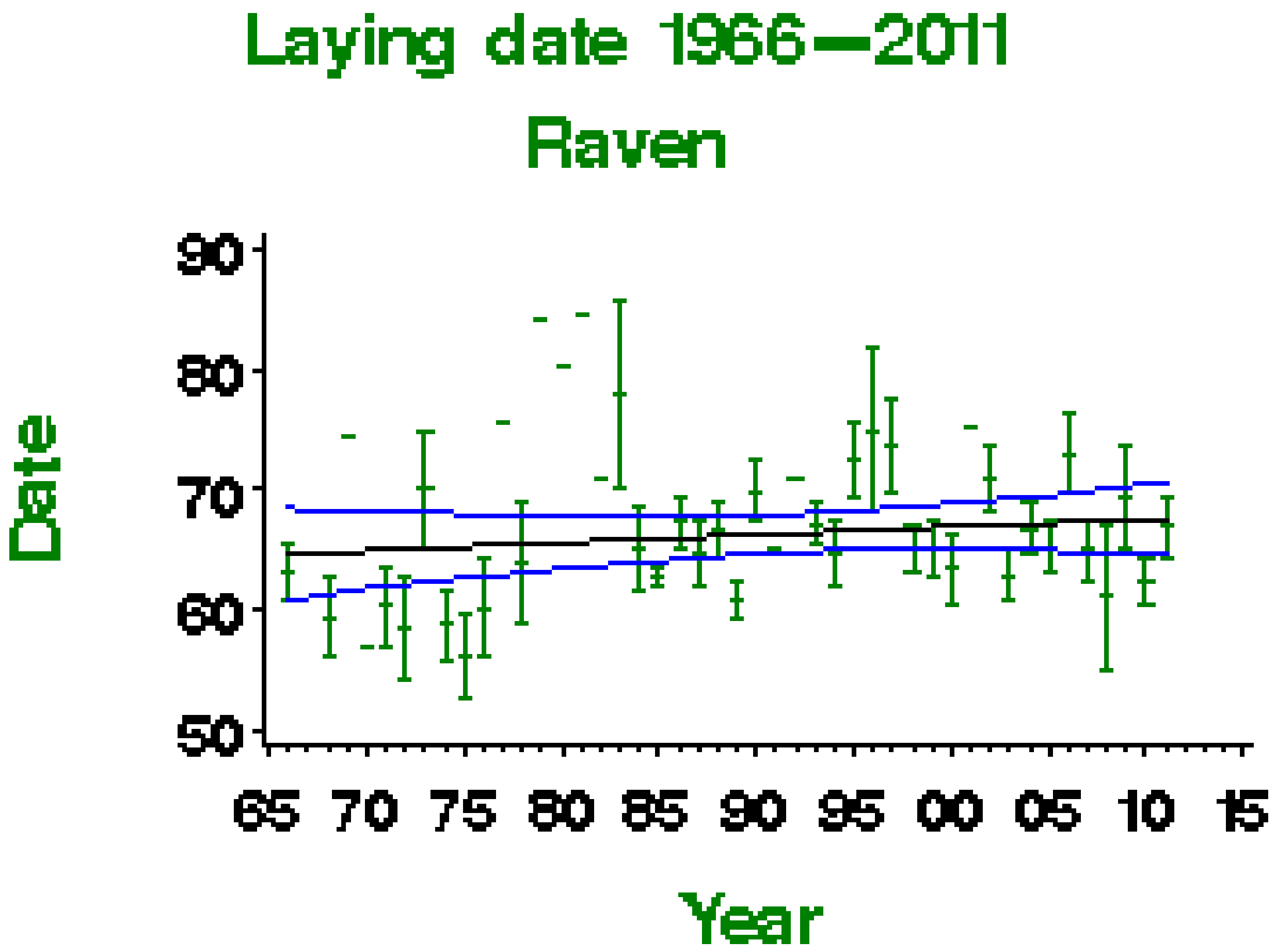


BBS Wales graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend



Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

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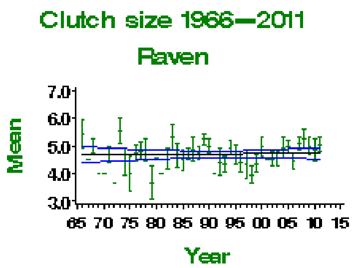
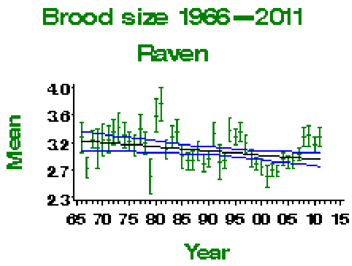
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	22	None					
Clutch size	42	1968-2010	14	None					Small sample
Brood size	42	1968-2010	69	Linear decline	3.16 chicks	2.89 chicks	-8.6%		
Nest failure rate at egg stage	42	1968-2010	22	Curvilinear	0.27% nests/day	0.05% nests/day	-81.5%		Small sample
Nest failure rate at chick stage	42	1968-2010	30	Curvilinear	0.03% nests/day	0.01% nests/day	-66.7%		Small sample
Laying date	42	1968-2010	11	None			0 days		Small sample

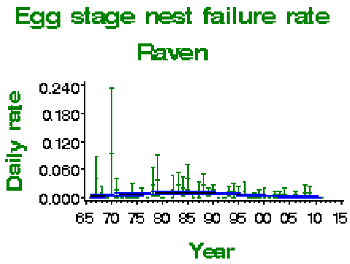
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



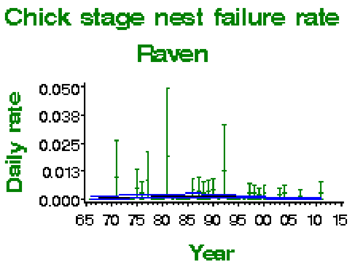
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

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Goldcrest

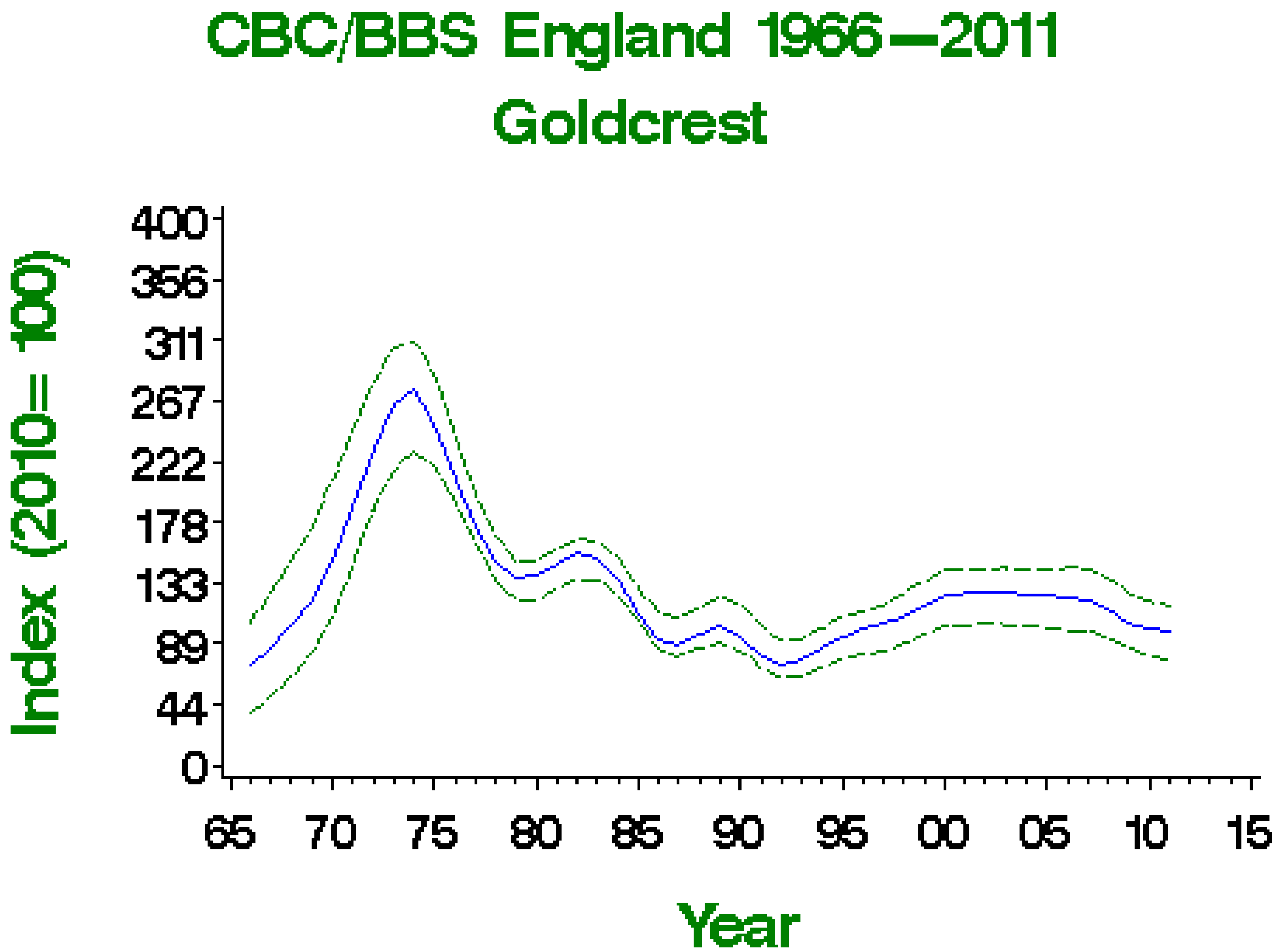
Regulus regulus

Key facts

Conservation listings:	Europe: no SPEC category (concentrated in Europe, conservation status favourable) (BiE04) UK: green (BoCC3)
Long-term trend:	England: fluctuating, with no long-term trend
Population size:	610,000 territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Status summary

Goldcrest abundance is unusually severely affected by winter weather, and the strong increase in the species' CBC/BBS index up to the mid 1970s can be interpreted as recovery from the cold winters of the early 1960s. The subsequent decline temporarily moved the species to the amber list, but its status has now been restored to green. The long-term trend looks very much like a series of damped oscillations following recovery from the 1962/63 winter. The high amplitude of year-to-year change reflects the species high breeding potential, and its sensitivity to cold winter weather. CBC had relatively poor coverage of conifer plantations, in which Goldcrests occur at increasing densities as the trees mature. A general increase in the area of prime habitat has therefore been poorly reflected in the long-term trend. BBS has recorded substantial decreases in Wales, and all UK countries show decline in the recent five-year period. The BBS PECBMS 2012a).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

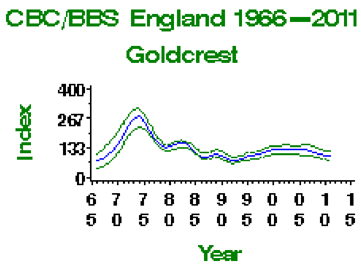
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	43	1967-2010	253	16	-34	158		
	25	1985-2010	376	-9	-35	7		
	10	2000-2010	635	-19	-27	-7		
	5	2005-2010	705	-20	-23	-12		

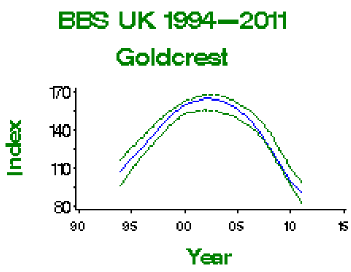
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	15	1995-2010	761	-15	-23	1		
	10	2000-2010	875	-37	-41	-27	>25	
	5	2005-2010	981	-36	-39	-27	>25	
BBS England	15	1995-2010	530	5	-6	21		
	10	2000-2010	616	-17	-23	-7		
	5	2005-2010	686	-19	-23	-12		
BBS Scotland	15	1995-2010	93	-14	-31	18		
	10	2000-2010	103	-51	-60	-37	>50	
	5	2005-2010	122	-53	-60	-41	>50	
BBS Wales	15	1995-2010	80	-51	-67	-28	>50	
	10	2000-2010	88	-50	-60	-36	>25	
	5	2005-2010	89	-27	-37	-11	>25	
BBS N.Ireland	15	1995-2010	45	1	-22	33		
	10	2000-2010	52	-47	-48	-15	>25	
	5	2005-2010	61	-46	-47	-23	>25	

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

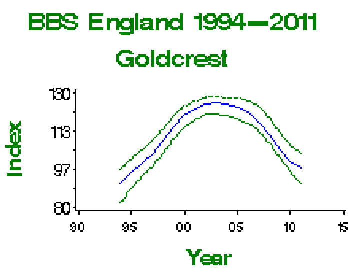
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



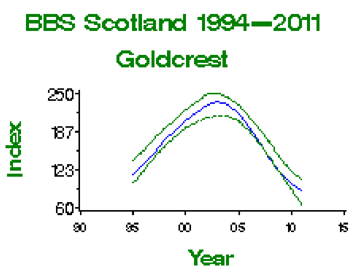
CBC/BBS England graph



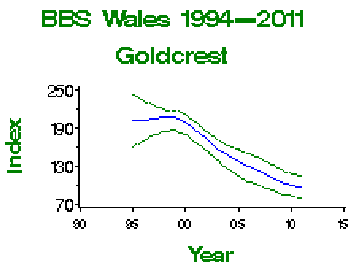
BBS UK graph



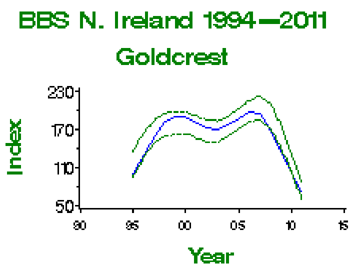
BBS England graph



BBS Scotland graph



BBS Wales graph



BBS N.Ireland graph

Demographic trends

Productivity and survival trends for this species are not currently produced by BTO

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Blue Tit

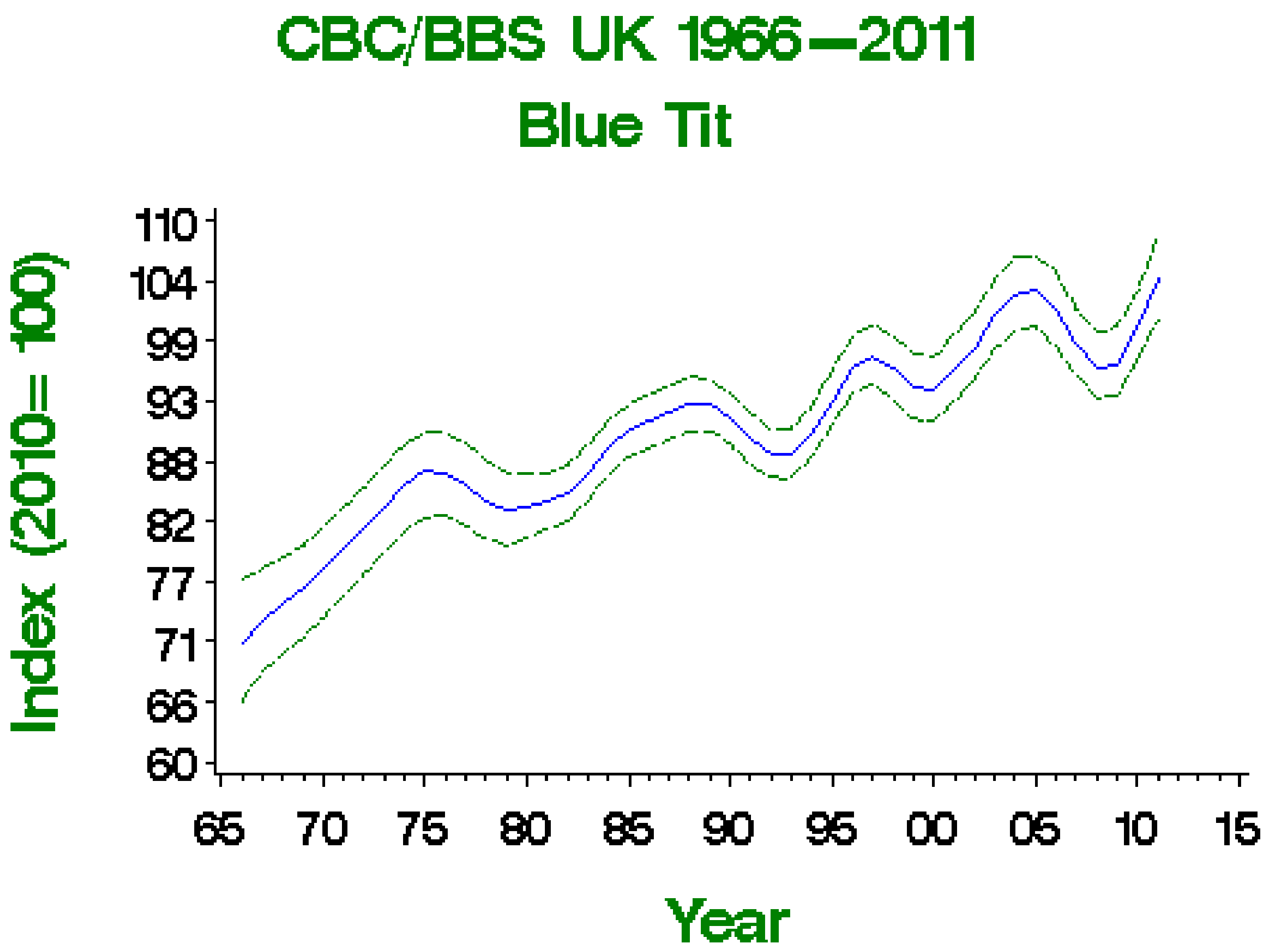
Cyanistes caeruleus

Key facts

Conservation listings:	Europe: no SPEC category (concentrated in Europe, conservation status favourable) (BiE04) UK: green (species level); amber (race obscurus, >20% of European breeders) (BoCC3)
Long-term trend:	UK, England: shallow increase
Population size:	3.6 million territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Status summary

Blue Tit populations have increased in abundance, in parallel with those of PECBMS 2012a).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

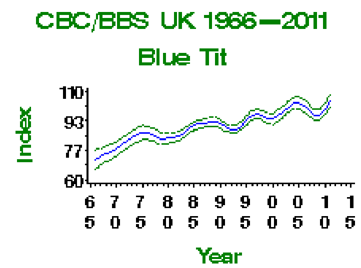
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	986	37	24	53		
	25	1985-2010	1538	10	4	16		
	10	2000-2010	2537	6	4	9		
	5	2005-2010	2871	-3	-5	-1		
CBC/BBS England	43	1967-2010	809	36	23	53		
	25	1985-2010	1256	7	1	14		
	10	2000-2010	2053	4	2	7		

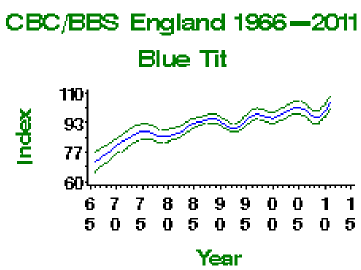
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	5	2005-2010	2335	-2	-4	0		
CES adults	26	1984-2010	99	12	-2	27		
	25	1985-2010	101	20	4	35		
	10	2000-2010	108	12	3	22		
	5	2005-2010	106	-5	-10	2		
CES juveniles	26	1984-2010	98	-8	-32	27		
	25	1985-2010	101	-2	-28	28		
	10	2000-2010	108	17	1	38		
	5	2005-2010	104	14	-2	30		
BBS UK	15	1995-2010	2262	7	4	11		
	10	2000-2010	2522	4	2	7		
	5	2005-2010	2871	-2	-4	0		
BBS England	15	1995-2010	1819	6	2	10		
	10	2000-2010	2017	3	0	7		
	5	2005-2010	2297	-1	-3	2		
BBS Scotland	15	1995-2010	164	9	-7	21		
	10	2000-2010	182	9	-6	23		
	5	2005-2010	217	-8	-18	2		
BBS Wales	15	1995-2010	176	21	8	36		
	10	2000-2010	199	15	6	27		
	5	2005-2010	209	2	-5	11		
BBS N.Ireland	15	1995-2010	76	8	-20	35		
	10	2000-2010	88	-7	-16	4		
	5	2005-2010	96	-17	-24	-10		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

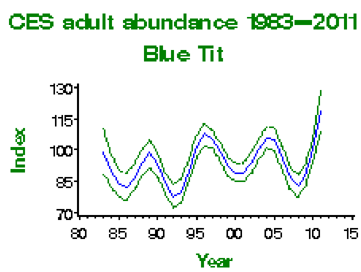
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



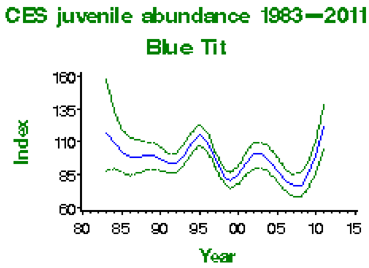
CBC/BBS UK graph



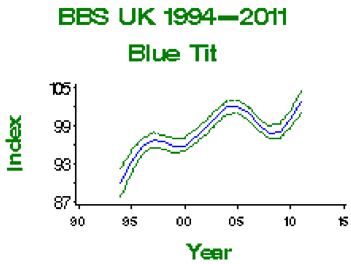
CBC/BBS England graph



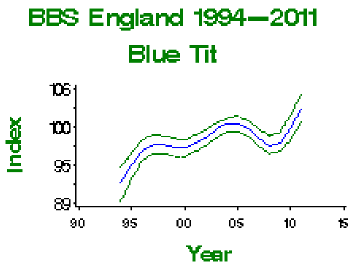
CES adults graph



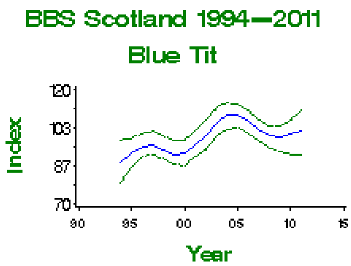
CES juveniles graph



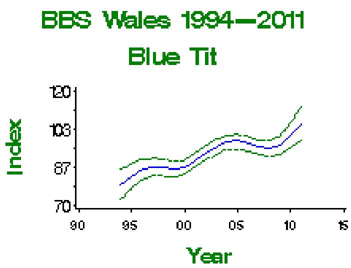
BBS UK graph



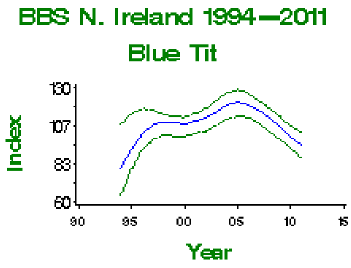
BBS England graph



BBS Scotland graph

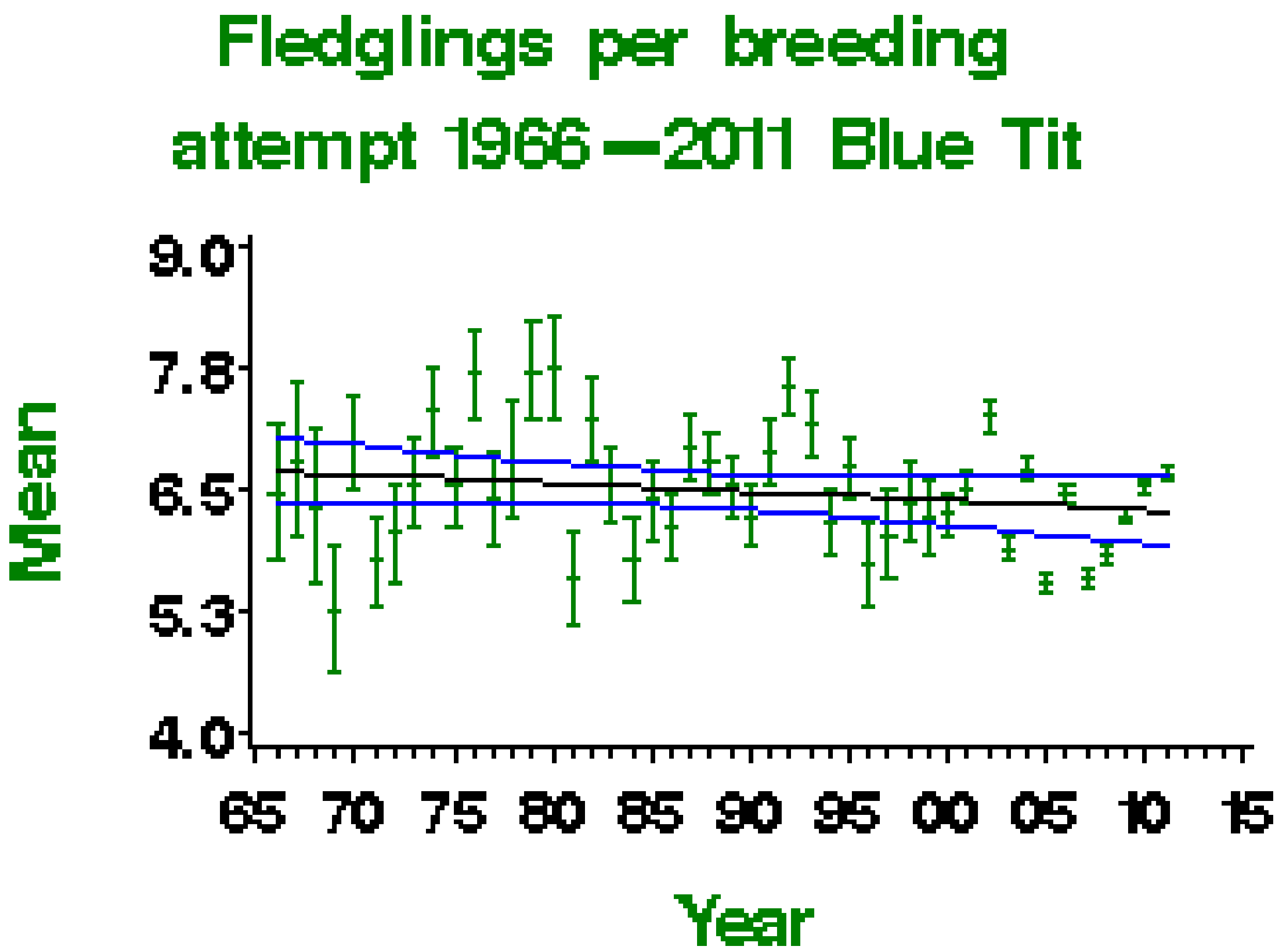


BBS Wales graph

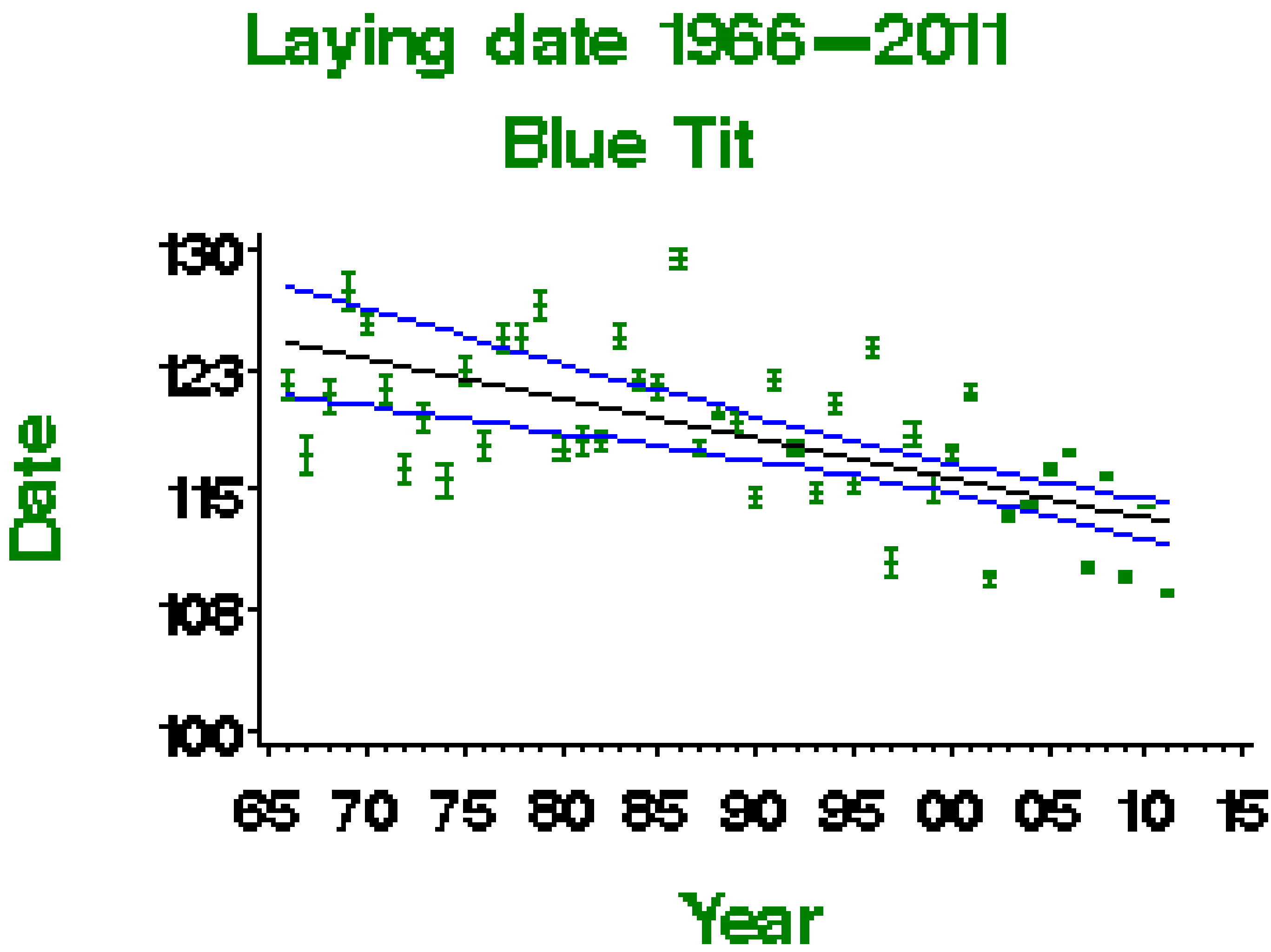


BBS N.Ireland graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

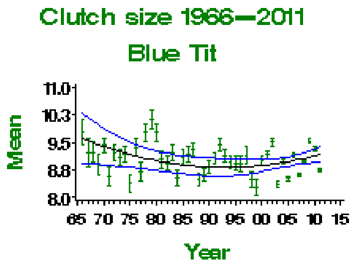


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

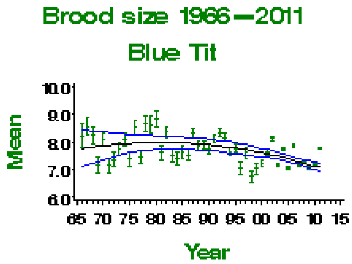
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	462	None					
Clutch size	42	1968-2010	380	Curvilinear	9.49 eggs	9.13 eggs	-3.8%		
Brood size	42	1968-2010	732	Curvilinear	7.82 chicks	7.15 chicks	-8.6%		
Nest failure rate at egg stage	42	1968-2010	647	Linear decline	0.35% nests/day	0.20% nests/day	-42.9%		
Nest failure rate at chick stage	42	1968-2010	462	Curvilinear	0.59% nests/day	0.67% nests/day	13.6%		
Laying date	42	1968-2010	464	Linear decline	May 4	Apr 23	-11 days		
Juvenile to Adult ratio (CES)	26	1984-2010	103	Smoothed trend	179 Index value	100 Index value	-44%	>25	
Juvenile to Adult ratio (CES)	25	1985-2010	105	Smoothed trend	172 Index value	100 Index value	-42%	>25	
Juvenile to Adult ratio (CES)	10	2000-2010	112	Smoothed trend	97 Index value	100 Index value	3%		
Juvenile to Adult ratio (CES)	5	2005-2010	109	Smoothed trend	90 Index value	100 Index value	12%		

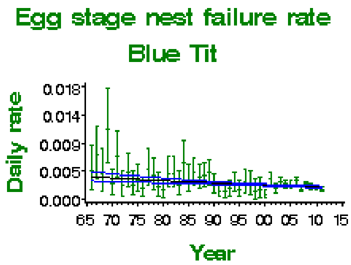
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



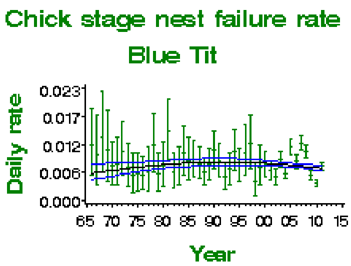
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



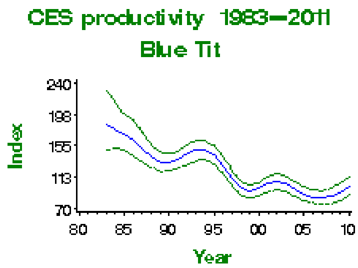
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



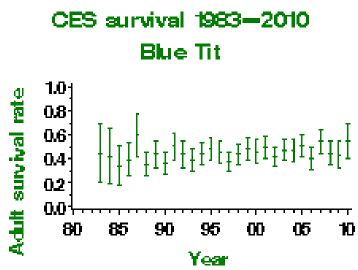
Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Smoothed long-term trend in ratio of juvenile:adult birds caught - green lines indicate 85% confidence limits



Proportion of adult birds surviving to following year - green bars represent 95% confidence limits

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Great Tit

Parus major

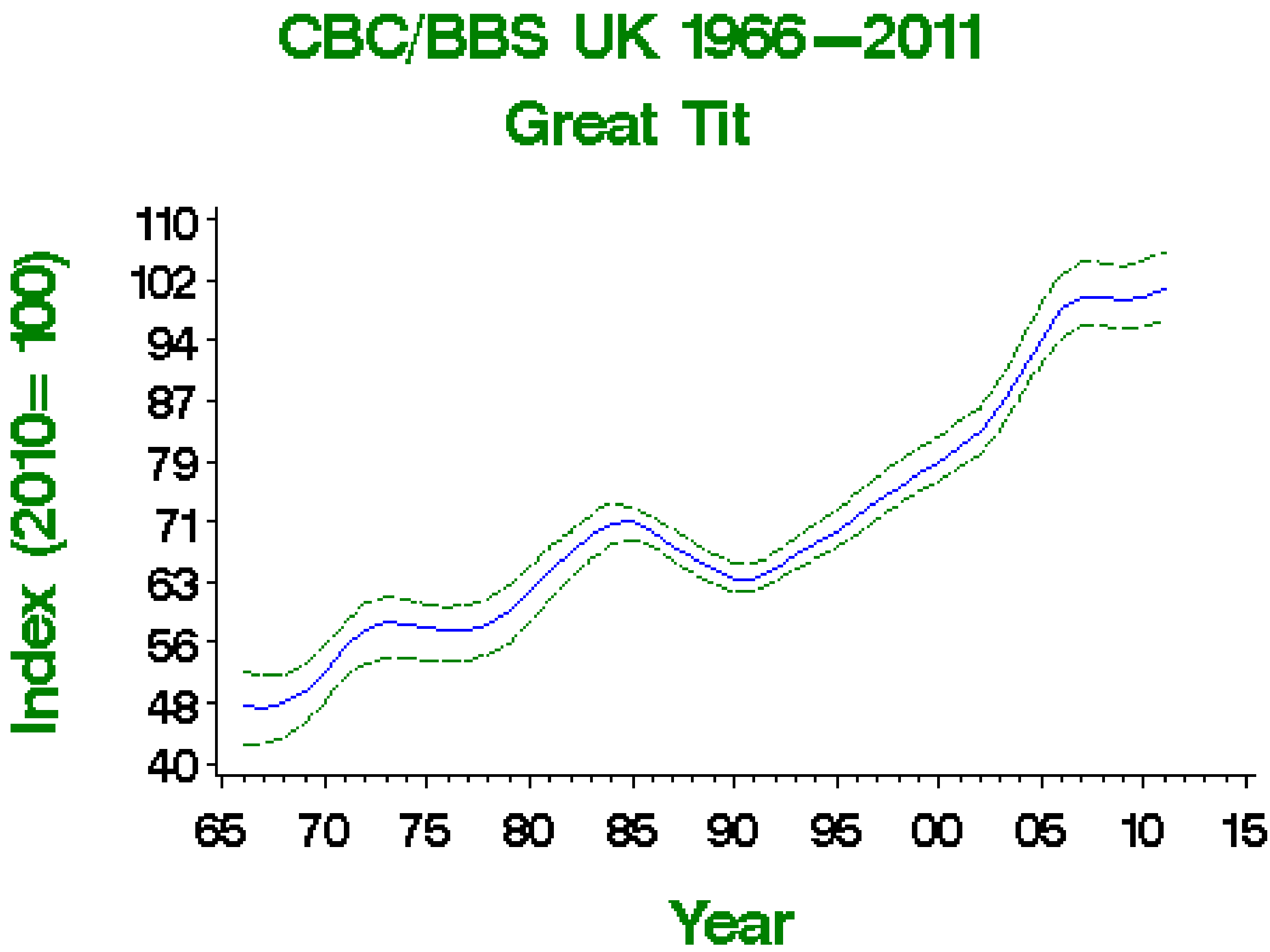
Key facts

Conservation listings:	Europe: no SPEC category (not concentrated in Europe, conservation status favourable) (BiE04) UK: green (species level, race major); amber (race newtoni, >20% of European breeders) (BoCC3)
Long-term trend:	UK, England: rapid increase
Population size:	2.6 million territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Migrant status:	Resident
Nesting habitat:	Cavity nester
Primary breeding habitat:	Woodland
Secondary breeding habitat:	
Breeding diet:	Animal
Winter diet:	Animal

Status summary

Great Tit numbers have increased fairly steadily since the 1960s, with the exception of two or three brief periods of stability or shallow decline. The BBS Lawson et al. 2012a). Laying dates have advanced by 11 days since 1968. Numbers have shown widespread moderate increase across Europe since 1980 (PECBMS 2012a).



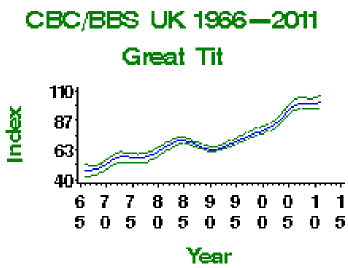
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

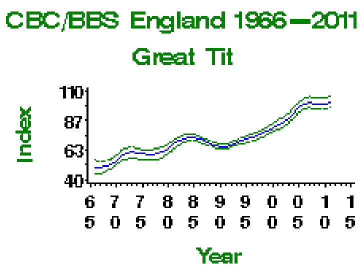
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	933	112	85	147		
	25	1985-2010	1454	41	31	53		
	10	2000-2010	2424	27	23	31		
	5	2005-2010	2765	6	3	8		
CBC/BBS England	43	1967-2010	767	101	76	137		
	25	1985-2010	1188	36	27	48		
	10	2000-2010	1963	23	20	27		
	5	2005-2010	2250	3	1	5		
CES adults	26	1984-2010	93	32	11	59		
	25	1985-2010	95	42	19	73		
	10	2000-2010	104	32	18	46		
	5	2005-2010	102	-6	-17	7		
CES juveniles	26	1984-2010	95	17	-16	67		
	25	1985-2010	98	19	-12	69		
	10	2000-2010	106	31	13	52		
	5	2005-2010	103	-4	-16	11		
BBS UK	15	1995-2010	2132	46	41	51		
	10	2000-2010	2409	27	23	30		
	5	2005-2010	2765	7	4	9		
BBS England	15	1995-2010	1716	41	37	46		
	10	2000-2010	1927	24	21	27		
	5	2005-2010	2212	5	2	7		
BBS Scotland	15	1995-2010	149	48	26	71		
	10	2000-2010	168	29	13	45		
	5	2005-2010	201	9	-2	18		
BBS Wales	15	1995-2010	169	60	37	83		
	10	2000-2010	192	40	25	55		
	5	2005-2010	204	17	7	30		
BBS N.Ireland	15	1995-2010	71	169	105	187		
	10	2000-2010	85	45	31	67		
	5	2005-2010	94	23	8	34		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

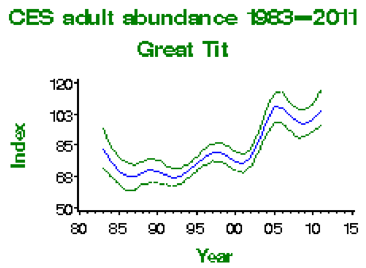
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



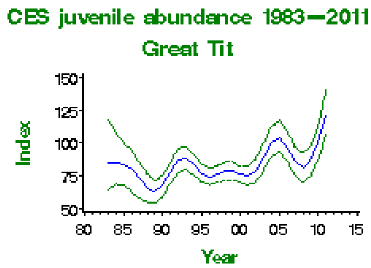
CBC/BBS UK graph



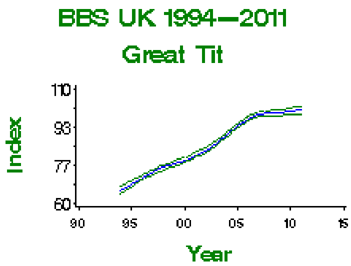
CBC/BBS England graph



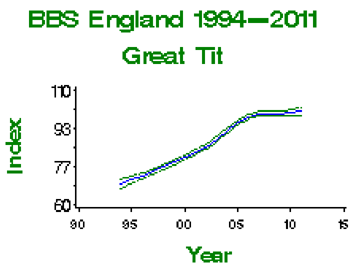
CES adults graph



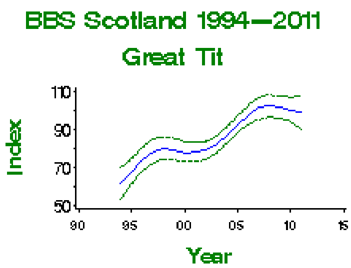
CES juveniles graph



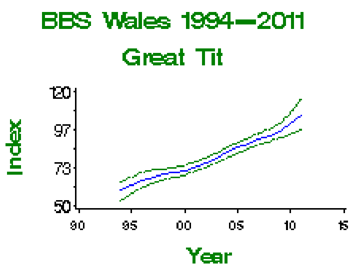
BBS UK graph



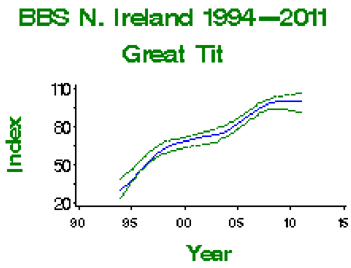
BBS England graph



BBS Scotland graph

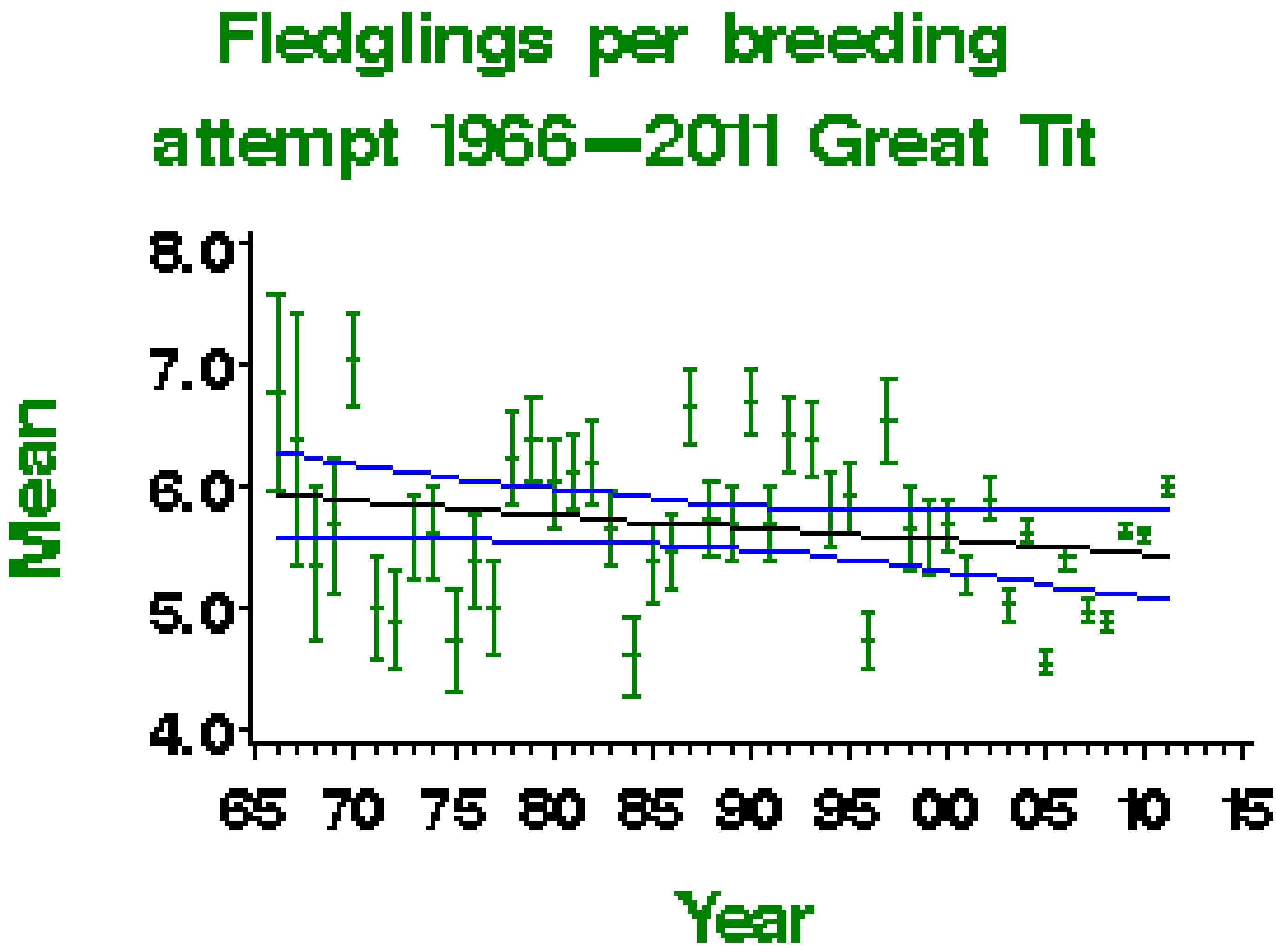


BBS Wales graph

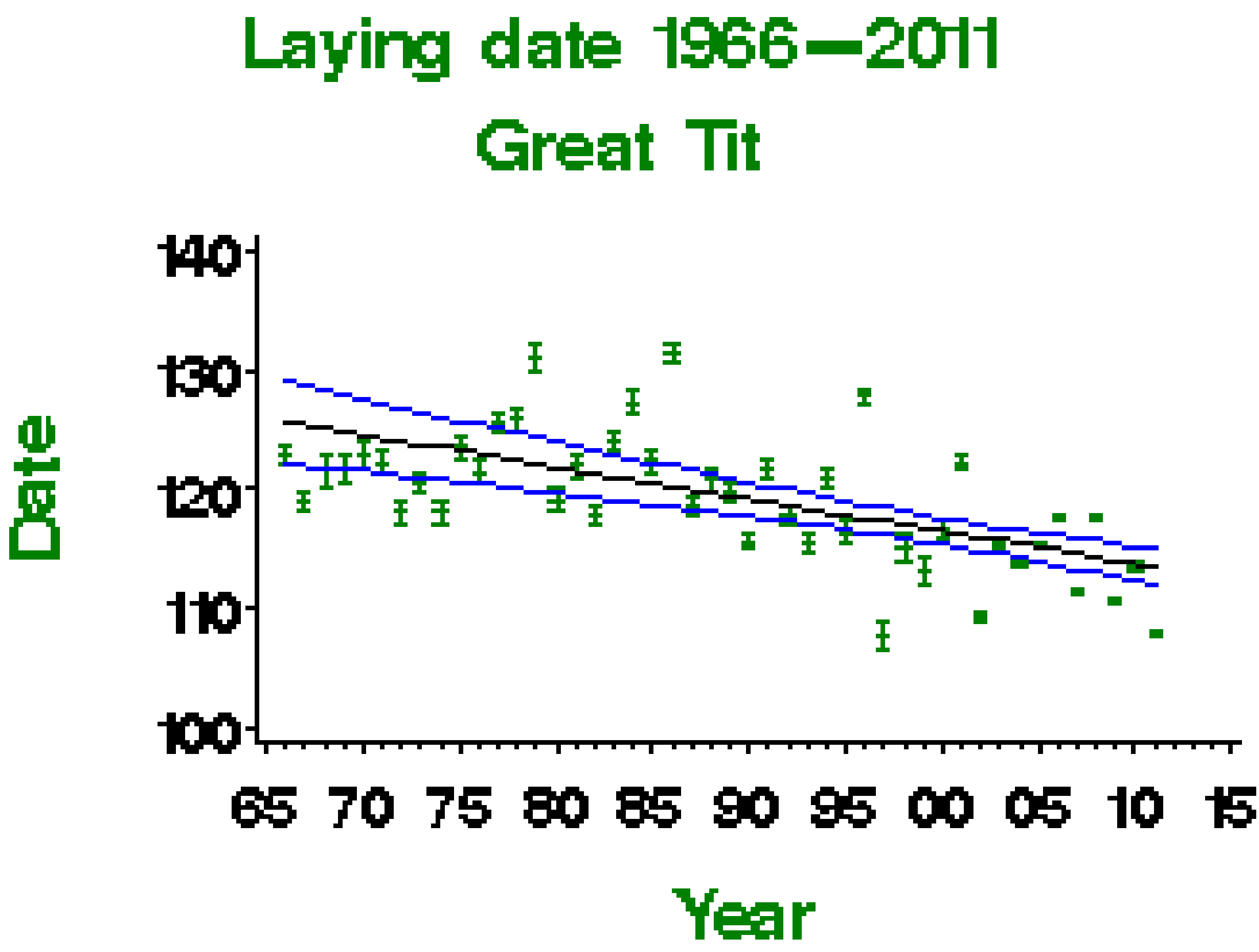


BBS N.Ireland graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

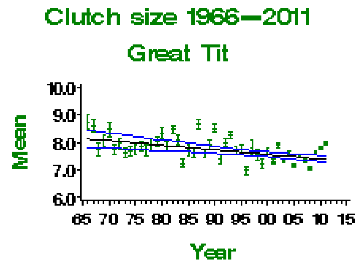


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

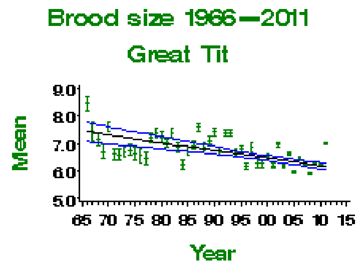
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	397	None					
Clutch size	42	1968-2010	311	Linear decline	8.10 eggs	7.42 eggs	-8.5%		
Brood size	42	1968-2010	651	Linear decline	7.36 chicks	6.18 chicks	-16.0%		
Nest failure rate at egg stage	42	1968-2010	573	Linear decline	0.51% nests/day	0.24% nests/day	-52.9%		
Nest failure rate at chick stage	42	1968-2010	397	Curvilinear	0.57% nests/day	0.63% nests/day	10.5%		
Laying date	42	1968-2010	353	Linear decline	May 5	Apr 24	-11 days		
Juvenile to Adult ratio (CES)	26	1984-2010	101	Smoothed trend	122 Index value	100 Index value	-18%		
Juvenile to Adult ratio (CES)	25	1985-2010	104	Smoothed trend	126 Index value	100 Index value	-20%		
Juvenile to Adult ratio (CES)	10	2000-2010	111	Smoothed trend	91 Index value	100 Index value	10%		
Juvenile to Adult ratio (CES)	5	2005-2010	107	Smoothed trend	94 Index value	100 Index value	6%		

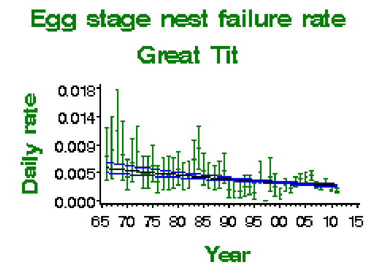
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



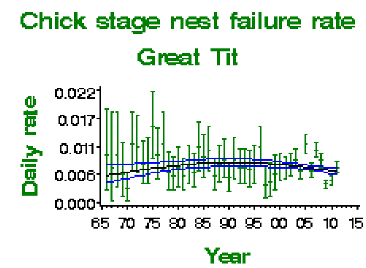
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



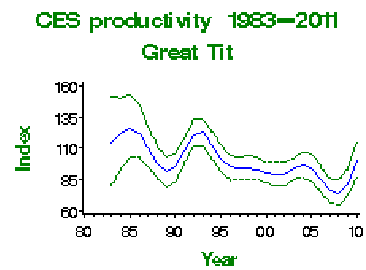
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



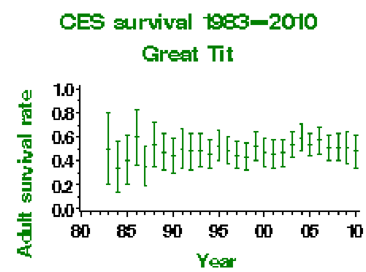
Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Smoothed long-term trend in ratio of juvenile:adult birds caught - green lines indicate 85% confidence limits



Proportion of adult birds surviving to following year - green bars represent 95% confidence limits

Causes of change

Demographic trends in breeding parameters do not suggest that increases in this species are due to improvements in breeding performance. There is some evidence, albeit limited, that improvements in survival rates, due to amelioration in wintering conditions, may have been responsible. Evidence for ecological drivers of the population increase is limited but increased provisioning in gardens and milder winters may have played a role.

Change factor	Primary driver	Secondary driver
Demographic	Improved survival	
Ecological	Other	Climate change

Further information on causes of change

The number of fledglings per breeding attempt has gone down and clutch and brood sizes have decreased, as has productivity (see above). Daily failure rates at the egg stage have also decreased but daily failure rates at the chick stage have increased. Thus, there is little good evidence from this that improvements in breeding parameters have driven the population increase.

Increases in survival rates, due to more widespread food provision in gardens during winter is one possible explanation for the increase. Horak & Lebreton (1998) found that survival rates in Estonia were higher in urban populations than rural ones and suggested that this was partly due to supplementary feeding in gardens. Increasing winter temperature may have also played a role. Ahola et al. (2009) suggested that, for their study population in Sweden, increasingly favourable conditions in winters have enhanced the survival rates of Great Tit and resulted in the observed increase in Great Tit breeding density.

Other factors may also have influenced survival rates. There is some evidence that the beech crop production may be influential and it has been shown that survival rates can be related to beech crop (Verhulst 1992, Perdeck et al. 2000), although there is no evidence that beechmast production has gone up. Perdecket al. (2000) provided further evidence for this as supplemental food increased survival of both juveniles and adults, supporting the winter-food limitation hypothesis. In a Finnish population, Orell (1989) reported that the high survival rates of resident juveniles after a warm August may be attributable to food availability during the time when the birds undergo their post-juvenile moult. Great Tits have advanced their laying date (see above), in line with climatic change. This has been found by several studies (e.g. Sanz 2002, Visser et al. 2009, Bauer et al. 2010).

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Coal Tit

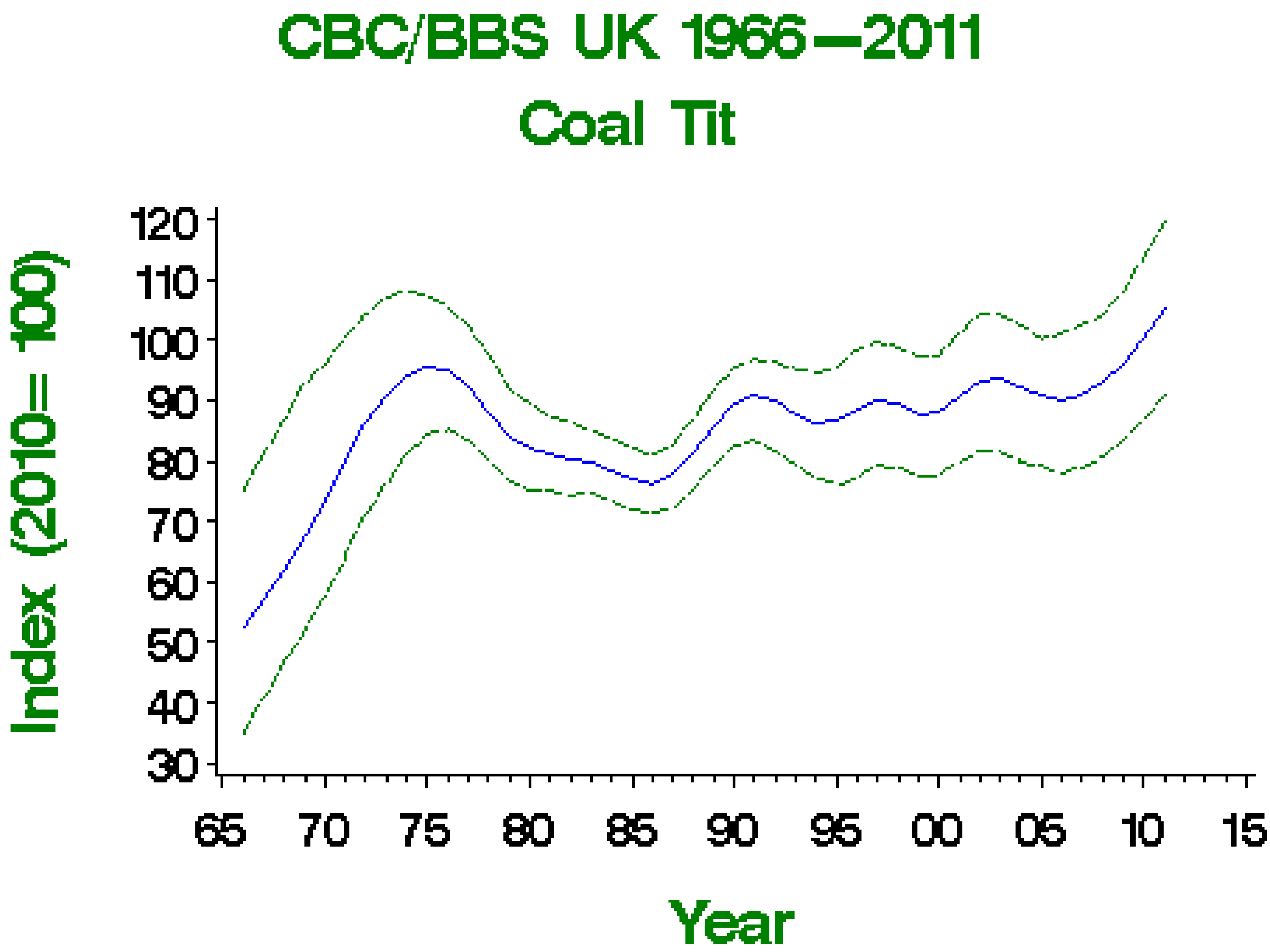
Periparus ater

Key facts

Conservation listings:	Europe: no SPEC category (not concentrated in Europe, conservation status favourable) (BiE04) UK: green (species level, race hibernicus); amber (race britannicus, >20% of European breeders) (BoCC3)
Long-term trend:	UK, England: moderate increase
Population size:	760,000 territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Status summary

While other common tit species have increased, the UK Coal Tit population has been rather stable since the mid 1970s, following earlier rapid increase. The ratios of Coal Tit to Perrins 2003), however, although in these figures population change may be confounded to some degree with changes in behaviour among birds and bird ringers. The BBS PECBMS 2012a).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

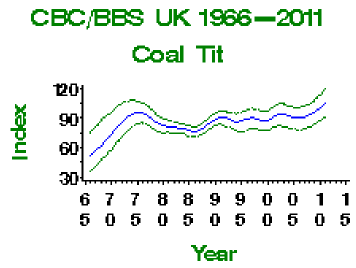
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	371	76	3	179		
	25	1985-2010	557	30	11	54		
	10	2000-2010	915	13	5	23		
	5	2005-2010	1051	10	4	19		
CBC/BBS England	43	1967-2010	259	78	-9	214		
	25	1985-2010	380	36	8	69		

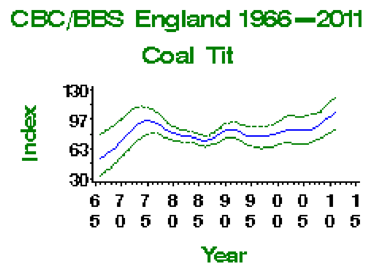
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	10	2000-2010	618	22	12	35		
	5	2005-2010	717	18	8	29		
BBS UK	15	1995-2010	786	17	6	30		
	10	2000-2010	907	12	4	21		
	5	2005-2010	1051	10	3	18		
BBS England	15	1995-2010	513	31	16	51		
	10	2000-2010	595	21	11	32		
	5	2005-2010	690	18	10	28		
BBS Scotland	15	1995-2010	128	3	-13	21		
	10	2000-2010	141	4	-12	22		
	5	2005-2010	170	3	-9	17		
BBS Wales	15	1995-2010	72	1	-25	34		
	10	2000-2010	81	18	-4	39		
	5	2005-2010	84	34	13	56		
BBS N.Ireland	15	1995-2010	62	78	23	116		
	10	2000-2010	72	4	-8	29		
	5	2005-2010	80	1	-12	16		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

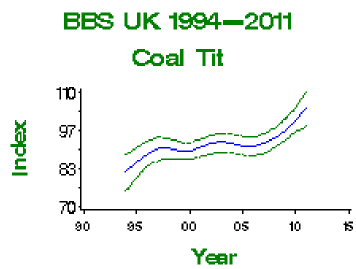
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



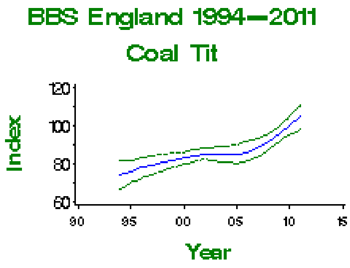
CBC/BBS UK graph



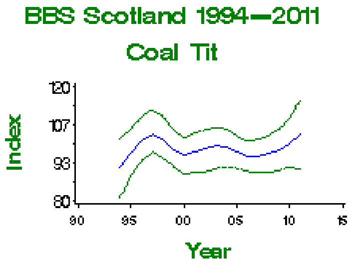
CBC/BBS England graph



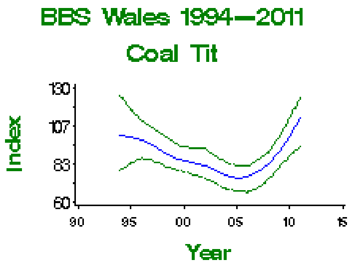
BBS UK graph



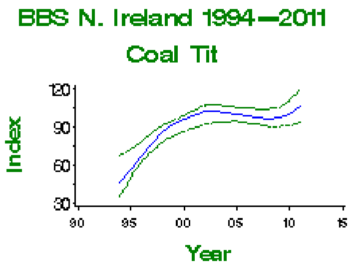
BBS England graph



BBS Scotland graph

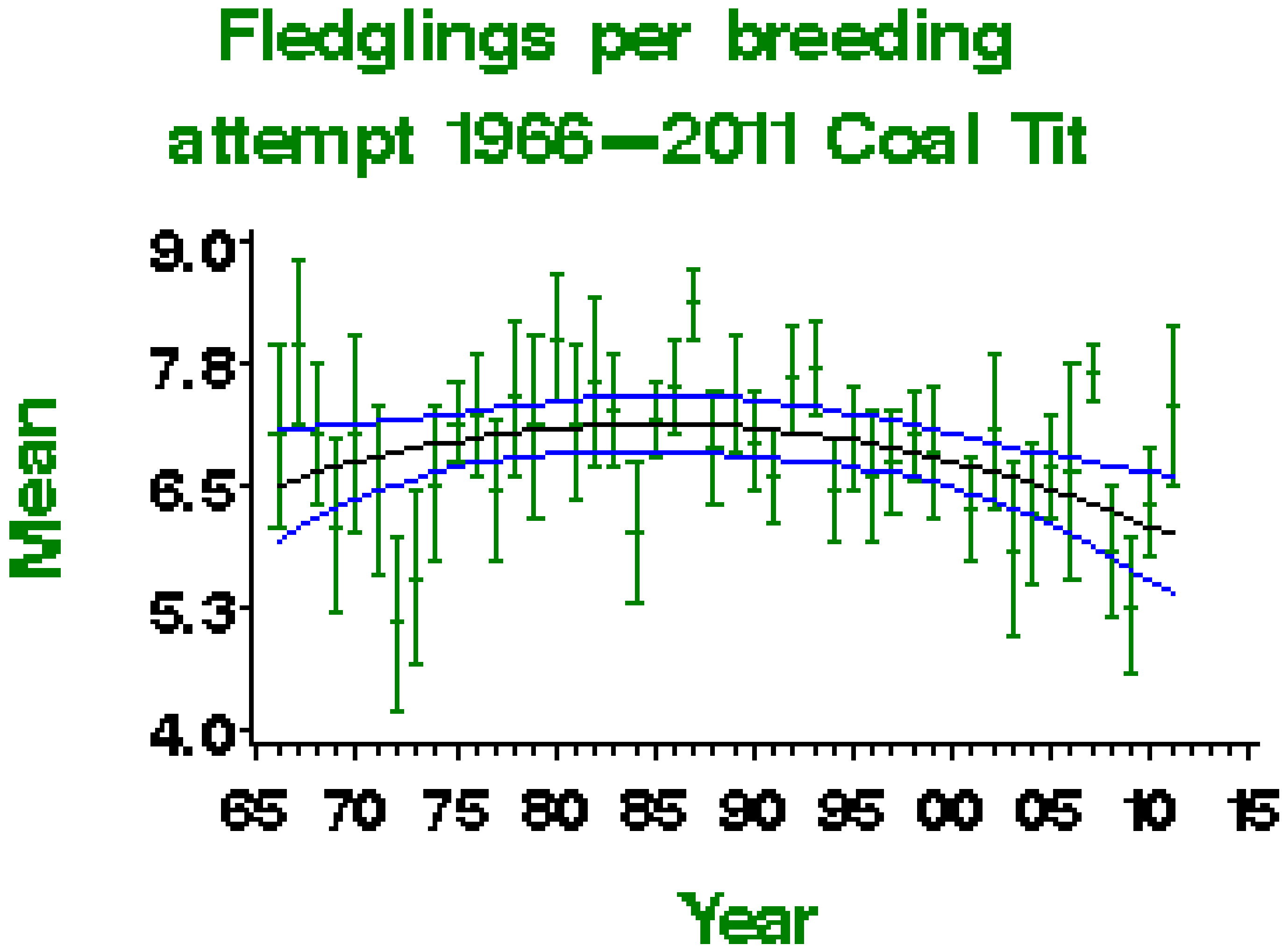


BBS Wales graph

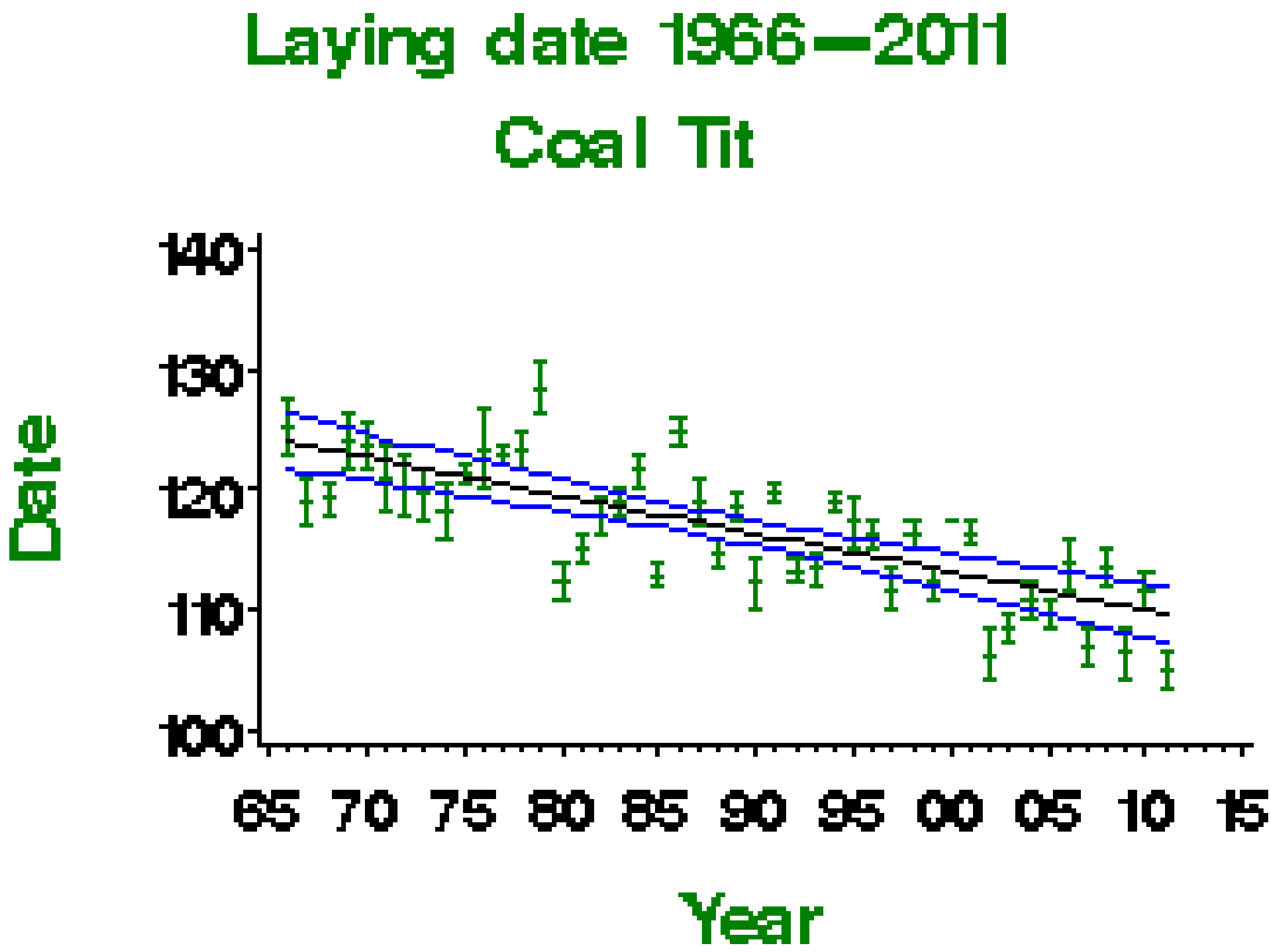


BBS N.Ireland graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend



Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

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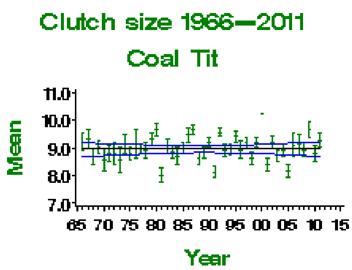
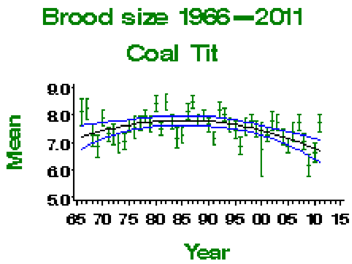
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	54	Curvilinear	6.65 fledglings	6.10 fledglings	-8.3%		
Clutch size	42	1968-2010	40	None					
Brood size	42	1968-2010	75	Curvilinear	7.31 chicks	6.78 chicks	-7.2%		
Nest failure rate at egg stage	42	1968-2010	56	Linear decline	0.50% nests/day	0.14% nests/day	-72.0%		
Nest failure rate at chick stage	42	1968-2010	59	Linear increase	0.17% nests/day	0.45% nests/day	164.7%		
Laying date	42	1968-2010	45	Linear decline	May 3	Apr 20	-13 days		

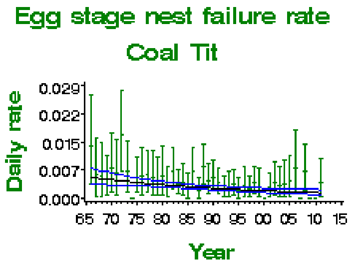
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



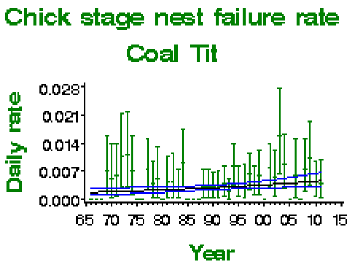
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Willow Tit

Poecile montanus

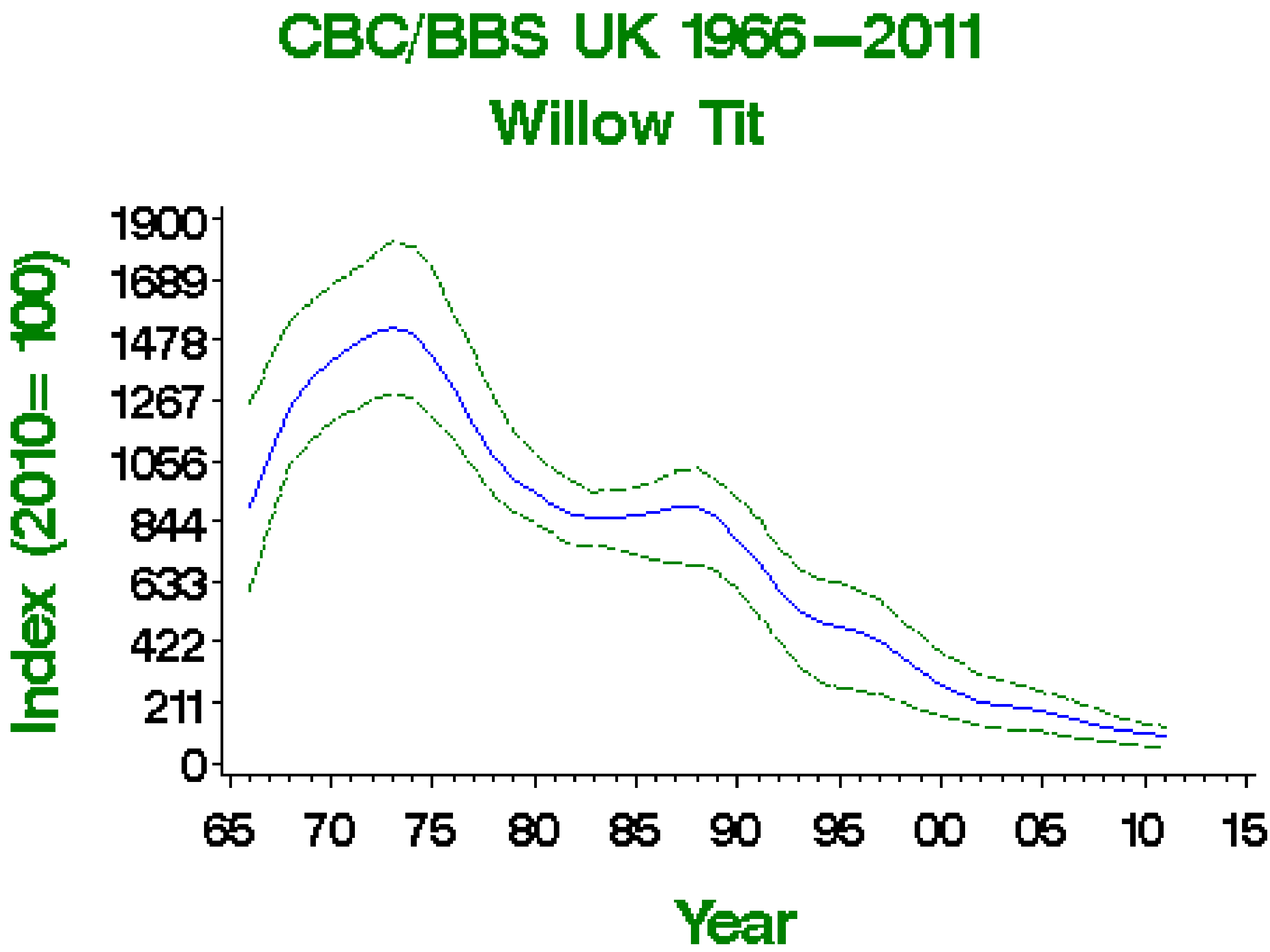
Key facts

Conservation listings:	Europe: no SPEC category (not concentrated in Europe, conservation status favourable) (BiE04) UK: red (>50% population decline) (BoCC3); an RBBP species UK Biodiversity Action Plan: priority species
Long-term trend:	UK, England: rapid decline
Population size:	3,400 pairs in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Migrant status:	Resident
Nesting habitat:	Cavity nester
Primary breeding habitat:	Woodland
Secondary breeding habitat:	
Breeding diet:	Animal
Winter diet:	Vegetation

Status summary

Willow Tits have been in decline since the mid 1970s, and have become locally extinct in an ever-growing number of former haunts. The continuing decline in the CBC/BBS index through the 1990s, following a brief period of stability during the 1980s, is replicated in the CES abundance trend. The UK conservation listing was upgraded from amber to red in 2002. All UK breeding records since 2010 should be forwarded to the Rare Breeding Birds Panel. Willow Tit has shown widespread moderate decline across Europe since 1980, but has declined to a lesser extent in central and eastern Europe than in the north, west and south (PECBMS 2007, 2012a).



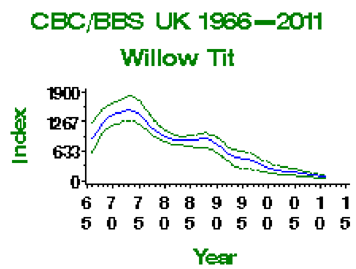
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

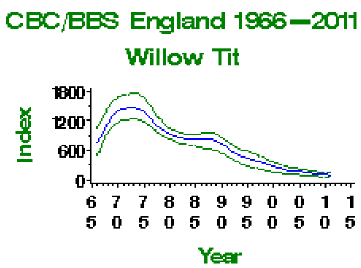
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	43	-91	-96	-85	>50	
	25	1985-2010	46	-88	-93	-83	>50	Small CBC sample
	10	2000-2010	47	-63	-73	-54	>50	
	5	2005-2010	49	-45	-56	-32	>25	
CBC/BBS England	43	1967-2010	40	-90	-95	-83	>50	
	25	1985-2010	41	-88	-93	-81	>50	Small CBC sample
	10	2000-2010	42	-62	-71	-51	>50	
	5	2005-2010	45	-40	-53	-23	>25	
CES adults	26	1984-2010	18	-51	-86	-10	>50	Small sample
	25	1985-2010	18	-55	-87	-18	>50	Small sample
CES juveniles	26	1984-2010	27	-52	-77	-1	>50	
	25	1985-2010	27	-48	-76	18		
	10	2000-2010	15	-13	-53	46		Small sample
	5	2005-2010	13	-11	-45	41		Small sample
BBS UK	15	1995-2010	51	-79	-86	-71	>50	
	10	2000-2010	46	-64	-74	-52	>50	
	5	2005-2010	49	-43	-53	-28	>25	
BBS England	15	1995-2010	45	-78	-84	-71	>50	
	10	2000-2010	41	-62	-71	-53	>50	
	5	2005-2010	44	-39	-54	-26	>25	

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

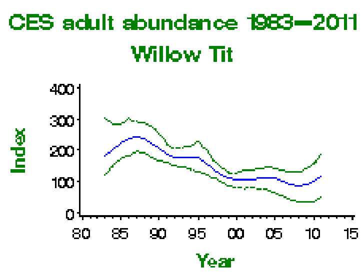
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



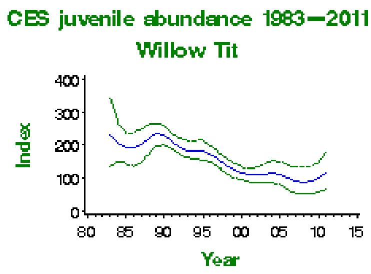
CBC/BBS UK graph



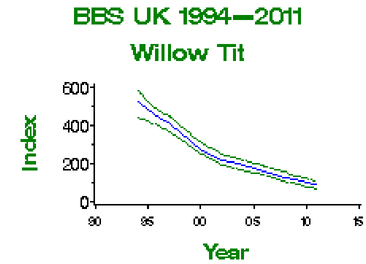
CBC/BBS England graph



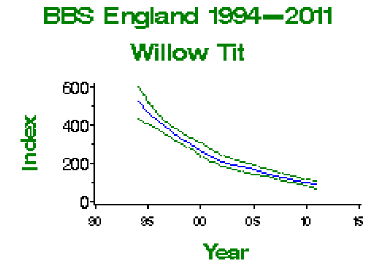
CES adults graph



CES juveniles graph



BBS UK graph

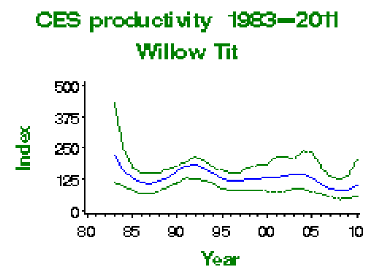


BBS England graph

Demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Juvenile to Adult ratio (CES)	26	1984-2010	29	Smoothed trend	165 Index value	100 Index value	-40%		
Juvenile to Adult ratio (CES)	25	1985-2010	30	Smoothed trend	129 Index value	100 Index value	-22%		
Juvenile to Adult ratio (CES)	10	2000-2010	17	Smoothed trend	129 Index value	100 Index value	-22%		
Juvenile to Adult ratio (CES)	5	2005-2010	15	Smoothed trend	130 Index value	100 Index value	-23%		

For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



Smoothed long-term trend in ratio of juvenile:adult birds caught - green lines indicate 85% confidence limits

Causes of change

Willow Tits have declined in woodland, probably because of habitat degradation. How this relates to demographic trends is unclear.

Change factor	Primary driver	Secondary driver
Demographic	Unknown	
Ecological	Changes in woodland	

Further information on causes of change

Little evidence is available regarding changes in the demography of this species but CES trends suggest a decline in productivity since 1983 (see above). Lampila et al. (2006) found that adult survival was the main driver of Willow Tit populations in northern Finland, although this was in a study in boreal forests, so the processes may not be the same as for the British population. The British subspecies does in fact show very different habitat preferences to the Fennoscandian one, preferring wet woodland rather than conifers, emphasising that European studies may not be very relevant to population change in the UK.

There are several hypotheses that have been put forward to explain the cause of population declines of Willow Tit. One is that deterioration in the quality of woodland as feeding habitat for this species through canopy closure and increased browsing by deer (Perrins 2003, Siriwardena 2004, Fuller et al. 2005) has been important. The area of wet woodland and scrub is also thought to have declined as a result of drainage and the occurrence of increasingly dry summers (Vanhinsbergh et al. 2003). A field study based on former CBC sites and other woods that were known to have held the species in the past provided good evidence that the sites still holding Willow Tit tended to be wetter, so drying out of woodlands may have been a factor (Lewis et al. 2007, 2009a, 2009b). Siriwardena (2004) analysed long-term CBC trends and found that, although population trends have been stable in their preferred, wet habitats, Willow Tit have declined in woodland, probably because of habitat degradation.

A second hypothesis is that nest predation pressure, from Jays, Great Spotted Woodpeckers and grey squirrel, for example, has increased, both because some of these predators have grown more abundant (Harris et al. 1995, this report) and because restrictions in nest-site availability are likely to have forced more birds into suboptimal, more vulnerable sites. In the study mentioned above, Siriwardena (2004) found increases in Green Woodpecker abundance on CBC plots at the same time as declines in Willow Tit abundance, but this is unlikely to reflect a causal link - this woodpecker being unrecorded as a nest predator. A negative relationship between Great Spotted Woodpecker and Willow Tit abundance on farmland plots is more likely to reflect a real population effect, but farmland is only a minor habitat for the species, so it is unlikely that such a relationship has biological significance for Willow Tits nationally. There were no significant associations with other avian potential nest predators. Supporting this result, Lewis et al. (2007, 2009a, 2009b) found that sites that were known to have held the species in the past and that were still holding Willow Tits did not differ in the density of potential nest predators.

Thirdly, increases in the local populations of behaviourally dominant, sympatric species such as Blue Tit, Great Tit, Marsh Tit and Nuthatch could have led to increased competition, especially for nest-holes. There is little direct evidence specifically concerning foraging interactions involving Willow Tit in the UK but it is possible that increases in other tit species have placed extra pressure on Willow Tit populations through competition for food or nest sites (Vanhinsbergh et al. 2003). In Lanarkshire, central Scotland, Great and Blue Tits were found commonly to take over the nest sites of Willow Tit (Maxwell 2002, 2003) but it is unclear how widespread this phenomenon is. In the analysis of long-term CBC trends carried out by Siriwardena (2004), no negative relationships were found between Willow Tit and its potential competitors. Again, this was supported by field data from Lewis et al. (2007, 2009a, 2009b), who found that sites that were known to have held the species in the past and that that were still holding Willow Tits did not differ in the density of avian competitors.

Overall, therefore, habitat deterioration is the strongest candidate as the cause of Willow Tit decline nationally. As well as increasing woodland drainage, degradation has been hypothesised to have occurred via a reduction in nest-site availability resulting from falls in the amount of dead wood and number of dead trees in woodland reducing nesting opportunities (Vanhinsbergh et al. 2003). This has yet to be tested formally, however, probably because historical data on quantities of dead wood are not available.

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Marsh Tit

Poecile palustris

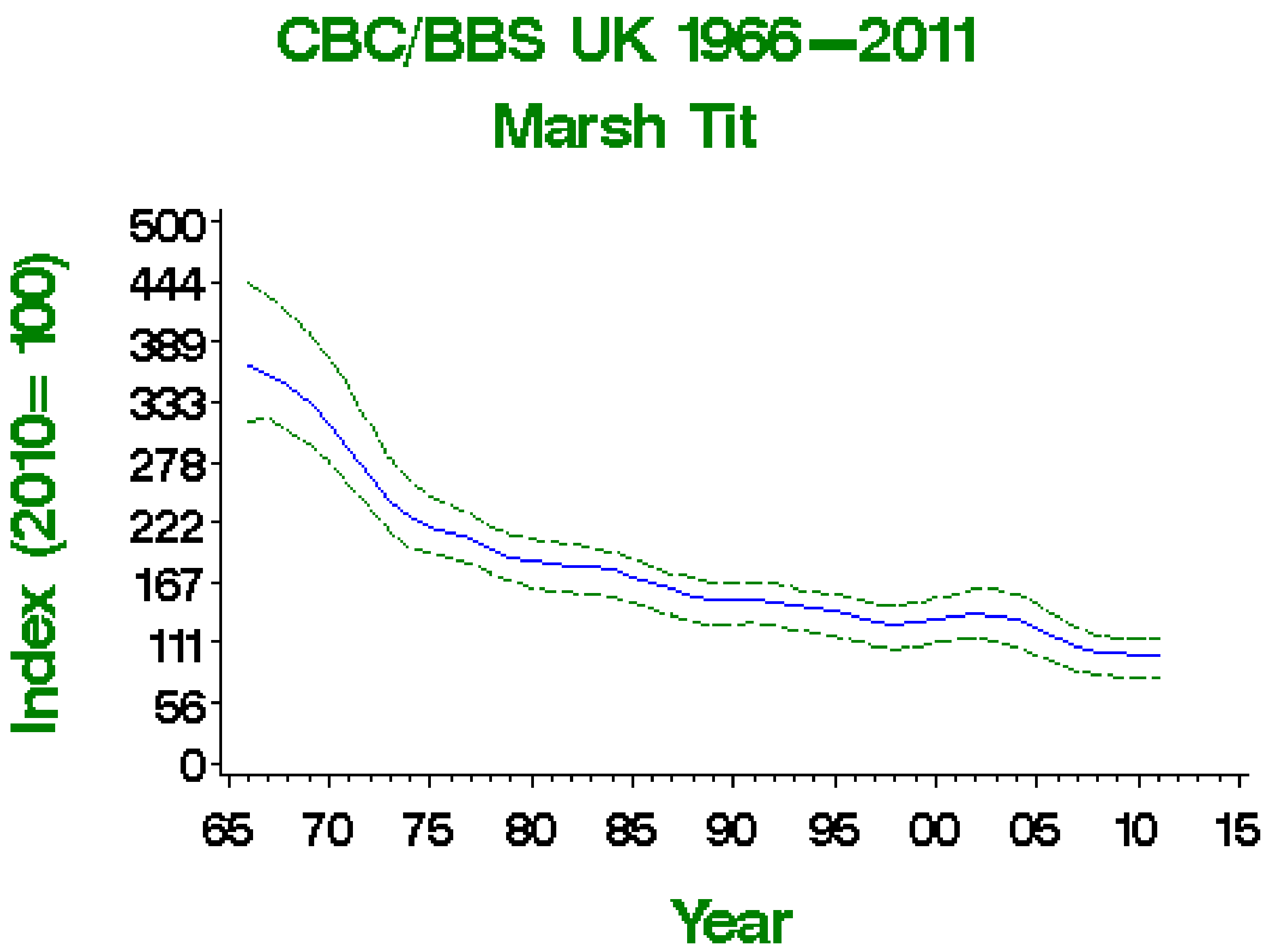
Key facts

Conservation listings:	Europe: SPEC category 3 (declining) (BiE04) UK: red (>50% population decline) (BoCC3) UK Biodiversity Action Plan: priority species
Long-term trend:	UK, England: rapid decline
Population size:	41,000 territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Migrant status:	Resident
Nesting habitat:	Cavity nester
Primary breeding habitat:	Woodland
Secondary breeding habitat:	
Breeding diet:	Animal
Winter diet:	Animal

Status summary

Marsh Tit abundance has declined almost continuously since BTO monitoring began. The species' UK conservation listing has recently been upgraded from amber to red. Numbers have shown widespread moderate decline across Europe since 1980, though with little change since 1990 (PECBMS 2012a). The European status of this species is no longer considered "secure" (BirdLife International 2004).



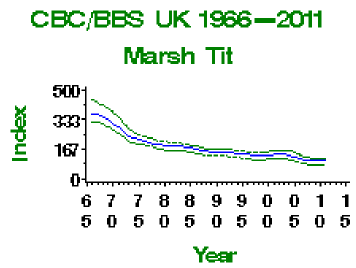
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

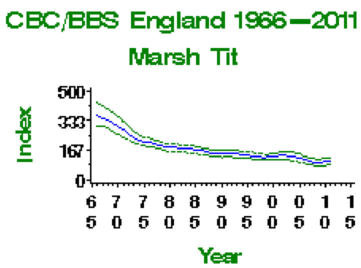
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	97	-72	-81	-63	>50	
	25	1985-2010	124	-42	-57	-27	>25	
	10	2000-2010	163	-25	-38	-13	>25	
	5	2005-2010	172	-19	-34	-9		
CBC/BBS England	43	1967-2010	89	-71	-81	-60	>50	
	25	1985-2010	113	-41	-53	-23	>25	
	10	2000-2010	147	-23	-33	-9		
	5	2005-2010	155	-15	-31	1		
BBS UK	15	1995-2010	145	-22	-34	-10		
	10	2000-2010	156	-27	-37	-15	>25	
	5	2005-2010	165	-18	-29	-8		
BBS England	15	1995-2010	131	-24	-37	-10		
	10	2000-2010	142	-24	-36	-10		
	5	2005-2010	151	-15	-28	-2		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

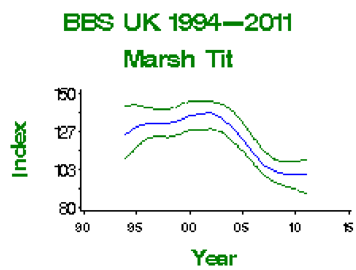
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



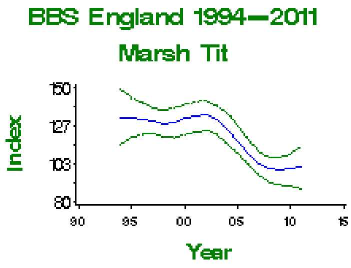
CBC/BBS UK graph



CBC/BBS England graph

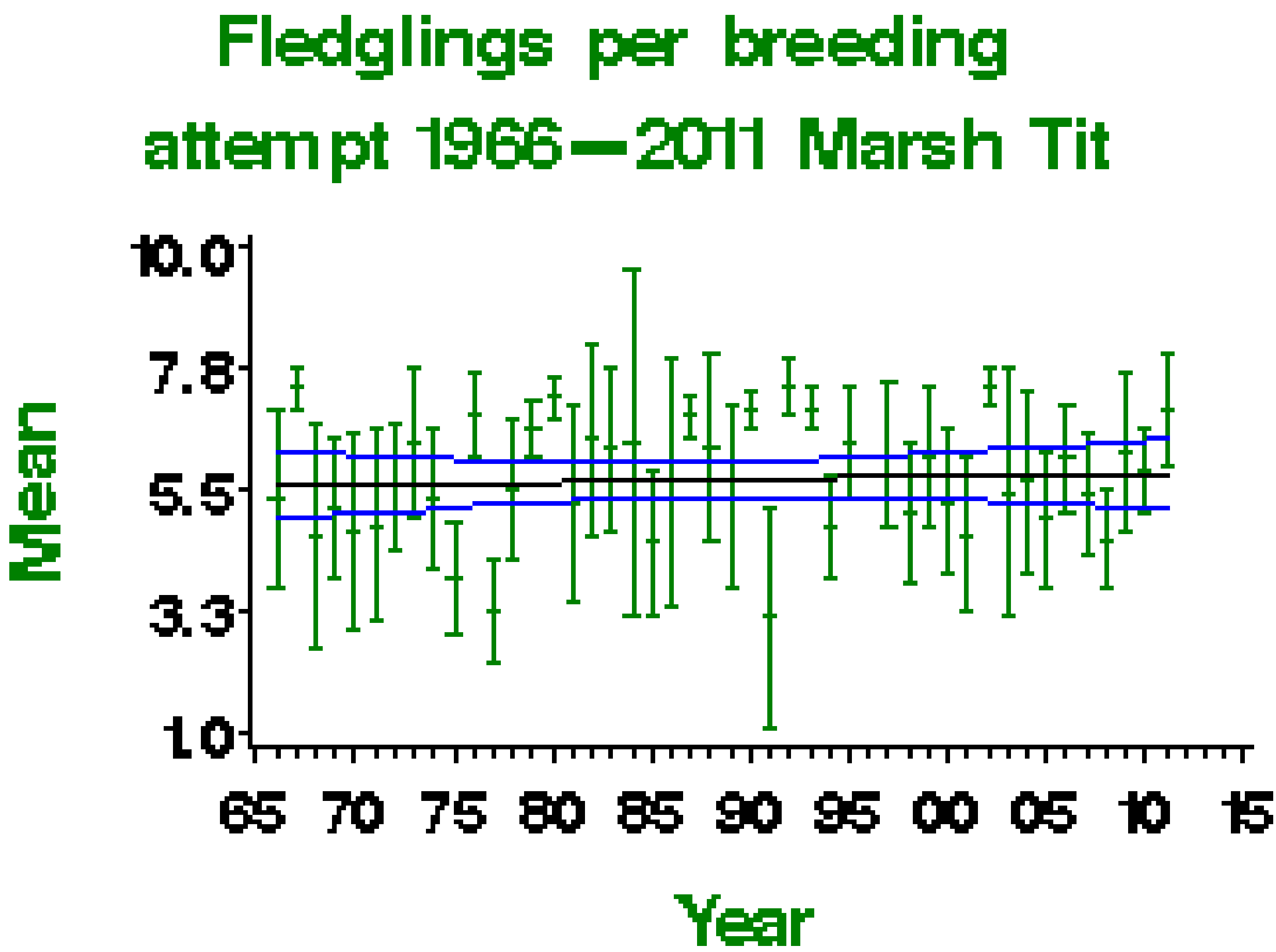


BBS UK graph

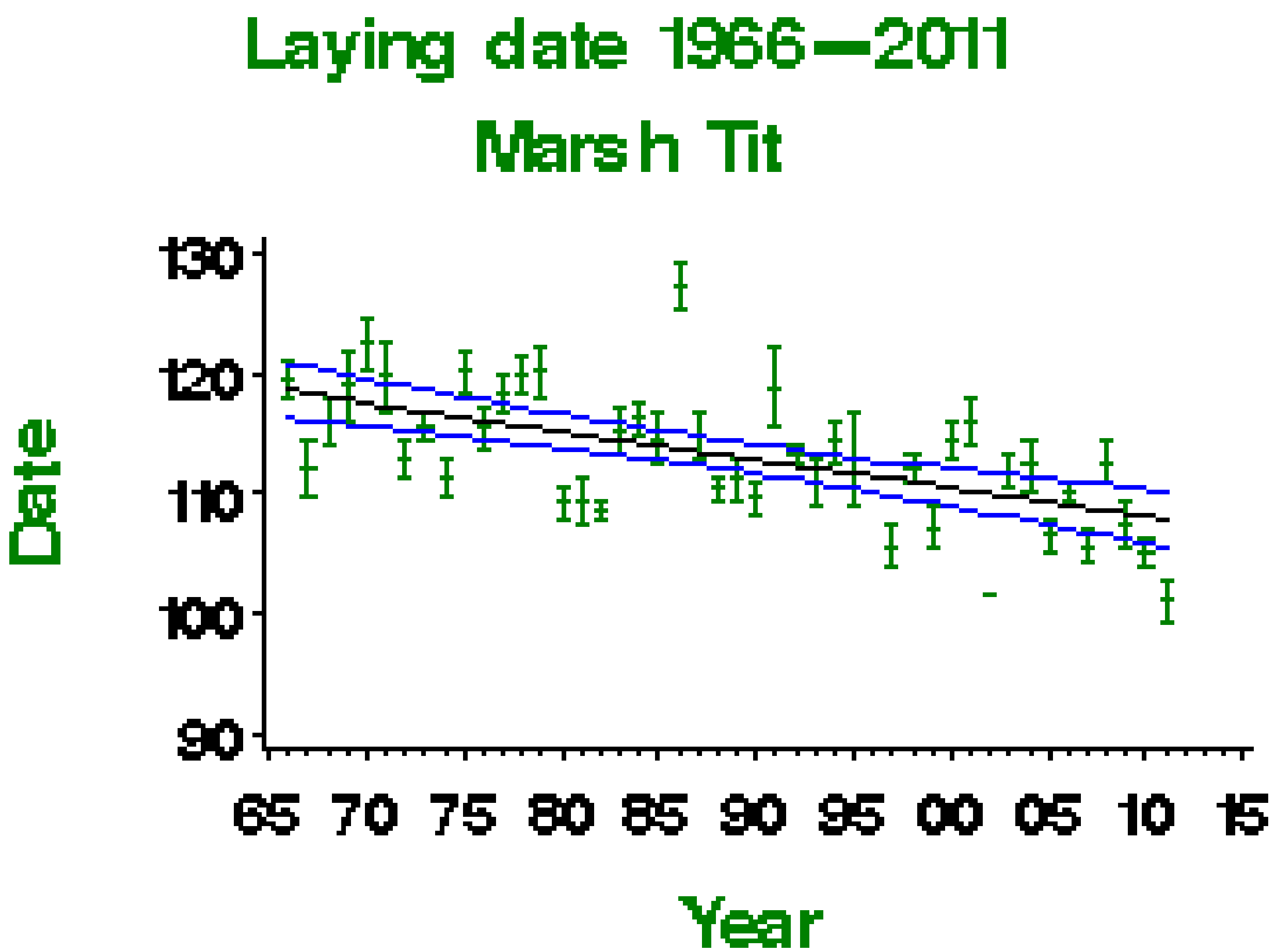


BBS England graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

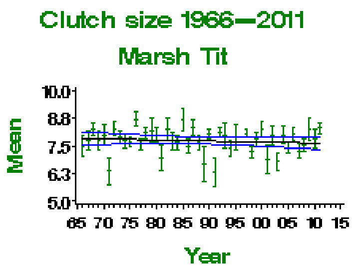


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

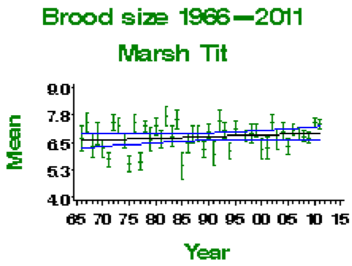
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	19	None					
Clutch size	42	1968-2010	14	None					Small sample
Brood size	42	1968-2010	24	None					Small sample
Nest failure rate at egg stage	42	1968-2010	21	Linear decline	0.73% nests/day	0.12% nests/day	-83.6%		Small sample
Nest failure rate at chick stage	42	1968-2010	20	Linear increase	0.46% nests/day	0.93% nests/day	102.2%		Small sample
Laying date	42	1968-2010	14	Linear decline	Apr 28	Apr 18	-10 days		Small sample

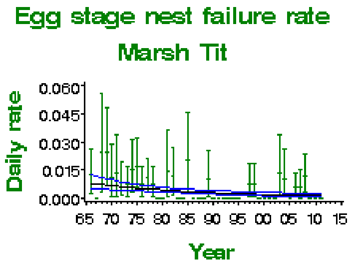
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



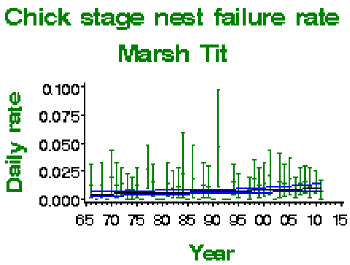
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

Causes of change

There is good evidence that changes in the habitat quality of woodlands, namely a loss of understorey, have been responsible for the decline in Marsh Tits. Analysis of the BTO's ring-recovery archive provides evidence that there has been a significant negative trend in annual survival rates during the period of decline, although this is based on a small sample size.

Change factor	Primary driver	Secondary driver
Demographic	Reduced survival	
Ecological	Changes in woodland	

Further information on causes of change

Analysis of the BTO's ring-recovery archive provides evidence that there has been a significant negative trend in annual survival rates during the period of decline, although this is based on a small sample size. The absence of any reduction in breeding performance as the population declined supports a reduction in annual survival as the demographic mechanism (Siriwardena 2006). Nest failure rates have fallen during the period of decline, but no trend is evident in the number of fledglings per breeding attempt (see above).

One hypothesis relating to the causes of decline is that changes in woodland understorey have reduced habitat quality, due to increased browsing by deer (Perrins 2003, Fuller et al. 2005). Carpenter (2008) and Carpenteret al. (2010) conducted a detailed study providing good evidence that Marsh Tits were more likely to locate their territories in sections of woodland with more understorey cover. Carpenter found that birds in territories with more understorey raised more and heavier young than did birds in territories with less understorey, although this was based on only one year of data. The same study reported that understorey and low canopy sections were also important during winter while Hinsley et al. (2007) provide further evidence that this was important, showing that that Marsh Tits were selecting the understorey and habitat lower down in the woodland canopy. Another field study conducted by Broughton et al. (2006), however, did not find any difference in the amount of shrub layer in Marsh Tit territories compared to pseudo-territories, although this was from just one site and the authors noted that the understorey there was unusually healthy and complete, perhaps explaining this result.

A reduction in habitat quality through fragmentation is another possible factor that has contributed to declines, although there has been little fragmentation of woodland in a gross sense in recent years. Nevertheless, Hinsley et al. (1995) found that Marsh Tits need a minimum wood size of 0.5 ha and it's possible that habitat deterioration has reduced effective habitat patch size.

Another hypothesis concerning causes of decline relates to competition and nest predation. Marsh Tit is subdominant to both Great Tit and Blue Tit but Siriwardena (2006) found no evidence for population effects of the Marsh Tit being outcompeted for natural nest cavities. Similarly, the same study found no evidence that avian nest predation is a major factor in the long-term decline as Marsh Tit abundance was not significantly related to abundance in the previous year of any of the nest predators considered (Siriwardena 2006). Amar et al. (2006) found no association between population change and grey squirrel abundance and adding to this, Smart et al. (2007) conducted an initial analysis and showed that Marsh Tit declines were also unlikely to be caused by predation by grey squirrel, as presence and abundance of Marsh Tit was positively related to squirrel density.

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Woodlark

Lullula arborea

Key facts

Conservation listings:	Europe: SPEC category 2 (depleted) (BiE04) UK: amber (European status, long-term UK range contraction, localised UK breeding) (BoCC3); an RBBP species UK Biodiversity Action Plan: click here, priority species
Long-term trend:	UK: increase
Population size:	3,100 (2,500-3,700) pairs in 2006 (APEP13: Conway et al. 2009)

Status summary

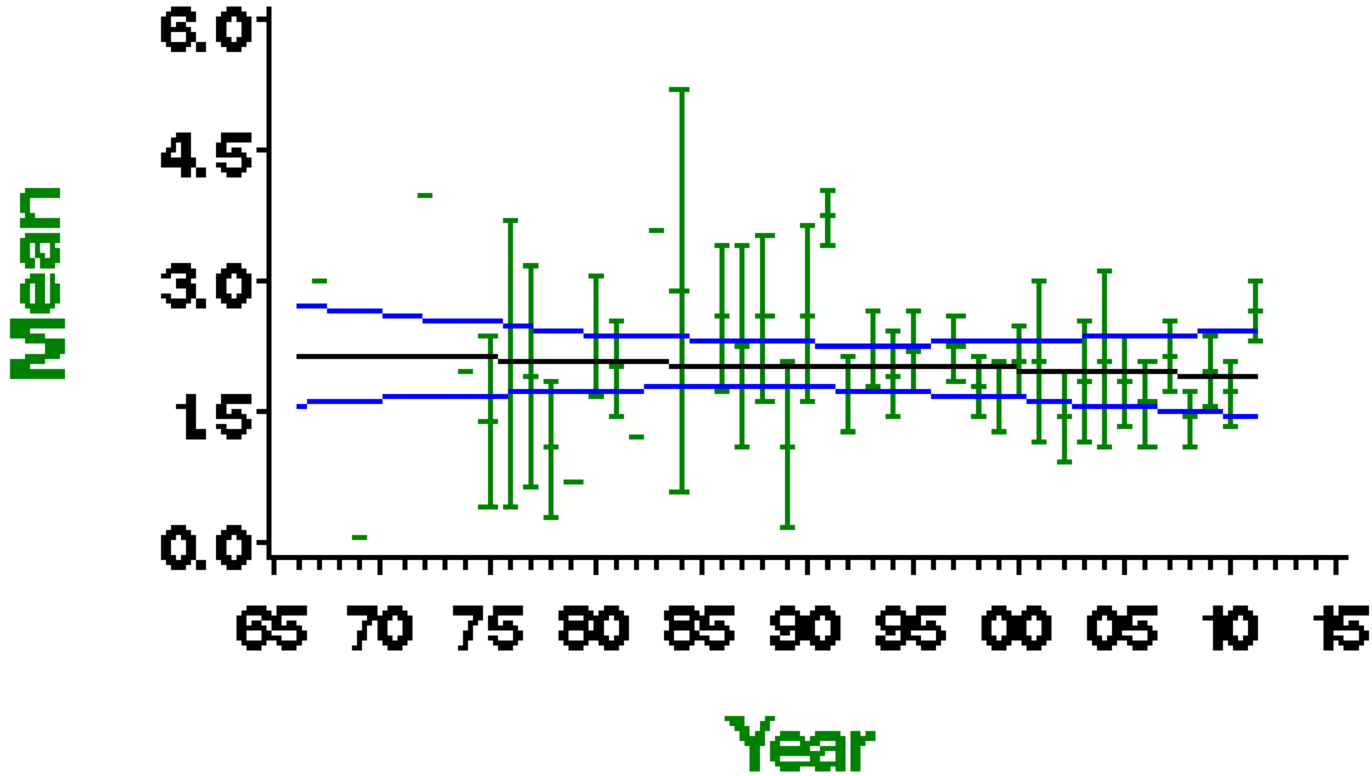
This species is too rare and restricted in range for population changes to be monitored annually by BTO volunteer surveys. A 62% reduction occurred in the number of 10-km squares occupied between 1968-72 and 1988-91; the species had ceased to breed in Wales and in several southern English counties over this period (Gibbons et al. 1993). Sitters et al. (1996) report that the UK population increased from c.250 pairs in 1986 to c.600 pairs in 1993, probably helped by mild winters and increased habitat availability due to storm damage in plantations, forest restocking, and heathland management. A repeat national survey in 1997 showed that the population had increased further, accompanied by expansion of the range into new areas (Wotton & Gillings 2000; for more information, click here). A further repeat in 2006 recorded an increase since 1997 of 88% accompanied by major range expansion, with a pair breeding in Wales for the first time since 1981 (Conway et al. 2009; also Wright et al. 2007). Climate change may benefit Woodlark, because it is able to make more nesting attempts in warmer years (Wright et al. 2009). The cold 2009/10 winter may, however, have brought about the small reduction in numbers reported to RBBP for 2010 (Holling & RBBP 2012). The small NRS sample suggests that nest failure rates have become less frequent at the egg stage. There has been no trend, however, in the number of fledglings per breeding attempt. Human disturbance at heathland sites apparently reduces population density, but the effects are partly offset by higher breeding productivity at lower densities (Mallord et al. 2007). The species' partial recovery in numbers and range resulted in a move from the red to the amber list at the 2009 review (Eaton et al. 2009). There has been little long-term change across Europe since 1980 (PECBMS 2012a).

Population changes in detail

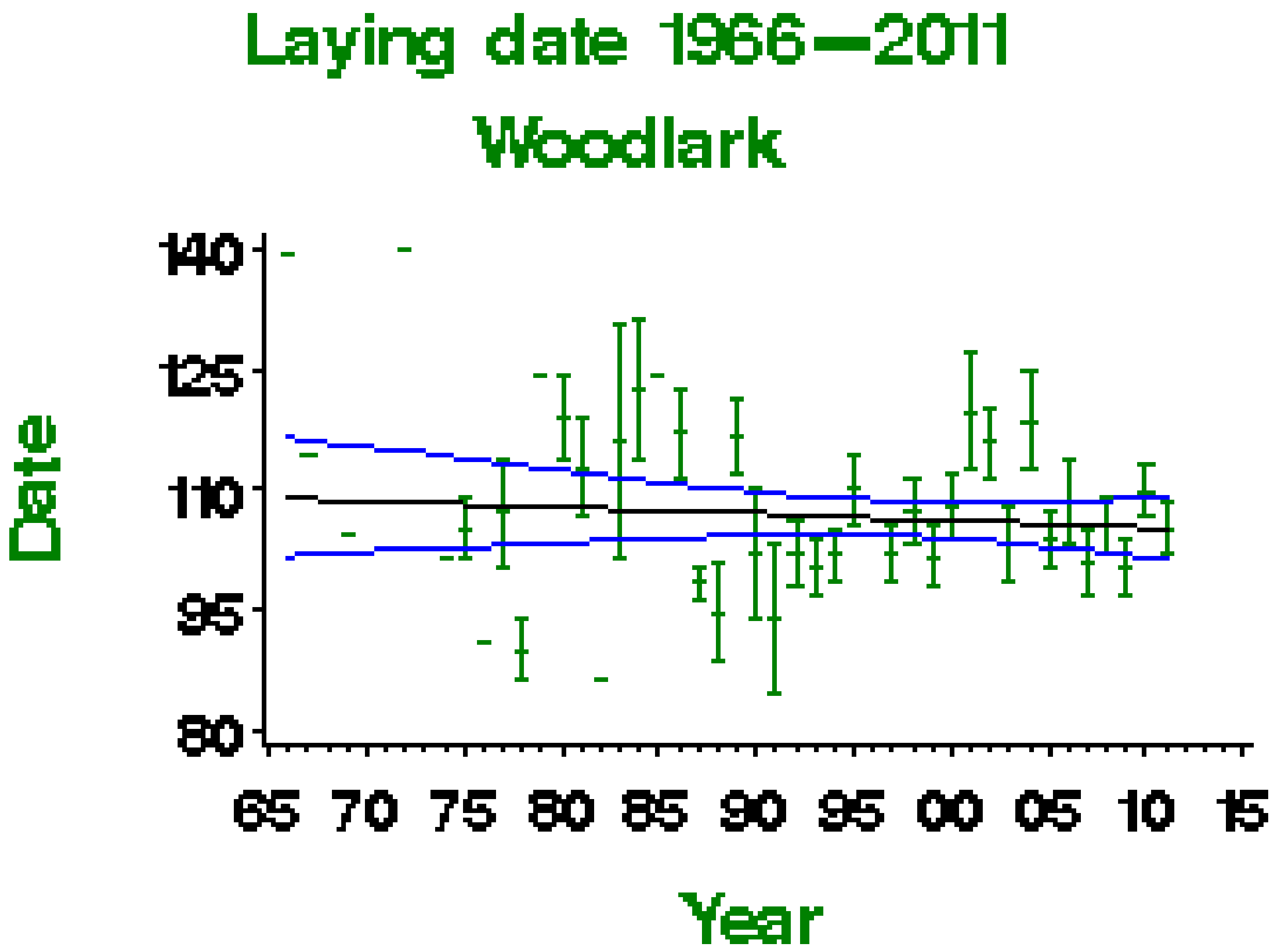
Annual breeding population changes for this species are not currently monitored by BTO

Demographic trends

Fledglings per breeding attempt 1966—2011 Woodlark



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

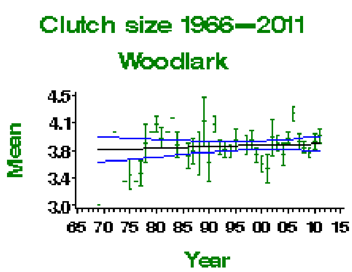


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

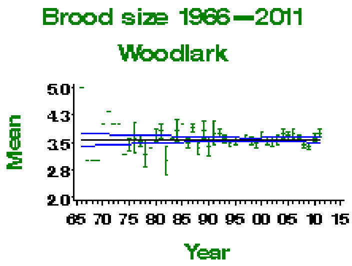
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	21	None					
Clutch size	42	1968-2010	20	None					Small sample
Brood size	42	1968-2010	32	None					
Nest failure rate at egg stage	42	1968-2010	22	Curvilinear	6.40% nests/day	2.73% nests/day	-57.3%		Small sample
Nest failure rate at chick stage	42	1968-2010	33	None					
Laying date	42	1968-2010	22	None			0 days		Small sample

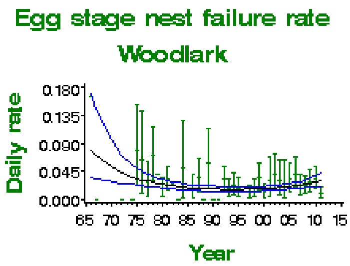
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



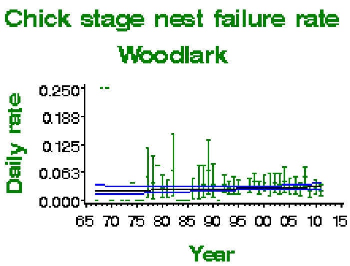
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Skylark

Alauda arvensis

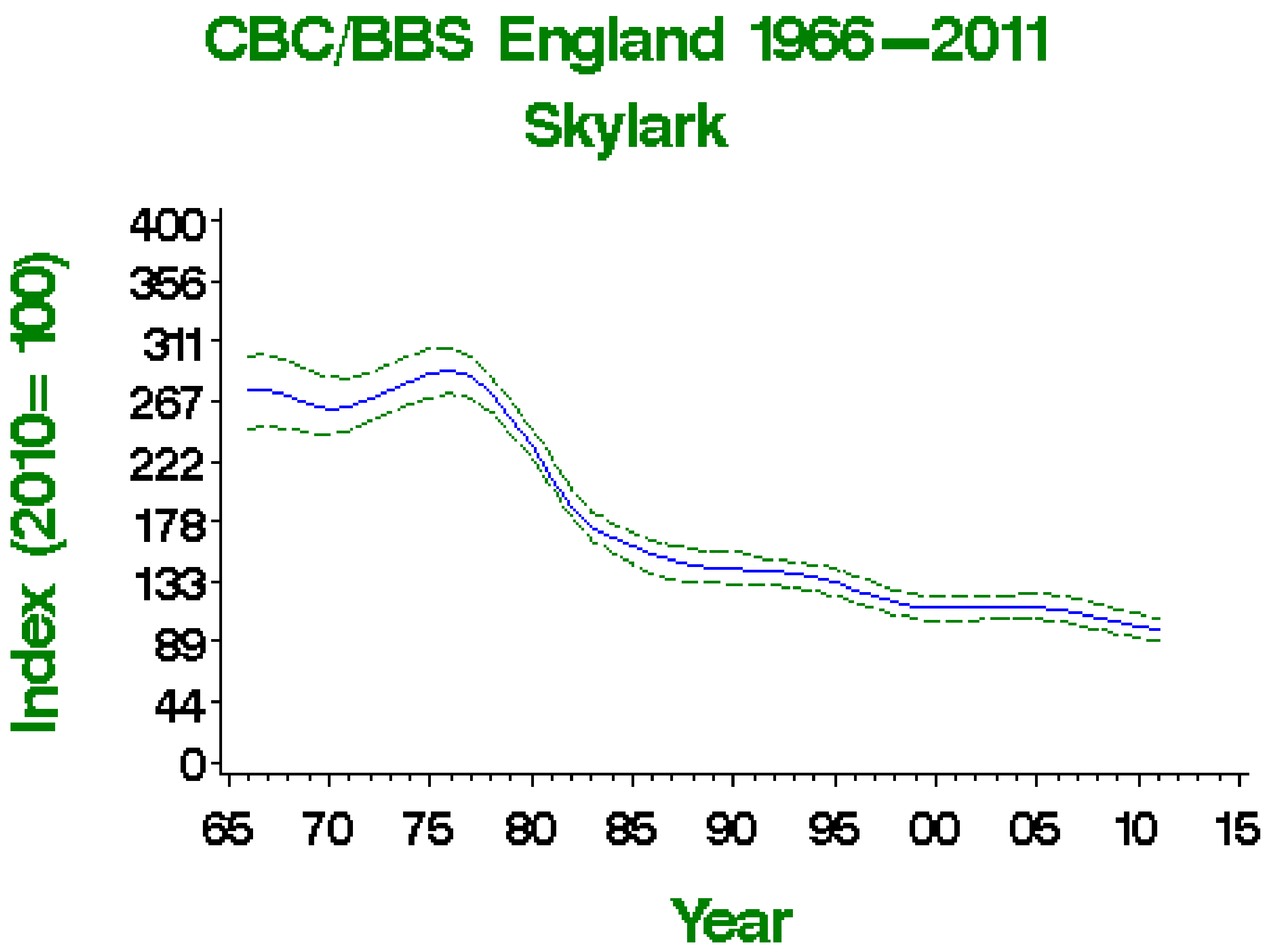
Key facts

Conservation listings:	Europe: SPEC category 3 (depleted) (BiE04) UK: red (species level, race arvensis); amber (race scotica, >20% of European breeders) (BoCC3) UK Biodiversity Action Plan: click here, priority species
Long-term trend:	England: rapid decline
Population size:	1.5 million territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend for England)

Migrant status:	Resident
Nesting habitat:	Ground nester
Primary breeding habitat:	Farmland
Secondary breeding habitat:	
Breeding diet:	Animal
Winter diet:	Animal

Status summary

The Skylark declined rapidly from the mid 1970s until the mid 1980s, when the rate of decline slowed. BBS data show further decline, recently extending to Scotland. The BBS PECBMS 2012a).



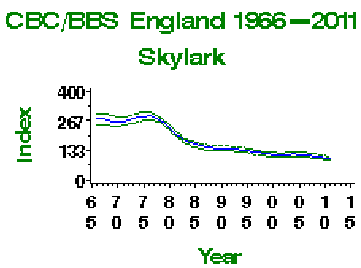
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

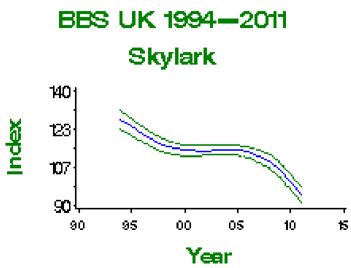
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	43	1967-2010	579	-64	-69	-56	>50	
	25	1985-2010	912	-37	-44	-29	>25	
	10	2000-2010	1493	-12	-16	-8		
	5	2005-2010	1702	-13	-16	-10		
BBS UK	15	1995-2010	1674	-20	-24	-13		
	10	2000-2010	1790	-12	-18	-7		
	5	2005-2010	2002	-12	-15	-9		
BBS England	15	1995-2010	1331	-24	-28	-21		
	10	2000-2010	1436	-12	-16	-8		
	5	2005-2010	1618	-12	-15	-9		
BBS Scotland	15	1995-2010	204	-9	-20	9		
	10	2000-2010	204	-6	-17	8		
	5	2005-2010	229	-12	-17	-3		
BBS Wales	15	1995-2010	103	-15	-32	0		
	10	2000-2010	112	-17	-31	0		
	5	2005-2010	118	-11	-21	0		
BBS N.Ireland	15	1995-2010	34	-43	-55	-34	>25	
	10	2000-2010	36	-54	-66	-48	>50	
	5	2005-2010	35	-30	-40	-22	>25	

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

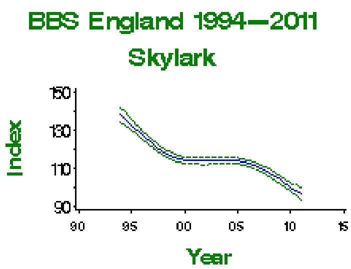
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



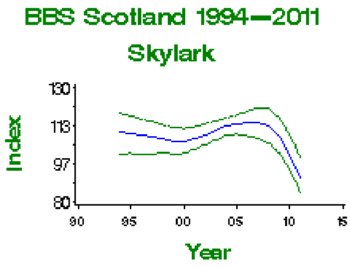
CBC/BBS England graph



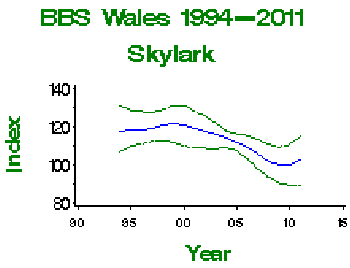
BBS UK graph



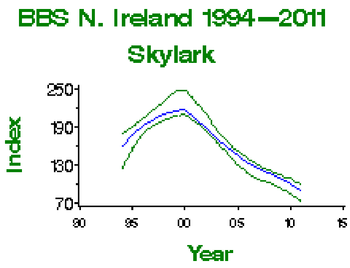
BBS England graph



BBS Scotland graph

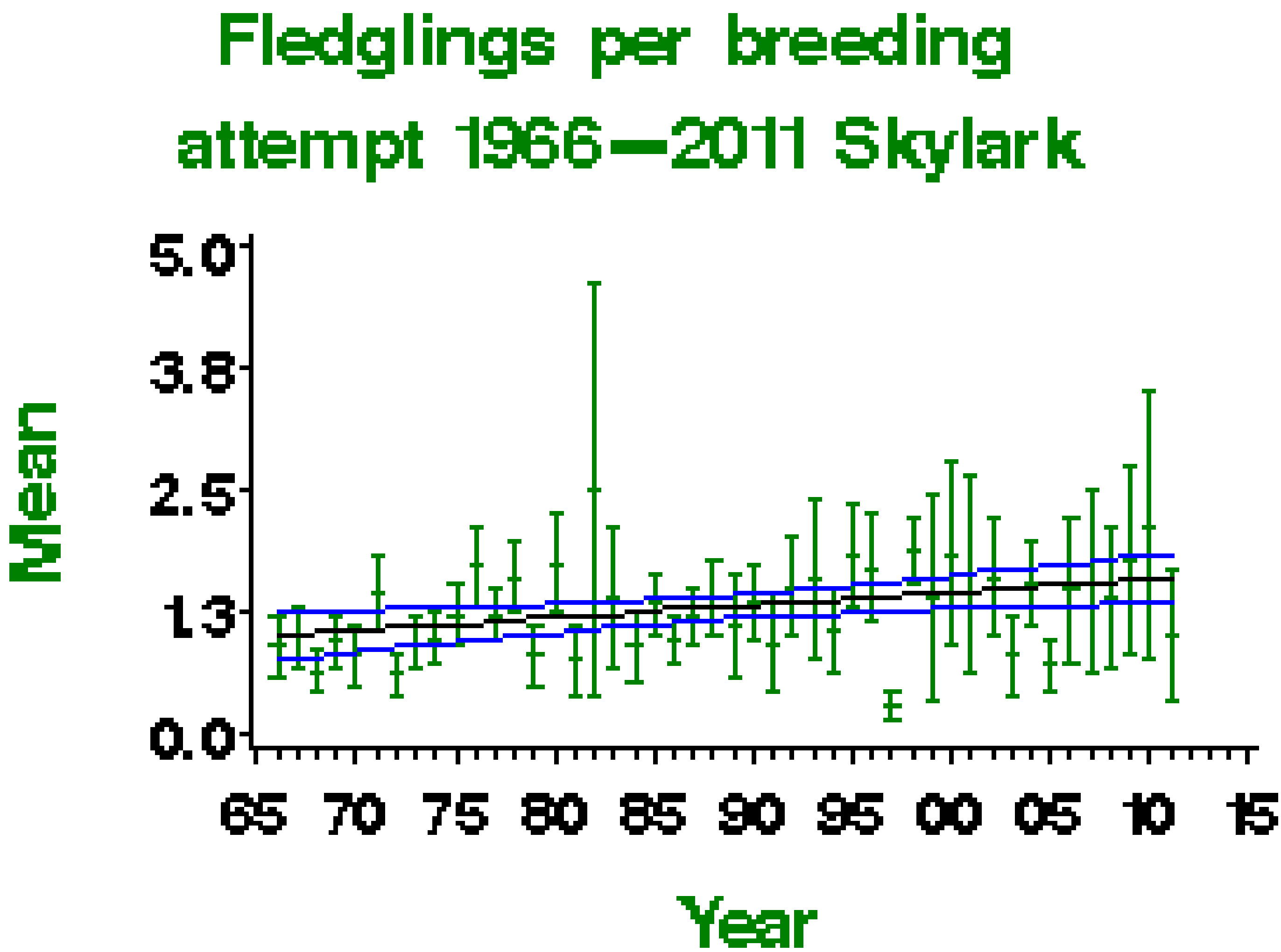


BBS Wales graph

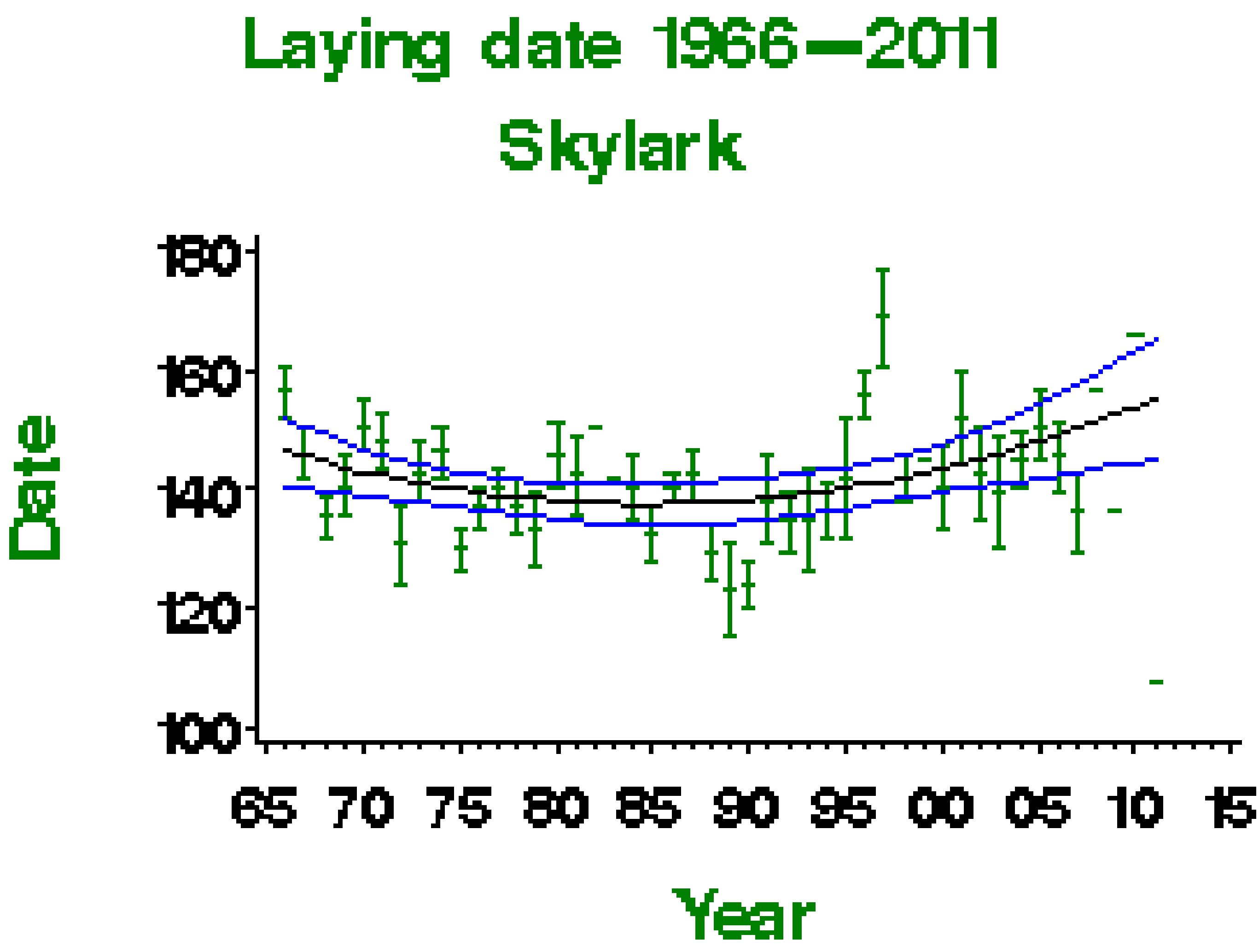


BBS N.Ireland graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend



Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

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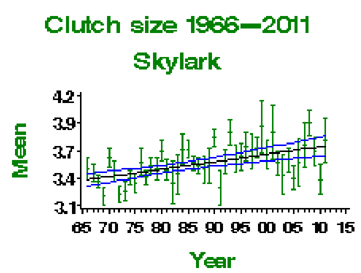
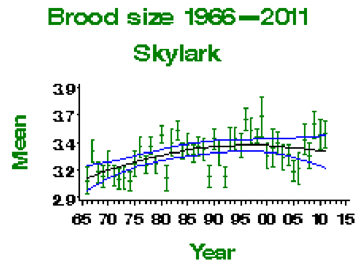
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	42	Linear increase	1.04 fledglings	1.60 fledglings	53.6%		
Clutch size	42	1968-2010	36	Linear increase	3.38 eggs	3.69 eggs	9.3%		
Brood size	42	1968-2010	65	Curvilinear	3.11 chicks	3.32 chicks	6.7%		
Nest failure rate at egg stage	42	1968-2010	44	None					
Nest failure rate at chick stage	42	1968-2010	53	Linear decline	4.82% nests/day	3.01% nests/day	-37.6%		
Laying date	42	1968-2010	19	Curvilinear	May 25	Jun 3	9 days		Small sample

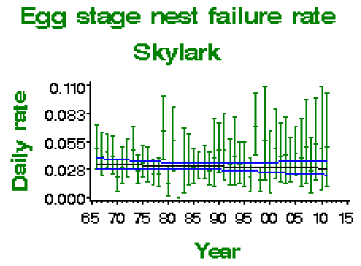
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



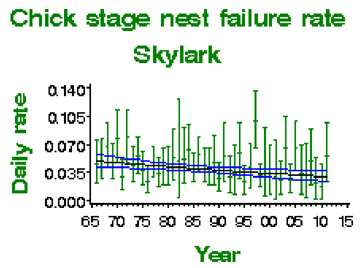
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

Causes of change

There is good evidence to indicate that the most likely cause of declines in Skylark is agricultural intensification, specifically the change from spring to autumn sowing of cereals, which reduces the number of breeding attempts possible and may also reduce overwinter survival due to loss of winter stubbles.

Change factor	Primary driver	Secondary driver
Demographic	Reduced breeding succes	
Ecological	Agricultural intensification	

Further information on causes of change

Demographic trends presented here show that there has been a general increase in the number of fledglings per breeding attempt, because clutch size and brood size have increased while the daily failure rate of nests at the chick stage has gone down. Chamberlain & Crick (1999) and Siriwardena et al. (2000b) found that breeding success per nesting attempt increased during the steepest period of decline, suggesting that these demographic changes have not contributed to the causes of population decline. The available data do not allow tests for effects of survival. Conversely, it is easy to test for effects on breeding success, especially locally and with respect to contemporary as opposed to historical land use. This creates a big imbalance in the amounts of evidence available.

Agricultural intensification has been put forward as the ultimate cause of Skylark declines. The relevant changes in agriculture have been decreases in preferred crops (spring cereals and cereal stubble) and an increase in unfavourable habitats (winter cereals, oilseed rape and intensively managed or grazed grass) (Chamberlain & Siriwardena 2000). There is good evidence that the most likely cause of the decline is the change from spring to autumn sowing of cereals. This practice restricts opportunities for late-season nesting attempts, because the crop is by then too tall. Chamberlain et al. (2000a) used habitat data from CBC surveys to show that the occurrence of autumn-sown, winter cereals increased from 33% to 78% between 1965 and 1995. Evans et al. (1995) and Wilson et al. (1997) all found that Skylarks deserted areas of autumn-sown crops as soon the sward reached a critical height, which occurred before the end of the breeding season. Jenny (1990), Chamberlain et al. (1999, 2000a, 2000b) and Donald & Vickery (2000) all recorded low and seasonally declining densities of Skylarks in cereals and suggested that this was at least partly due to the effects of changing vegetation structure. As well as preventing nesting, crop development also influences the positioning of the nests that are produced and hence their productivity: as the crop develops the birds are forced to nest closer to tramlines with a consequent increase in nest predation rate (Donald & Vickery 2000, Morris & Gilroy 2008). Analyses by Chamberlain & Crick (1999) provided detailed evidence from both regional and habitat-based analyses that the greatest declines in Skylark numbers were associated with agricultural habitat, although their evidence suggests that different patterns of decline were unlikely to be due to differences in breeding success per attempt between habitats. However, Siriwardena et al. (2001) showed that the population trend can be explained by national changes in crop areas, together with a cold winter in 1981/82.

There is also some evidence that the increase in autumn sowing may depress overwinter survival by reducing the area of stubbles (Wilson et al. 1997, Donald & Vickery

2000, 2001). Donald & Vickery (2001) used data from BTO and RSPB studies to show that, in winter, cereal stubbles were strongly selected by Skylarks, probably owing to the presence of spilt grain and regenerating weeds, and go on to state that the area of stubbles has declined greatly in recent years. Gillings et al. (2005) identified better population performance in areas with extensive winter stubble, presumably because overwinter survival is relatively high. Note, however, that definitive evidence about Skylark survival rates and what may have influenced them is not available because the species is rarely ringed and ring-recovery sample sizes are extremely small.

Use of pesticides and associated declines as declines in weed populations and weed-seed abundance have been suggested as another factor in the decline of Skylarks (Wilson 2001). Wilson et al. (1997) found higher densities of Skylarks in organic systems. Chamberlain & Crick (1999) suggest that the use of toxic pesticides mediated through effects on food supplies may be responsible for declines in invertebrate food, due to non-target insects being killed by insecticide and insect food-plants being killed by herbicide. However, since this would in theory affect breeding success, it doesn't seem to have been a problem. Donald et al. (2001) state that, although recent agricultural changes have affected diet and possibly body condition of nestlings, these effects are unlikely to have been an important factor in recent population declines. There may also be implications for overwinter survival, as herbicides reduce weeds, and hence seeds for the winter, making stubbles and uncropped land less valuable as a food resource. However, the increases in pesticide use have happened at the same time as the switch to autumn sowing, so is hard to detect this as a specific effect.

There is some evidence to suggest that high densities of raptors may reduce the abundance of local Skylark populations (Amar et al. 2008b). Chamberlain & Crick (1999) state that recovery of Sparrowhawk numbers has been most evident in the most intensively farmed areas, and that this is correlated with the declines in Skylark numbers across habitats and regions. However, this apparent link cannot be taken as evidence of a causal relationship as there have been many other broad-scale changes in the countryside that are at least as well correlated with Skylark changes. They state that it is doubtful whether predation alone could account for the decreases in Skylark numbers.

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Sand Martin

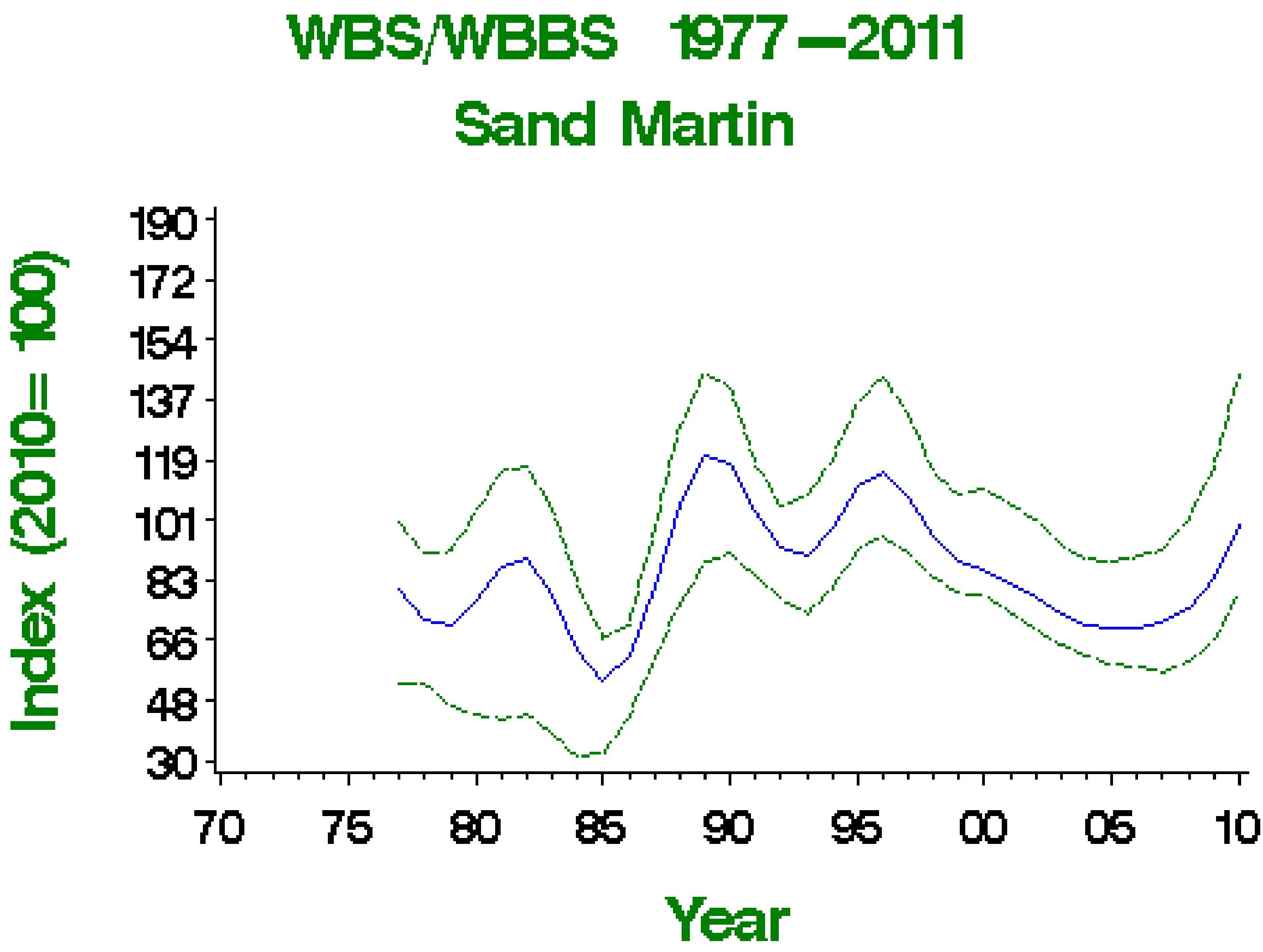
Riparia riparia

Key facts

Conservation listings:	Europe: SPEC category 3 (depleted) (BiE04) UK: amber (European status) (BoCC3)
Long-term trend:	UK: fluctuating, with no long-term trend
Population size:	54,000-174,000 nests in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Status summary

This species is unusually difficult to monitor, because active and inactive nest holes are difficult to distinguish, and because whole colonies frequently disperse or shift to new locations as suitable sand cliffs are created and destroyed. WBS counts, which are of apparently occupied nest holes along riverbanks, suggest a stable or shallowly increasing population, with wide fluctuations, although the ongoing decrease since the late 1990s has been steep enough to raise BTO alerts. BBS counts, which are of birds seen, show clearly that large year-to-year changes occur, but do not yet reveal a clear long-term trend. Nest record samples are small, but indicate that nest failure rates have decreased enormously since the 1960s; clutch size has increased, but brood size has fallen and no trend can be detected in the numbers of fledglings per breeding attempt. Rainfall in the species' trans-Saharan wintering grounds prior to the birds' arrival promotes annual survival and thus abundance in the following breeding season (Szep 1995). Annual survival rates from RAS sites in the UK for 1990-2004 were correlated positively with minimum monthly rainfall during the wet season in West Africa (Robinson et al. 2008). More recently, it has been discovered that summer rainfall on the breeding grounds has a negative influence on survival rates through the following winter (Cowley & Siriwardena 2005).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

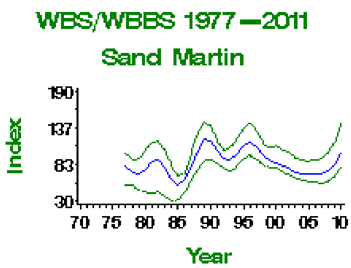
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
WBS/WBBS waterways	32	1978-2010	45	40	-9	181		
	25	1985-2010	53	87	20	371		

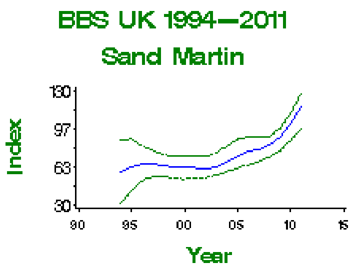
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	10	2000-2010	98	15	-20	70		
	5	2005-2010	94	45	9	97		
BBS UK	15	1995-2010	124	60	3	148		
	10	2000-2010	134	59	19	116		
	5	2005-2010	151	37	2	71		
BBS England	15	1995-2010	80	20	-21	48		
	10	2000-2010	86	2	-27	26		
	5	2005-2010	95	6	-16	25		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

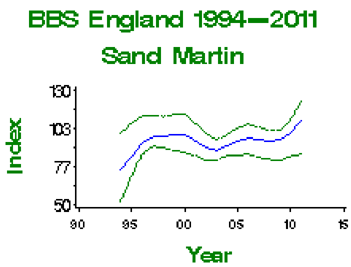
BTO JNCC rspb The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



WBS/WBBS waterways graph



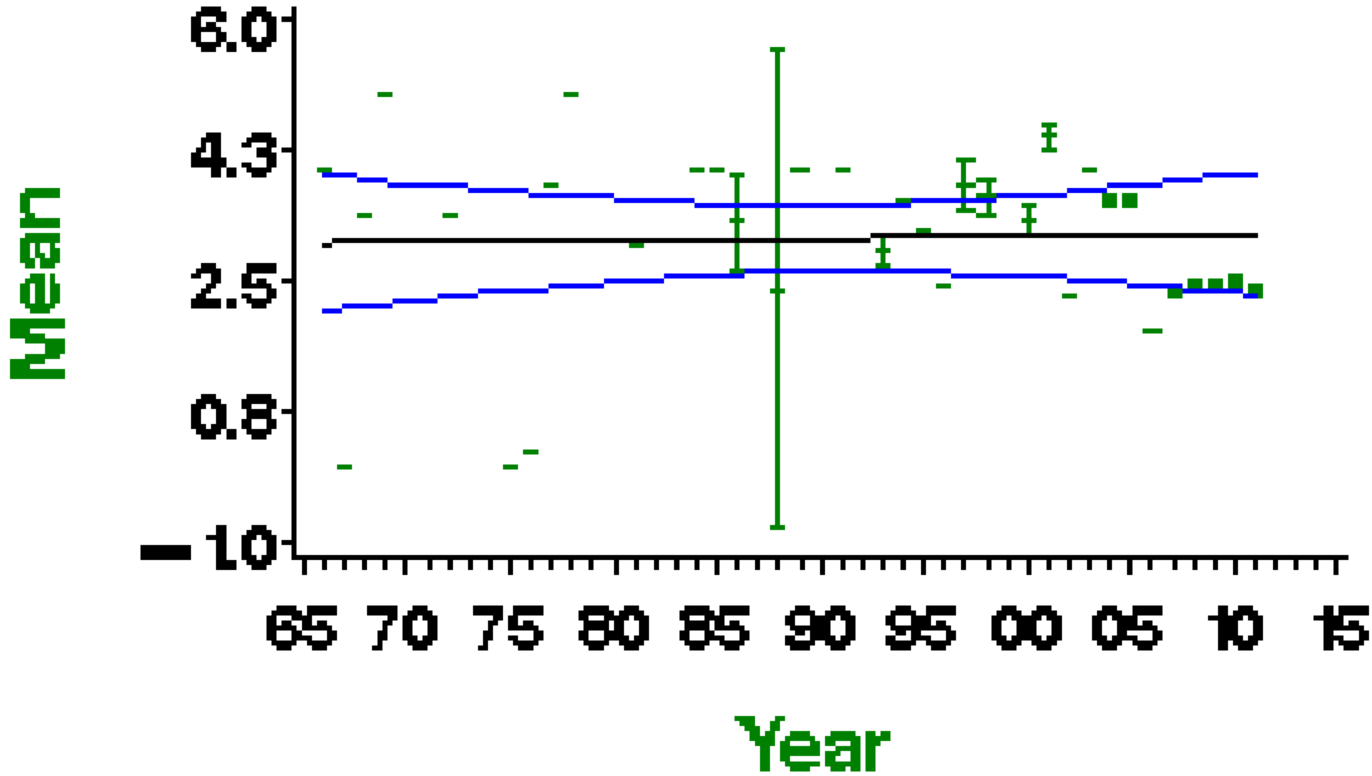
BBS UK graph



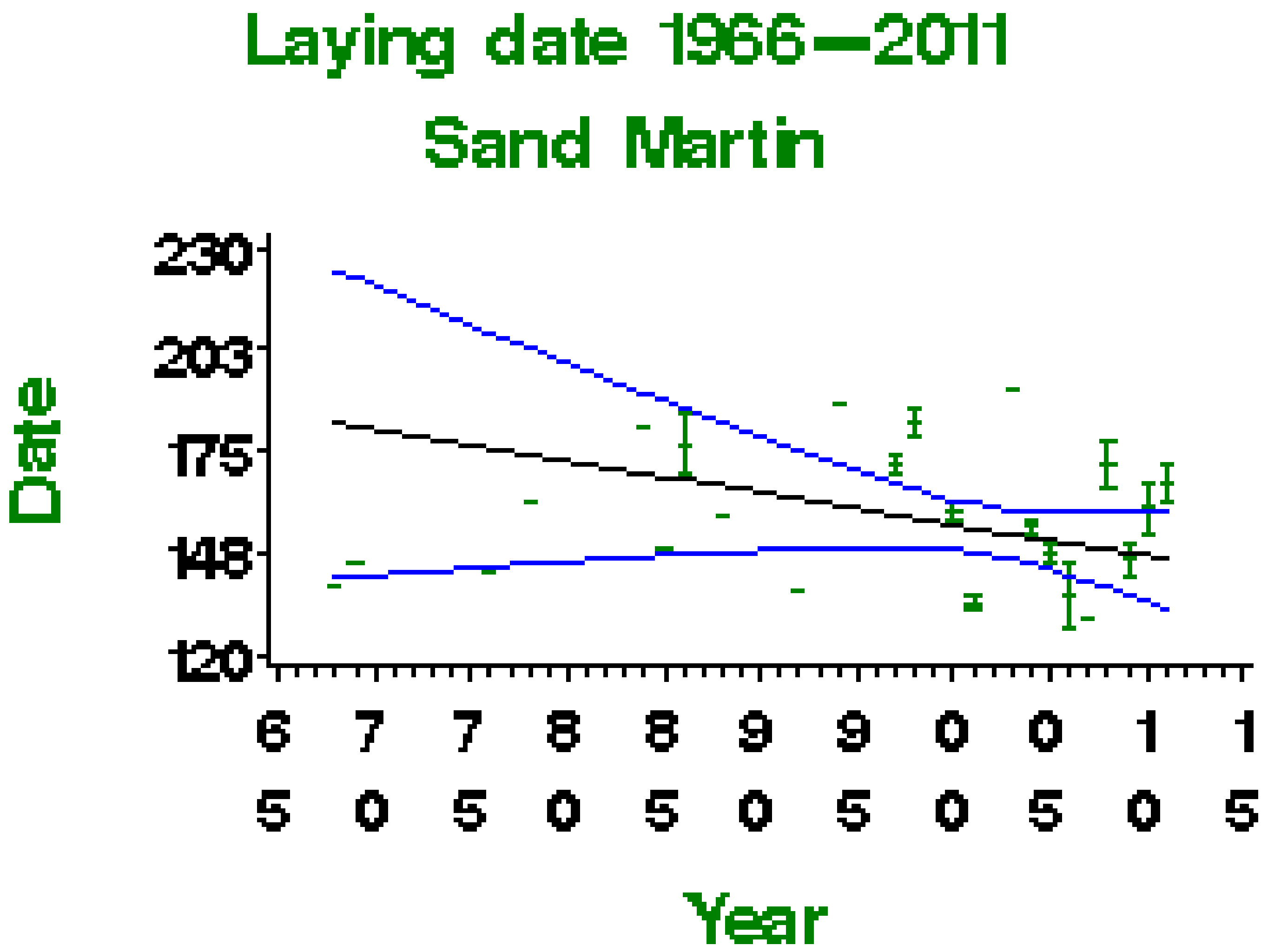
BBS England graph

Demographic trends

Fledglings per breeding attempt 1966—2011 Sand Martin



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

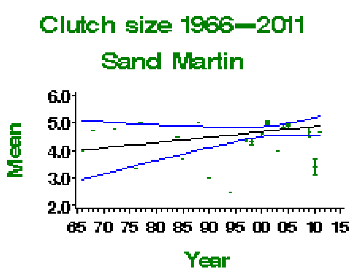


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

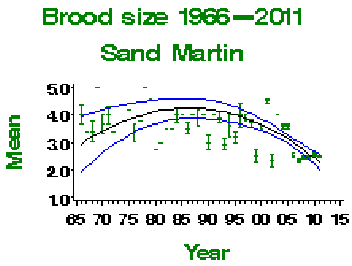
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	28	None					
Clutch size	42	1968-2010	30	None					Small sample
Brood size	42	1968-2010	50	Curvilinear	3.18 chicks	2.45 chicks	-22.9%		
Nest failure rate at egg stage	42	1968-2010	28	Linear decline	1.51% nests/day	0.00% nests/day	-100.0%		Small sample
Nest failure rate at chick stage	42	1968-2010	53	Linear decline	1.72% nests/day	0.04% nests/day	-97.7%		
Laying date	42	1968-2010	29	None			0 days		Small sample

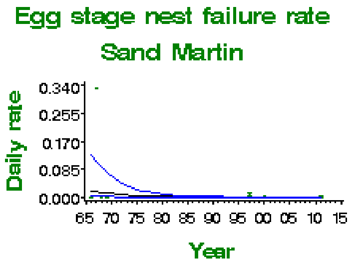
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



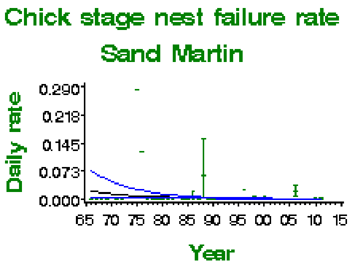
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



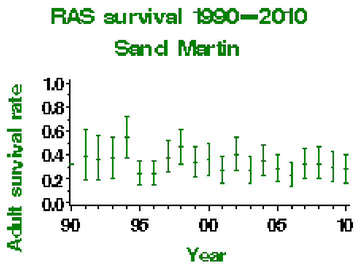
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of adult birds surviving to following year - error bars represent 95% confidence limits

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Swallow

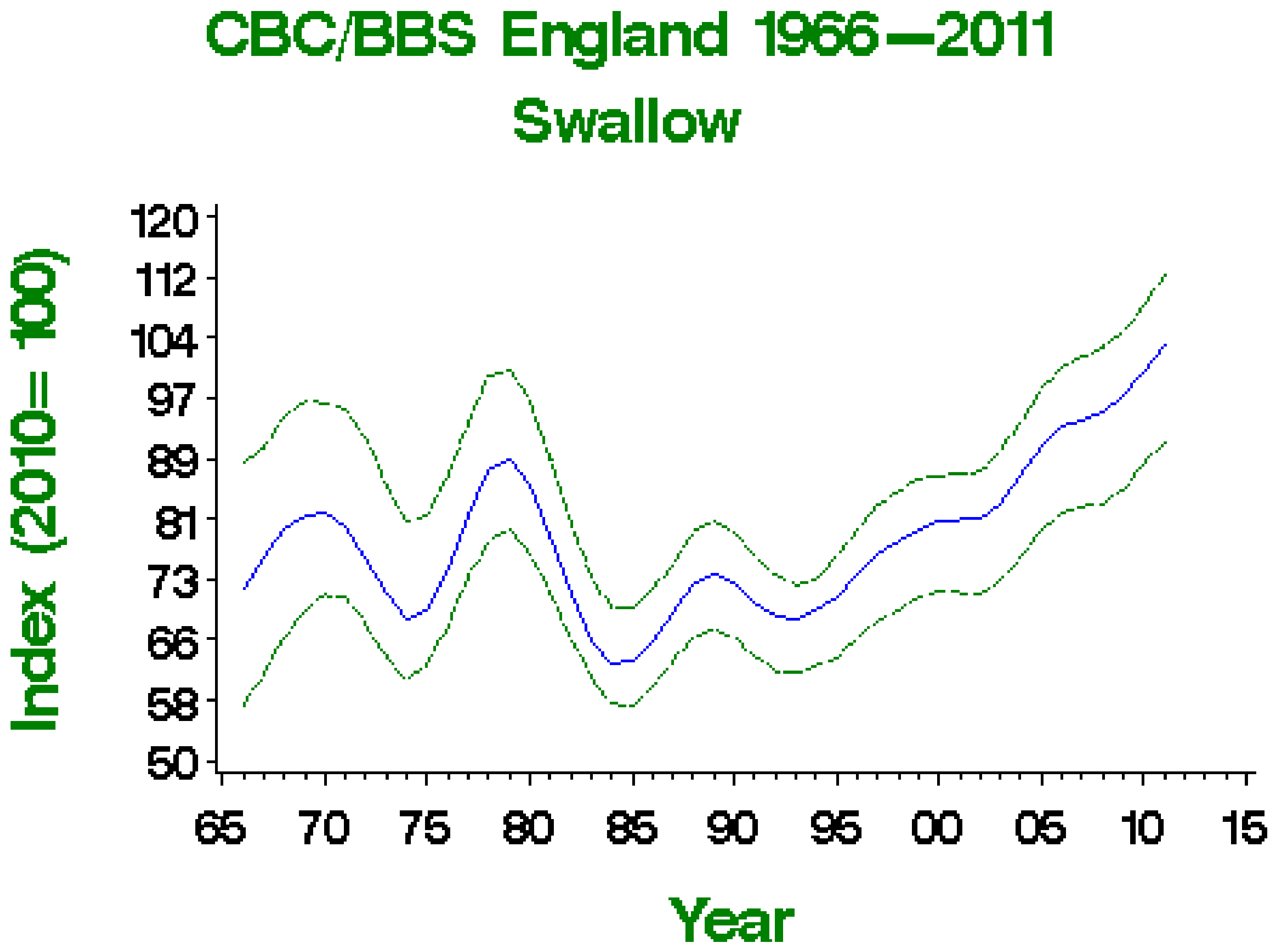
Hirundo rustica

Key facts

Conservation listings:	Europe: SPEC category 3 (depleted) (BiE04) UK: amber (European status) (BoCC3)
Long-term trend:	England: possible shallow increase
Population size:	860,000 territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend for England)

Status summary

Swallow was originally amber-listed partly on the strength of a perceived CBC decline, but continues to qualify through a widespread decline across the European continent (BirdLife International 2004). There has been little long-term change across Europe since 1980, but a moderate decrease since 1990 (PECBMS 2012a). Modern methods of estimating population change from CBC give evidence of fluctuations but not for long-term decline in the UK (Robinson et al. 2003). BBS data suggest increases throughout the UK since 1994. The BBS map of change in relative density between 1994-96 and 2007-09 indicates that decrease has occurred in that period in Northern Ireland and in eastern coastal regions of Britain, and increase most strongly in western Britain. Analysis has shown that the population fluctuations are most strongly related to variable losses on their wintering grounds (Baillie & Peach 1992). Population change has been shown to be correlated with rainfall in the western Sahel prior to the birds' spring passage through West Africa, but with neither cattle numbers nor nest-site availability in the UK (Robinson et al. 2003). Annual survival rates from RAS sites in the UK for 1998-2004 were correlated positively with mean monthly rainfall during the early austral summer in southern Africa (Robinson et al. 2008). It is likely that, in eastern parts of the UK, the loss of livestock farming and grazed grassland, together with arable intensification, has caused the Swallow population to decline, while an increase in the area of pasture in the west and north has promoted a population increase which apparently has more than compensated for declines elsewhere (Evans & Robinson 2004). A link between regional changes in the availability of preferred feeding habitats and the regional patterns of UK population change again suggests that habitat change on the breeding grounds may explain population trend, at least partly (Henderson et al. 2007). Clutch and brood sizes increased up to the late 1980s, and may now be falling again, while the numbers of fledglings per breeding attempt show no trend. Climatic warming is leading to both an earlier start and later finish to the breeding season for European Swallows, but there has been increased chick mortality in hot, dry summers and reduced post-fledging survival because of poor conditions for birds migrating through North Africa (Turner 2009).



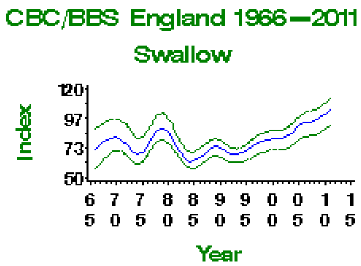
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

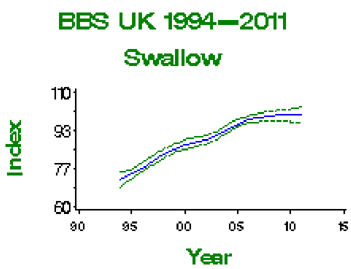
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	43	1967-2010	585	31	-8	82		
	25	1985-2010	960	59	29	92		
	10	2000-2010	1658	24	15	33		
	5	2005-2010	1916	11	6	15		
BBS UK	15	1995-2010	1887	35	28	43		
	10	2000-2010	2101	15	9	21		
	5	2005-2010	2389	4	-1	7		
BBS England	15	1995-2010	1453	37	28	47		
	10	2000-2010	1616	24	15	32		
	5	2005-2010	1854	11	5	15		
BBS Scotland	15	1995-2010	167	41	20	67		
	10	2000-2010	181	21	4	40		
	5	2005-2010	207	6	-4	18		
BBS Wales	15	1995-2010	170	26	8	46		
	10	2000-2010	192	-5	-16	9		
	5	2005-2010	206	-14	-24	0		
BBS N.Ireland	15	1995-2010	84	12	-8	45		
	10	2000-2010	98	-15	-28	-7		
	5	2005-2010	106	-16	-24	-9		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

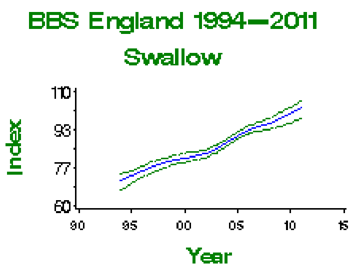
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



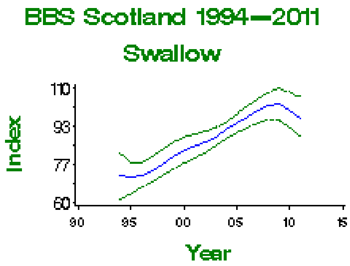
CBC/BBS England graph



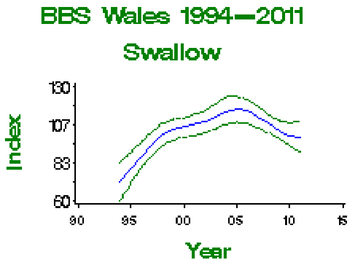
BBS UK graph



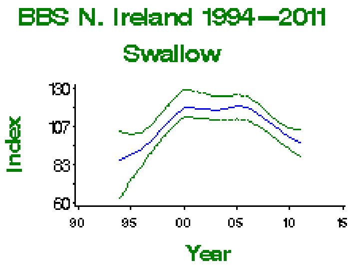
BBS England graph



BBS Scotland graph

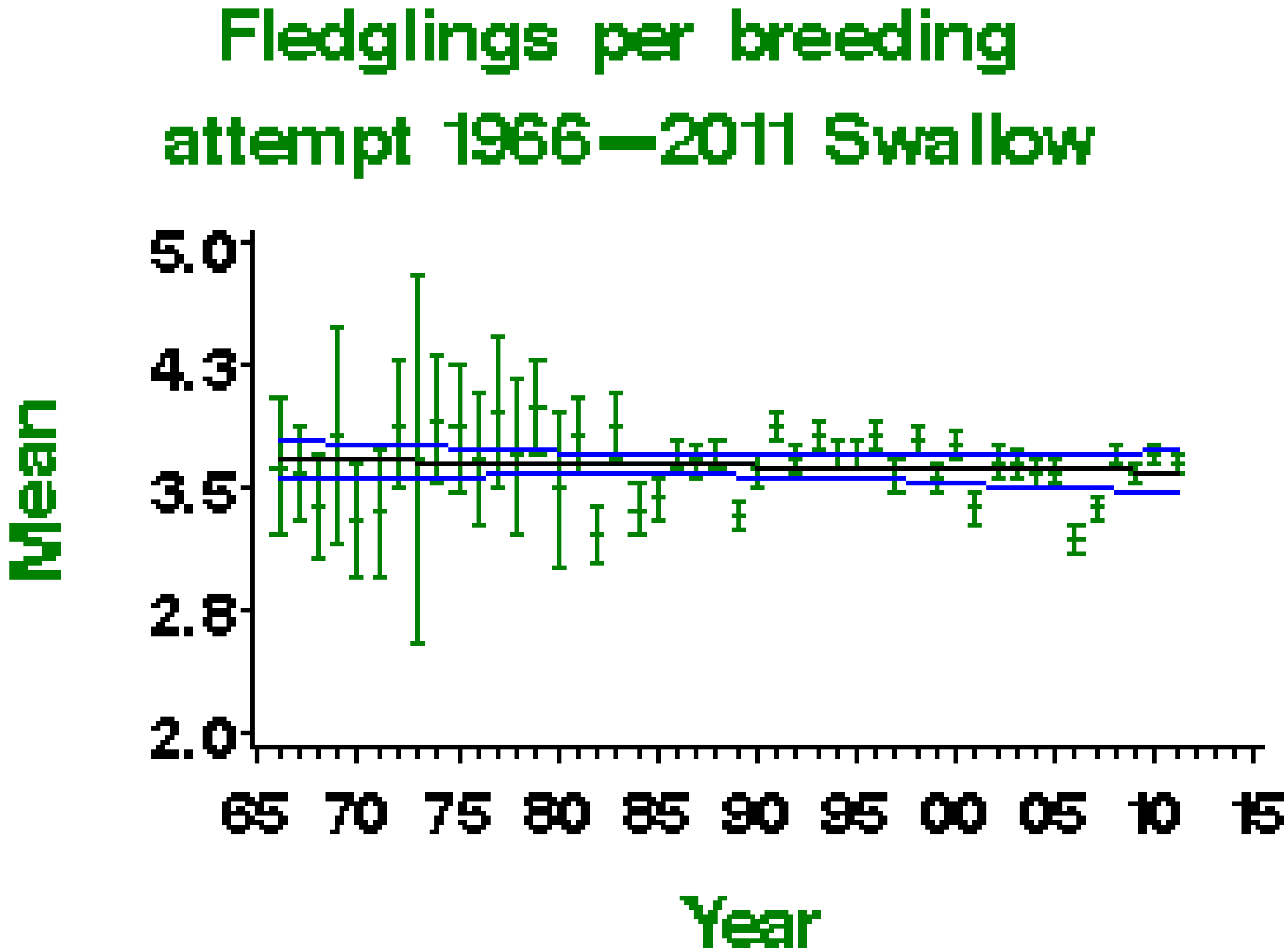


BBS Wales graph

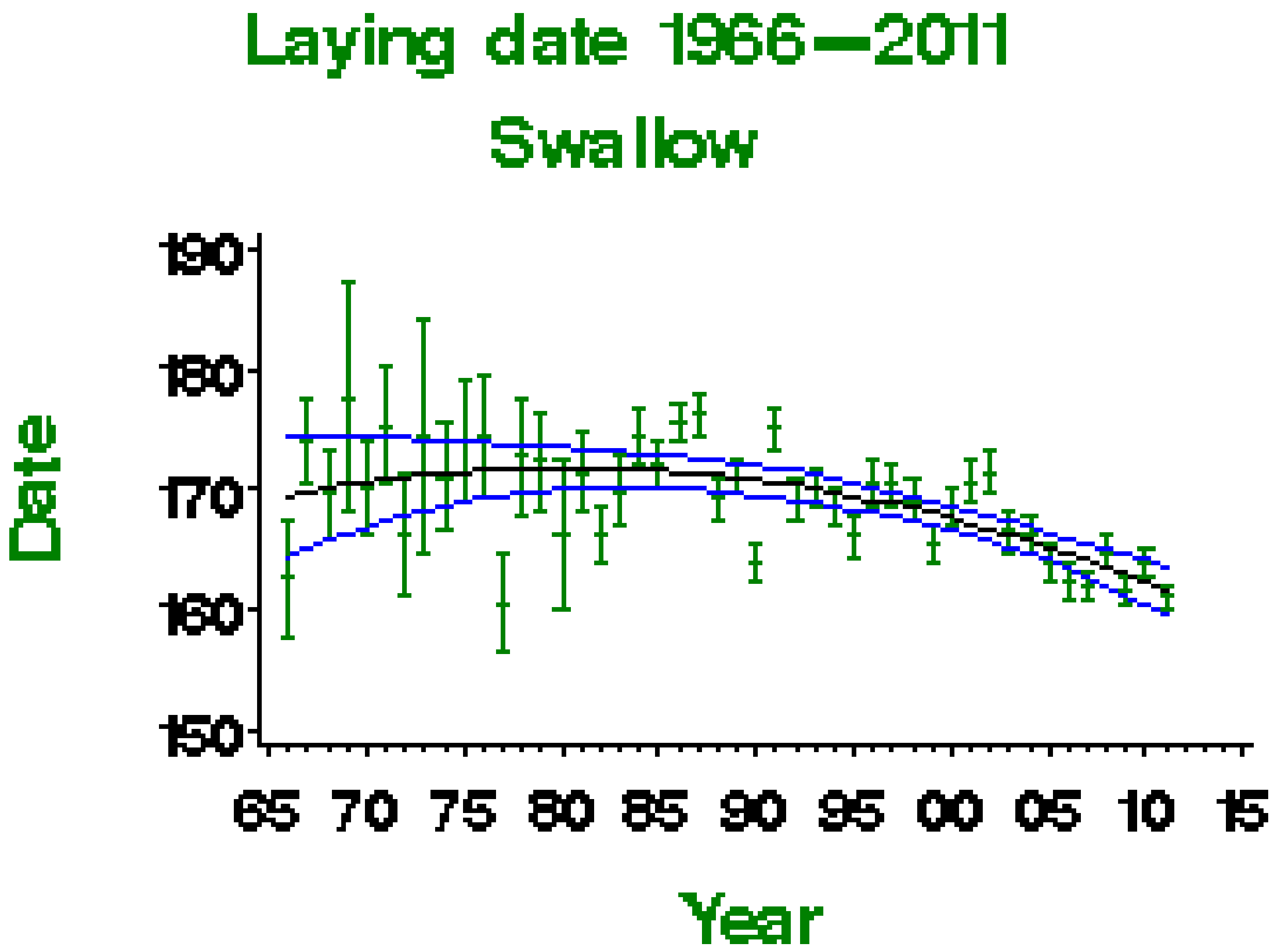


BBS N.Ireland graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend



Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

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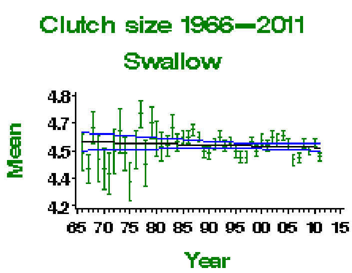
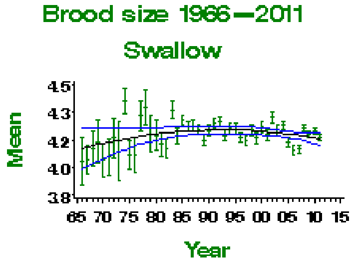
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	481	None					
Clutch size	42	1968-2010	454	None					
Brood size	42	1968-2010	789	Curvilinear	4.11 chicks	4.16 chicks	1.1%		
Nest failure rate at egg stage	42	1968-2010	559	None					
Nest failure rate at chick stage	42	1968-2010	482	Linear increase	0.30% nests/day	0.44% nests/day	46.7%		
Laying date	42	1968-2010	200	Curvilinear	Jun 19	Jun 11	-8 days		

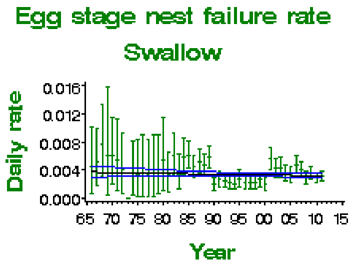
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



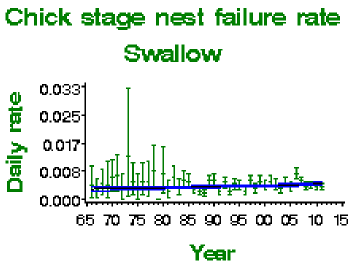
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



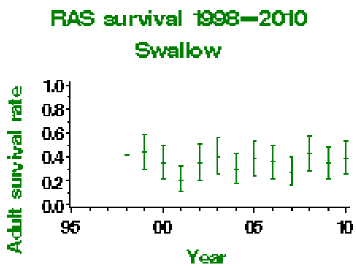
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of adult birds surviving to following year - error bars represent 95% confidence limits

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This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

House Martin

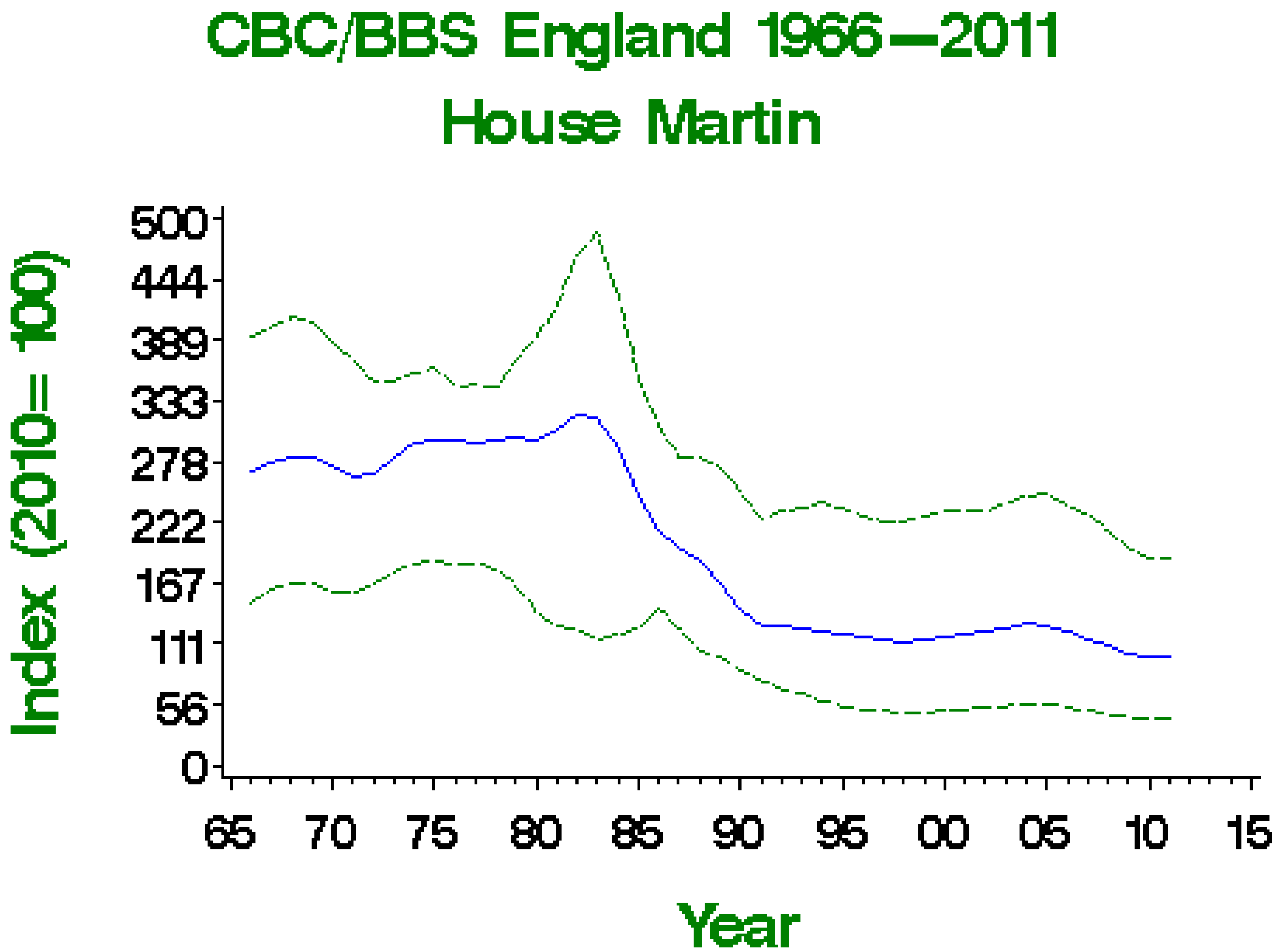
Delichon urbicum

Key facts

Conservation listings:	Europe: SPEC category 3 (declining) (BiE04) UK: amber (25-50% population decline) (BoCC3)
Long-term trend:	England: probable rapid decline
Population size:	510,000 (360,000-670,000) pairs in 2009 (APEP13: distance sampling estimate for 2006 (Newson et al. 2008) updated using BBS trend)

Status summary

The House Martin's loosely colonial nesting habits and its strong association with human settlements mean that it is extraordinarily difficult to monitor. Anecdotal evidence of decline is often unreliable, because demise of a colony may be balanced by single nests or small groups becoming established elsewhere. For these reasons, study areas should be large, covered thoroughly, and ideally randomly selected. The available long-term data suggest a rapid decline, although BBS's first decade or so showed an increase. The BBS BirdLife International 2004). There has been widespread moderate decrease across Europe since 1980, though with little change since 1990 (PECBMS 2012a). Annual survival rates from RAS sites in the UK for 1994-2004 were correlated positively with maximum monthly rainfall in West Africa; some decline in survival rate is apparent over this period but does not correspond to the population decline (Robinson et al. 2008).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

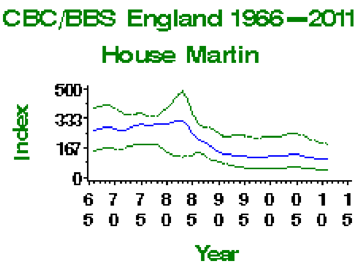
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	43	1967-2010	280	-64	-89	41		Small CBC sample
	25	1985-2010	467	-59	-88	62		Small CBC sample
	10	2000-2010	802	-15	-25	-8		
	5	2005-2010	879	-22	-30	-17		

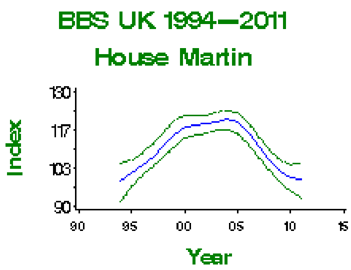
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	15	1995-2010	912	-2	-10	8		
	10	2000-2010	1009	-15	-22	-7		
	5	2005-2010	1095	-16	-21	-10		
BBS England	15	1995-2010	725	-14	-23	-5		
	10	2000-2010	791	-14	-21	-7		
	5	2005-2010	862	-20	-25	-15		
BBS Scotland	15	1995-2010	61	104	43	168		
	10	2000-2010	68	-15	-38	14		
	5	2005-2010	79	-5	-23	24		
BBS Wales	15	1995-2010	87	8	-19	40		
	10	2000-2010	94	-23	-40	-1		
	5	2005-2010	94	-14	-32	12		
BBS N.Ireland	15	1995-2010	41	64	0	145		
	10	2000-2010	49	5	-22	53		
	5	2005-2010	55	4	-21	37		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

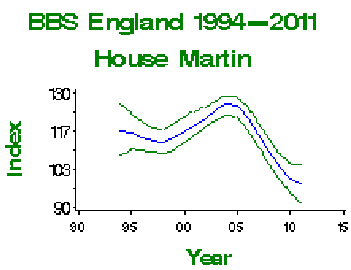
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



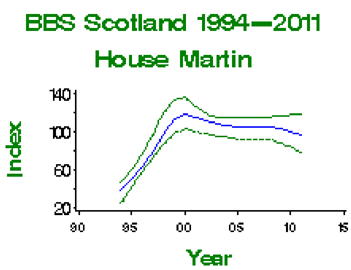
CBC/BBS England graph



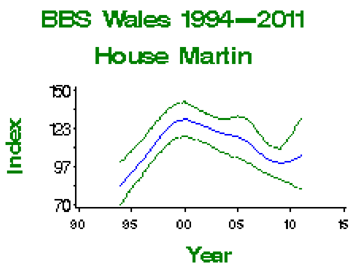
BBS UK graph



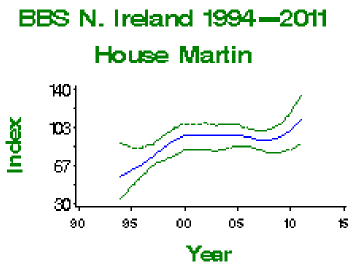
BBS England graph



BBS Scotland graph



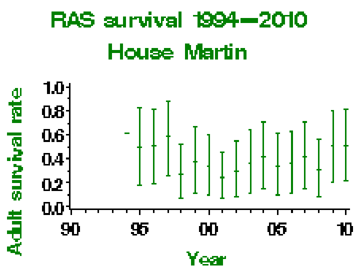
BBS Wales graph



BBS N.Ireland graph

Demographic trends

Productivity and survival trends for this species are not currently produced by BTO



Proportion of adult birds surviving to following year - error bars represent 95% confidence limits

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Cetti's Warbler

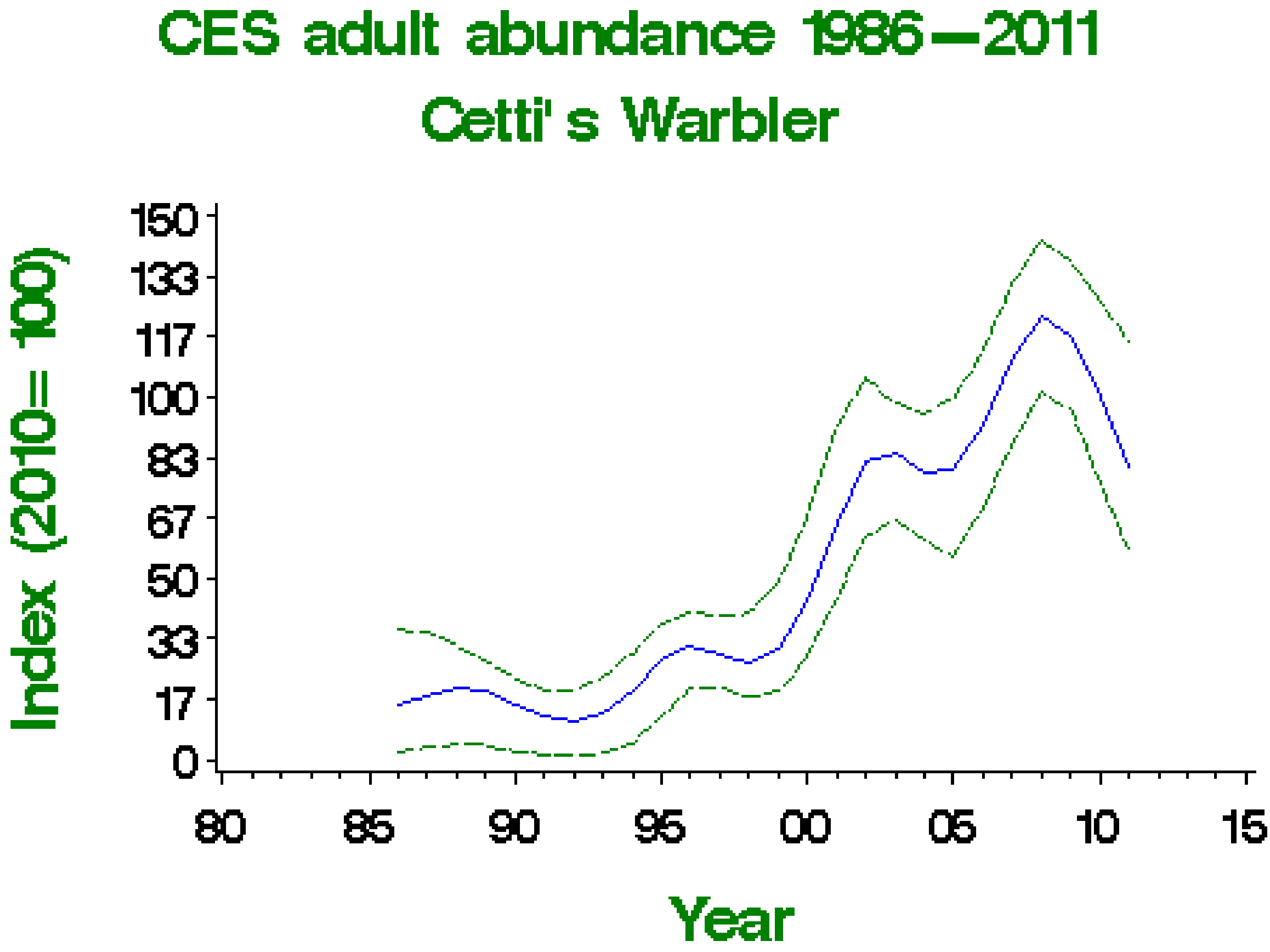
Cettia cetti

Key facts

Conservation listings:	Europe: no SPEC category (favourable conservation status in Europe, not concentrated in Europe) (BiE04) UK: green (BoCC3); an RBBP species
Long-term trend:	England, Wales: increase
Population size:	2,000 males in 2006-10 (APEP13: RBBP data)

Status summary

Cetti's Warblers were first recorded in Britain as recently as 1961, as part of a range expansion across northwest Europe (Bonham & Robertson 1975). Colonisation, which began in Kent in 1972 or 1973, continues to be monitored annually by Holling & RBBP 2012. Numbers and breeding range increased spectacularly during the first 12 years, with Norfolk and Dorset gradually overtaking Kent as the main host counties (Gibbons et al. 1993, Wotton et al. 1998). Severe winters after 1978 led to the temporary extinction of the Kent population in 1988. Populations in milder regions continued to grow, but overall the UK population fell by over a third between 1984 and 1986. In the absence of severe winters during 1986-2009, increase and range expansion continued. The first breeding records north of the Humber were made in 2006 (Holling & RBBP 2009). Much constant-effort ringing takes place in prime Cetti''s Warbler habitat; despite the comparative rarity of this species, therefore, CES population and productivity indices are already available (Robinson et al. 2007). CES data confirm the species'' sensitivity to cold winters, which appears to have become more evident as the breeding range has expanded into more testing climates. Numbers have shown a remarkably steep rate of increase across Europe since 1990, but no longer-term trend is available (PECBMS 2012a).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

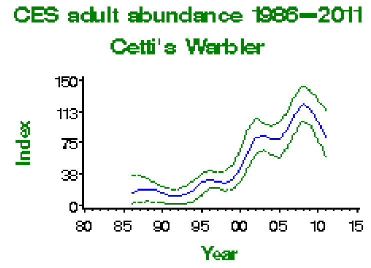
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CES adults	10	2000-2010	13	128	15	398		Small sample
	5	2005-2010	16	25	-7	101		Small sample

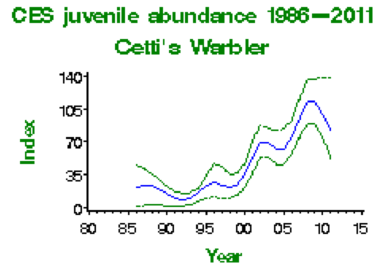
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CES juveniles	10	2000-2010	14	185	61	626		Small sample
	5	2005-2010	17	59	2	177		Small sample

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



CES adults graph



CES juveniles graph

Demographic trends

Productivity and survival trends for this species are not currently produced by BTO

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Long-tailed Tit

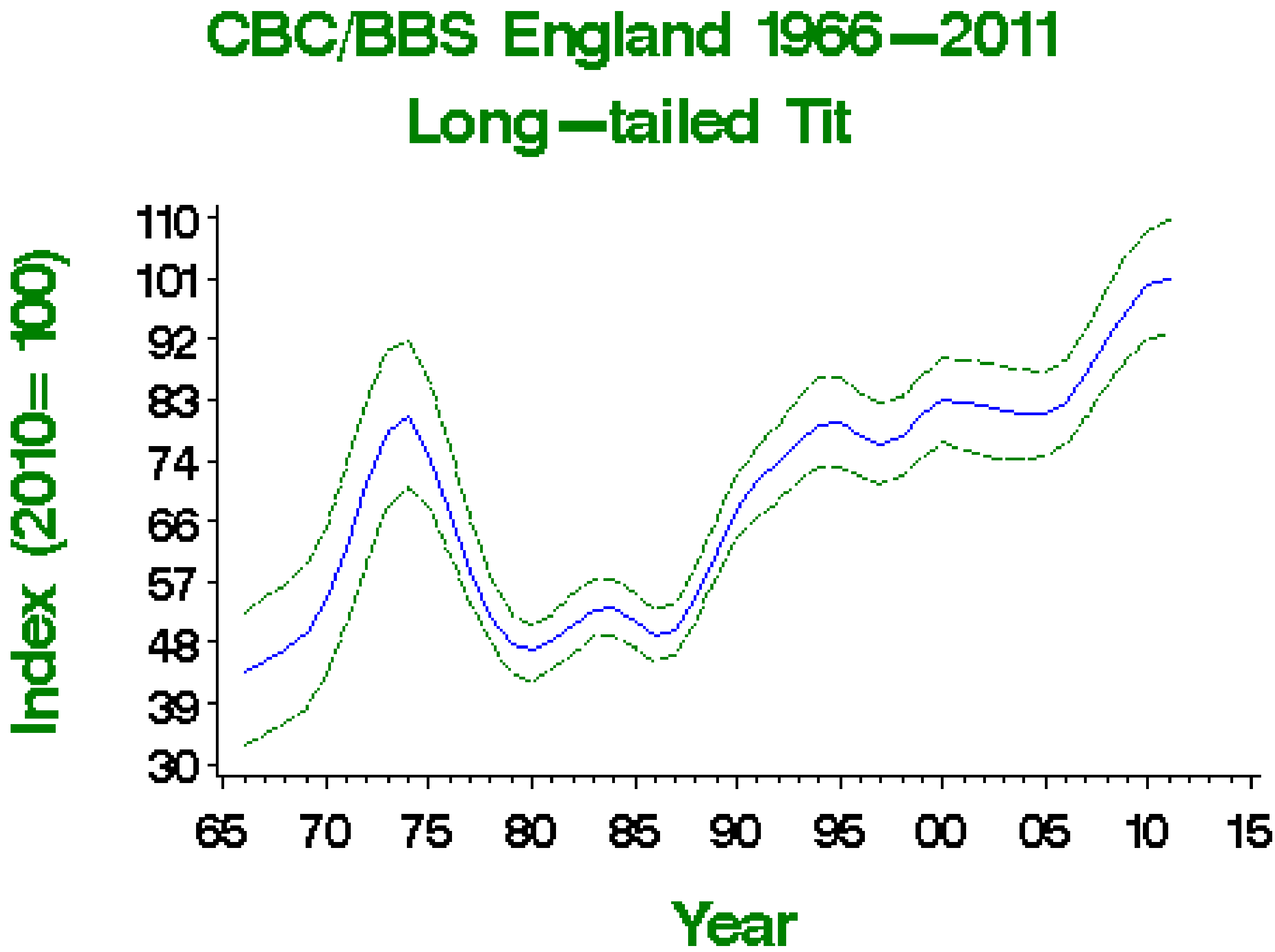
Aegithalos caudatus

Key facts

Conservation listings:	Europe: no SPEC category (not concentrated in Europe, conservation status favourable) (BiE04) UK: green (species level); amber (race *rosaceus*, >20% of European breeders) (BoCC3)
Long-term trend:	England: rapid increase
Population size:	340,000 territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend for England)

Status summary

This species undergoes wide fluctuations in numbers between breeding seasons, suffering heavy mortality when winters are severe, but is able to recover quickly by virtue of its high breeding potential. Numbers were low after the severe winters of the early 1960s and again during a series of relatively cold winters beginning in the late 1970s. The starting years of the 25-year and longest monitoring periods coincided with troughs in population, thus exaggerating the long-term trend. CBC/BBS index trends show progressive increases in Long-tailed Tit abundance beginning in the early 1980s. The BBS Crick & Sparks 1999). Numbers have shown widespread moderate increase across Europe since 1980, though with little change since 1990 (PECBMS 2012a).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	43	1967-2010	385	121	69	213		
	25	1985-2010	585	97	70	127		
	10	2000-2010	959	20	12	28		
	5	2005-2010	1108	23	18	30		

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CES adults	26	1984-2010	80	35	1	85		
	25	1985-2010	83	46	14	91		
	10	2000-2010	93	-1	-13	11		
	5	2005-2010	93	8	-5	22		
CES juveniles	26	1984-2010	75	93	30	193		
	25	1985-2010	77	137	62	258		
	10	2000-2010	89	2	-17	21		
	5	2005-2010	86	33	12	54		
BBS UK	15	1995-2010	923	27	17	38		
	10	2000-2010	1071	19	10	28		
	5	2005-2010	1248	22	15	29		
BBS England	15	1995-2010	812	22	12	34		
	10	2000-2010	942	21	13	30		
	5	2005-2010	1098	21	16	27		
BBS Wales	15	1995-2010	59	11	-13	42		
	10	2000-2010	66	7	-17	42		
	5	2005-2010	73	11	-11	32		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

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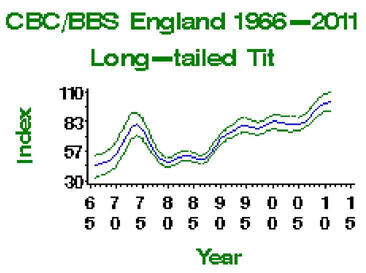
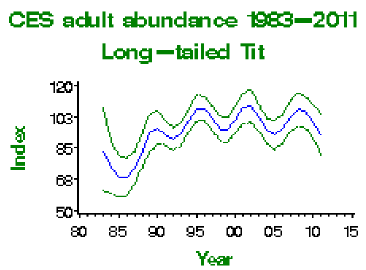
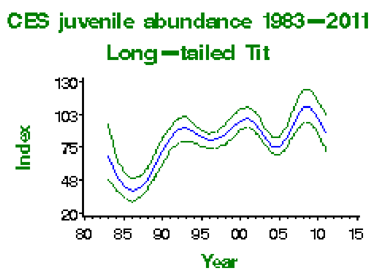


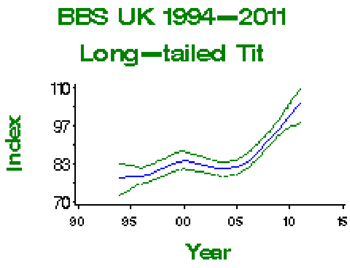
CBC/BBS England graph



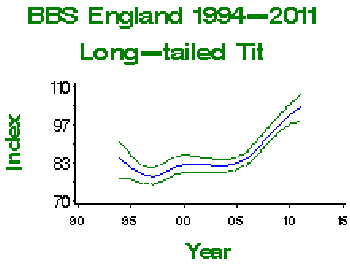
CES adults graph



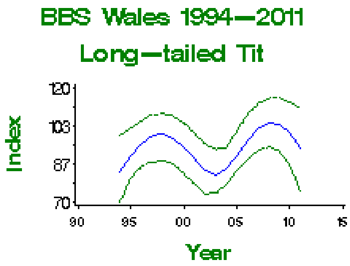
CES juveniles graph



BBS UK graph

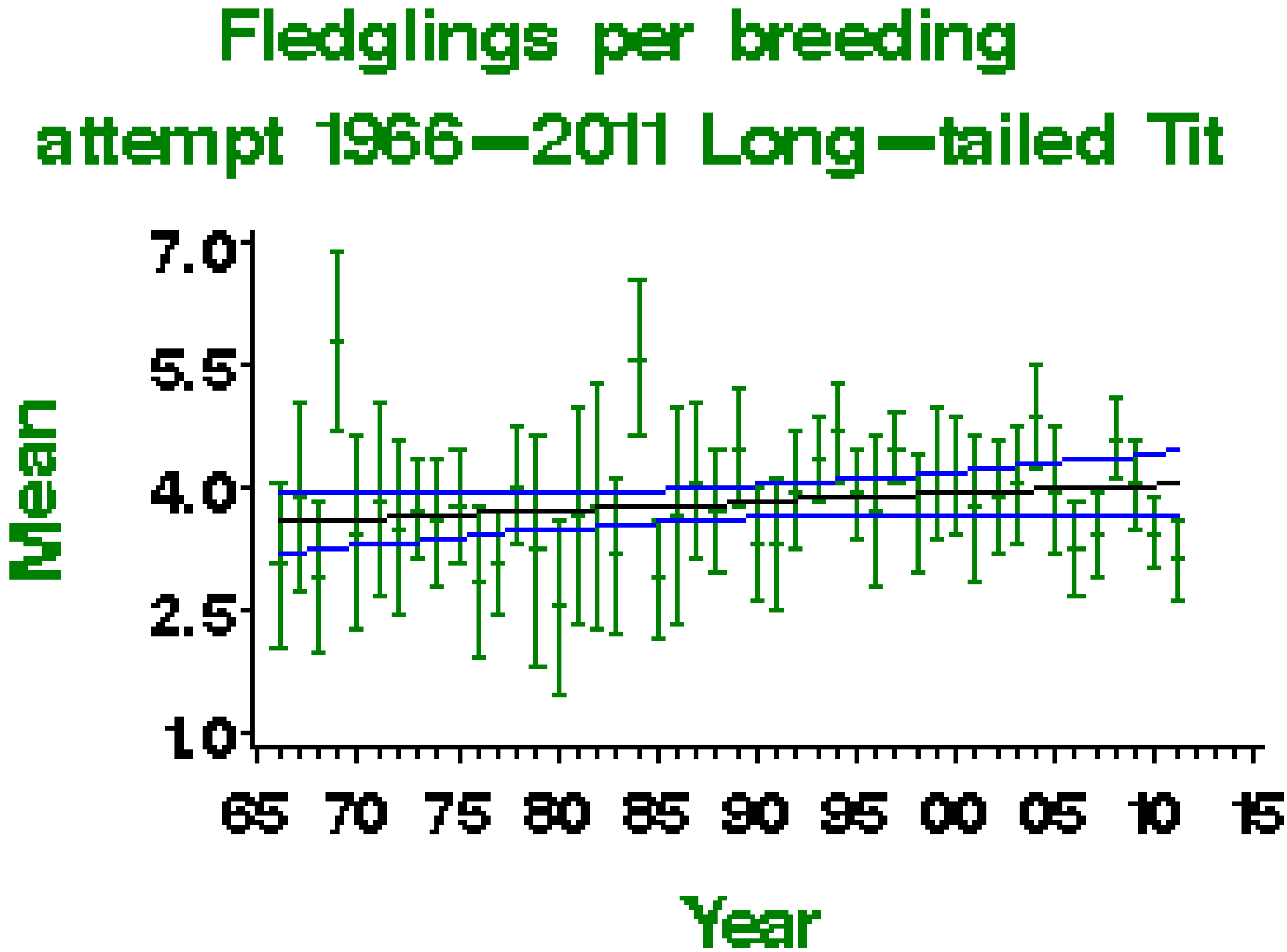


BBS England graph

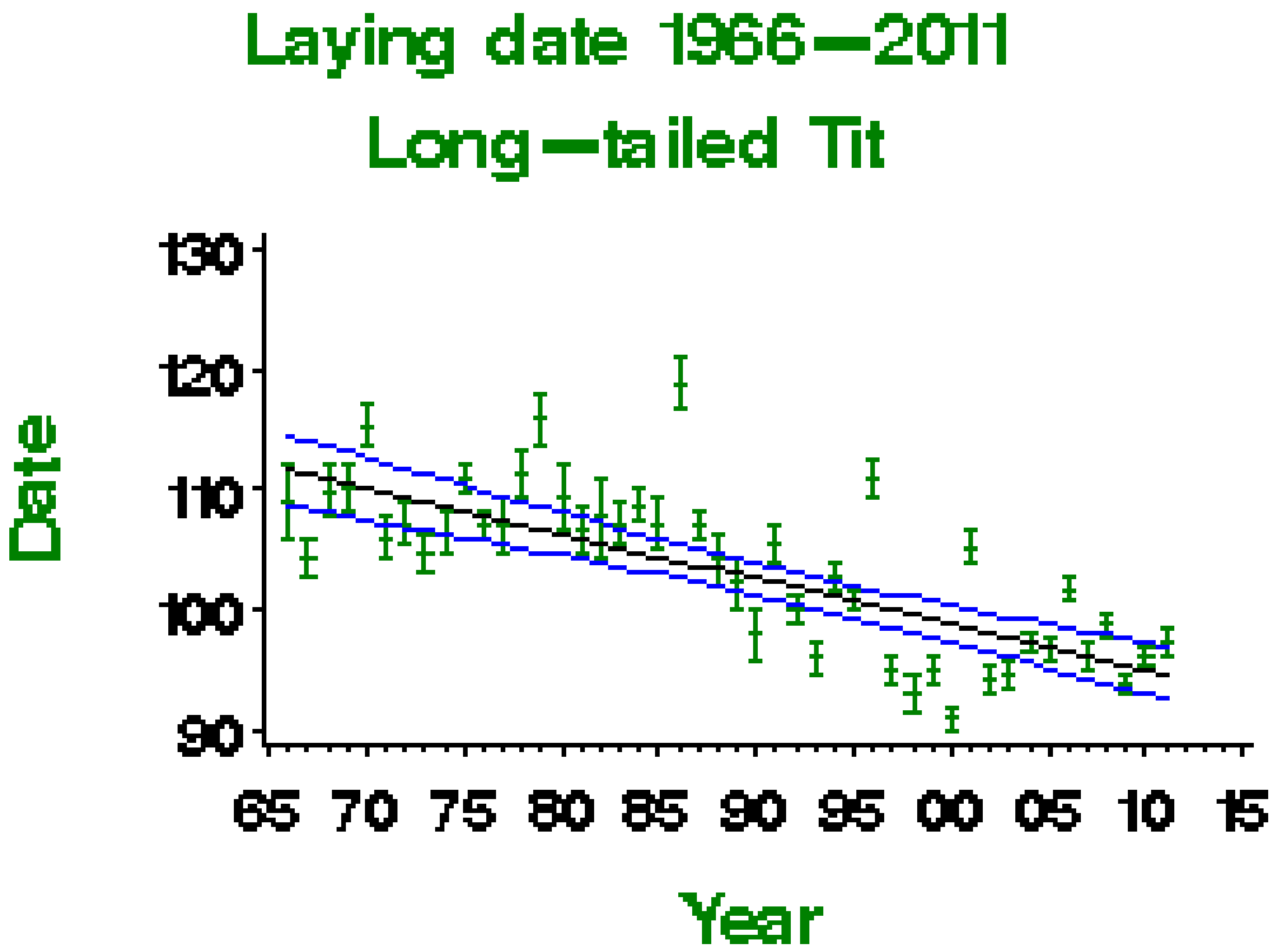


BBS Wales graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend



Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

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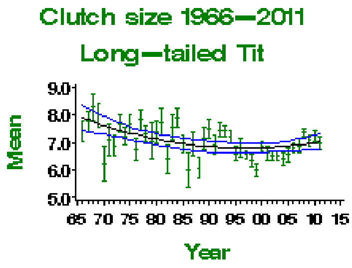
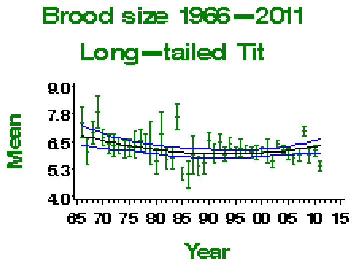
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	31	None					
Clutch size	42	1968-2010	40	Curvilinear	7.75 eggs	7.00 eggs	-9.7%		
Brood size	42	1968-2010	32	Curvilinear	6.65 chicks	6.26 chicks	-5.8%		
Nest failure rate at egg stage	42	1968-2010	57	Linear decline	3.29% nests/day	0.83% nests/day	-74.8%		
Nest failure rate at chick stage	42	1968-2010	39	Linear increase	0.76% nests/day	1.88% nests/day	147.4%		
Laying date	42	1968-2010	51	Linear decline	Apr 21	Apr 5	-16 days		
Juvenile to Adult ratio (CES)	26	1984-2010	87	Smoothed trend	96 Index value	100 Index value	5%		
Juvenile to Adult ratio (CES)	25	1985-2010	89	Smoothed trend	78 Index value	100 Index value	29%		
Juvenile to Adult ratio (CES)	10	2000-2010	101	Smoothed trend	101 Index value	100 Index value	-1%		
Juvenile to Adult ratio (CES)	5	2005-2010	99	Smoothed trend	82 Index value	100 Index value	22%		

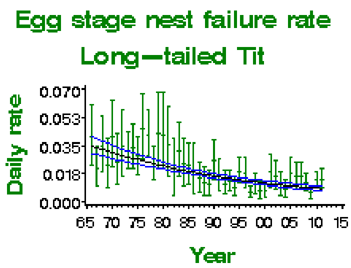
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



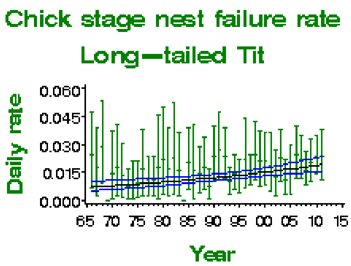
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



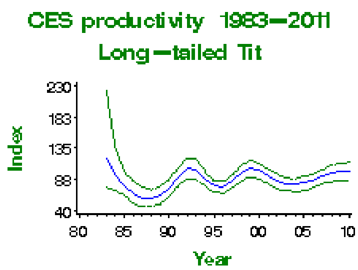
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



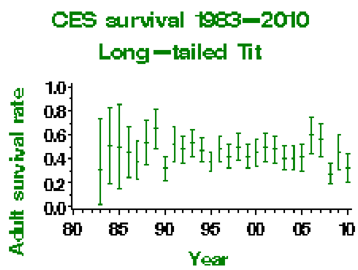
Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Smoothed long-term trend in ratio of juvenile:adult birds caught - green lines indicate 85% confidence limits



Proportion of adult birds surviving to following year - green bars represent 95% confidence limits

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Wood Warbler

Phylloscopus sibilatrix

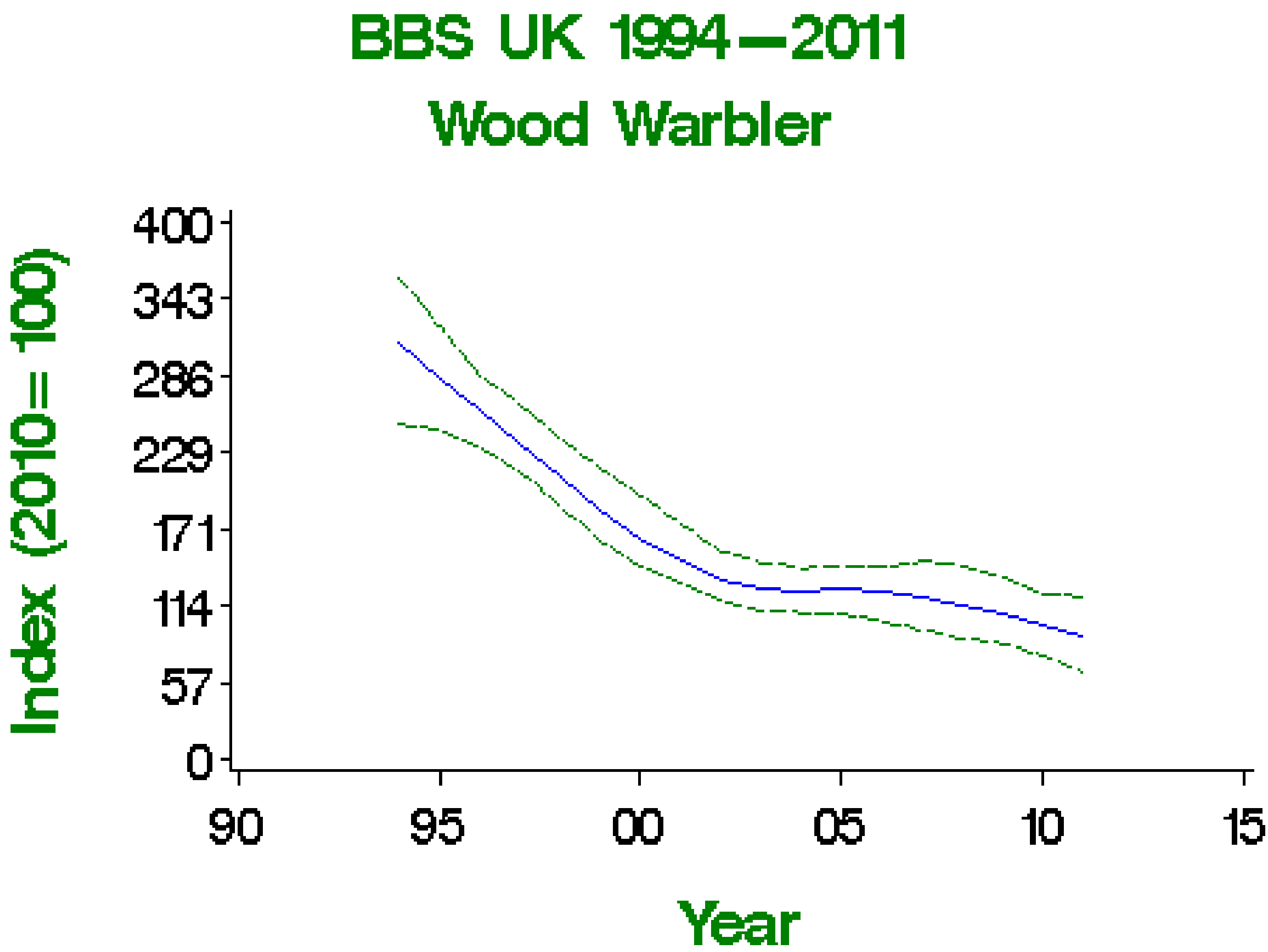
Key facts

Conservation listings:	Europe: SPEC category 2 (declining) (BiE04) UK: red (breeding decline, European status) (BoCC3) UK Biodiversity Action Plan: priority species
Long-term trend:	UK: decline
Population size:	6,500 (5,900-7,000) males in 2009 (APEP13: 1984-85 estimate (Bibby 1989) updated using CBC/BBS trend)

Migrant status:	Long-distance migrant
Nesting habitat:	Ground nester
Primary breeding habitat:	Woodland
Secondary breeding habitat:	
Breeding diet:	Animal
Winter diet:	Animal

Status summary

Wood Warblers, which have a westerly distribution in Britain, were monitored relatively poorly until BBS began. Little change was evident at the few CBC plots on which the species occurred (Marchant et al. 1990). The species' breeding range varied little between the two atlas periods (Gibbonset al. 1993), but has subsequently retreated heavily from lowland England. BBS shows a rapid and significant decline since 1994, and accordingly the species was moved from the green to the amber list in 2002; the continued decline has now warranted a further shift to the red list. With declines evident across northern and western Europe, this previously 'secure' species is now provisionally categorised as 'declining' (BirdLife International 2004). Numbers have shown widespread moderate decrease across Europe since 1980 (PECBMS 2012a).



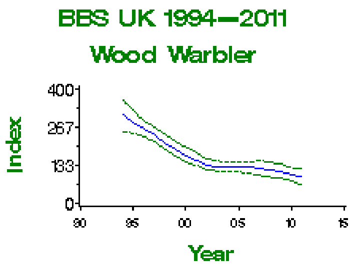
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	15	1995-2010	53	-65	-76	-49	>50	
	10	2000-2010	50	-39	-62	-13	>25	
	5	2005-2010	54	-21	-41	6		

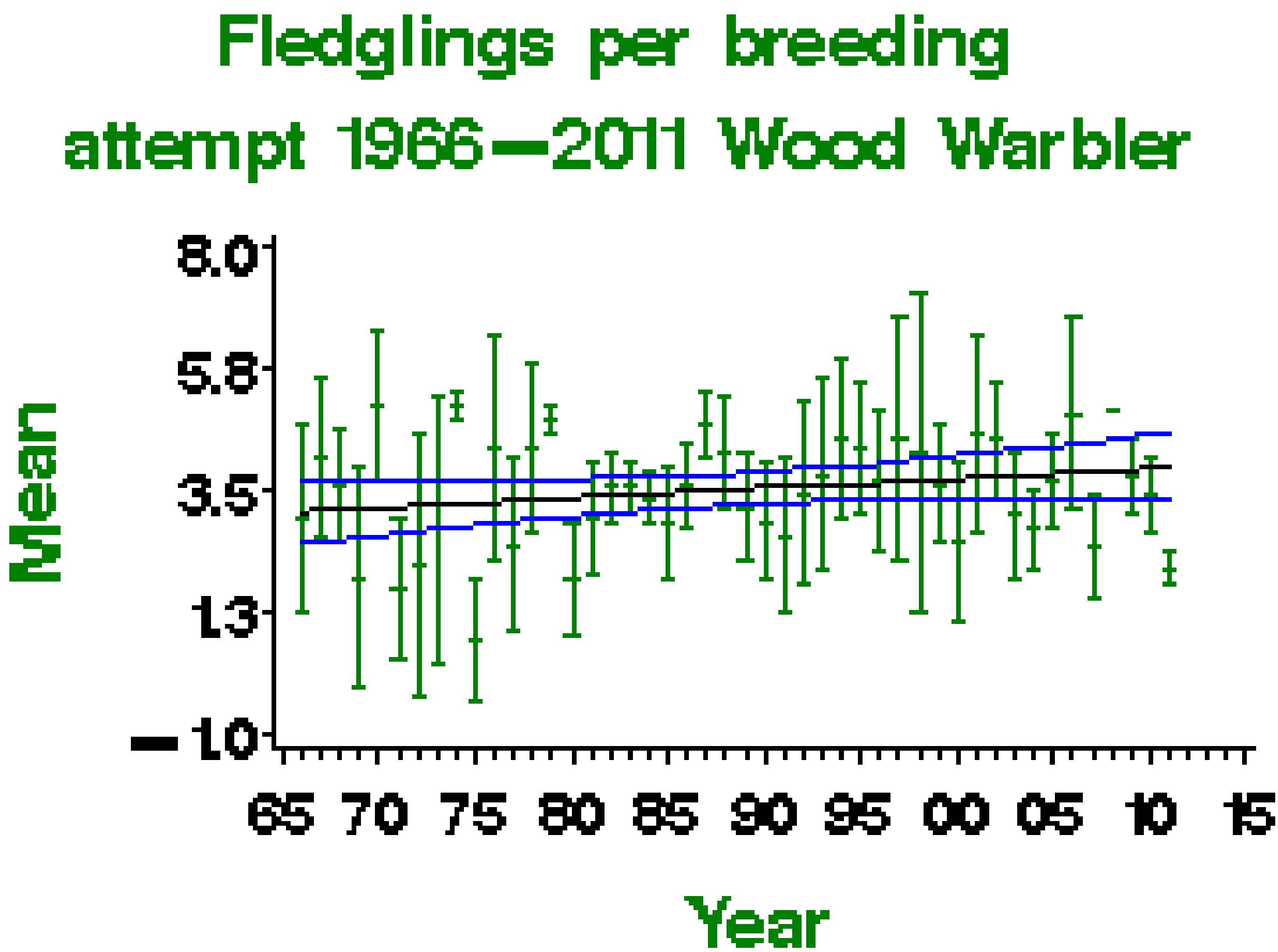
Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB

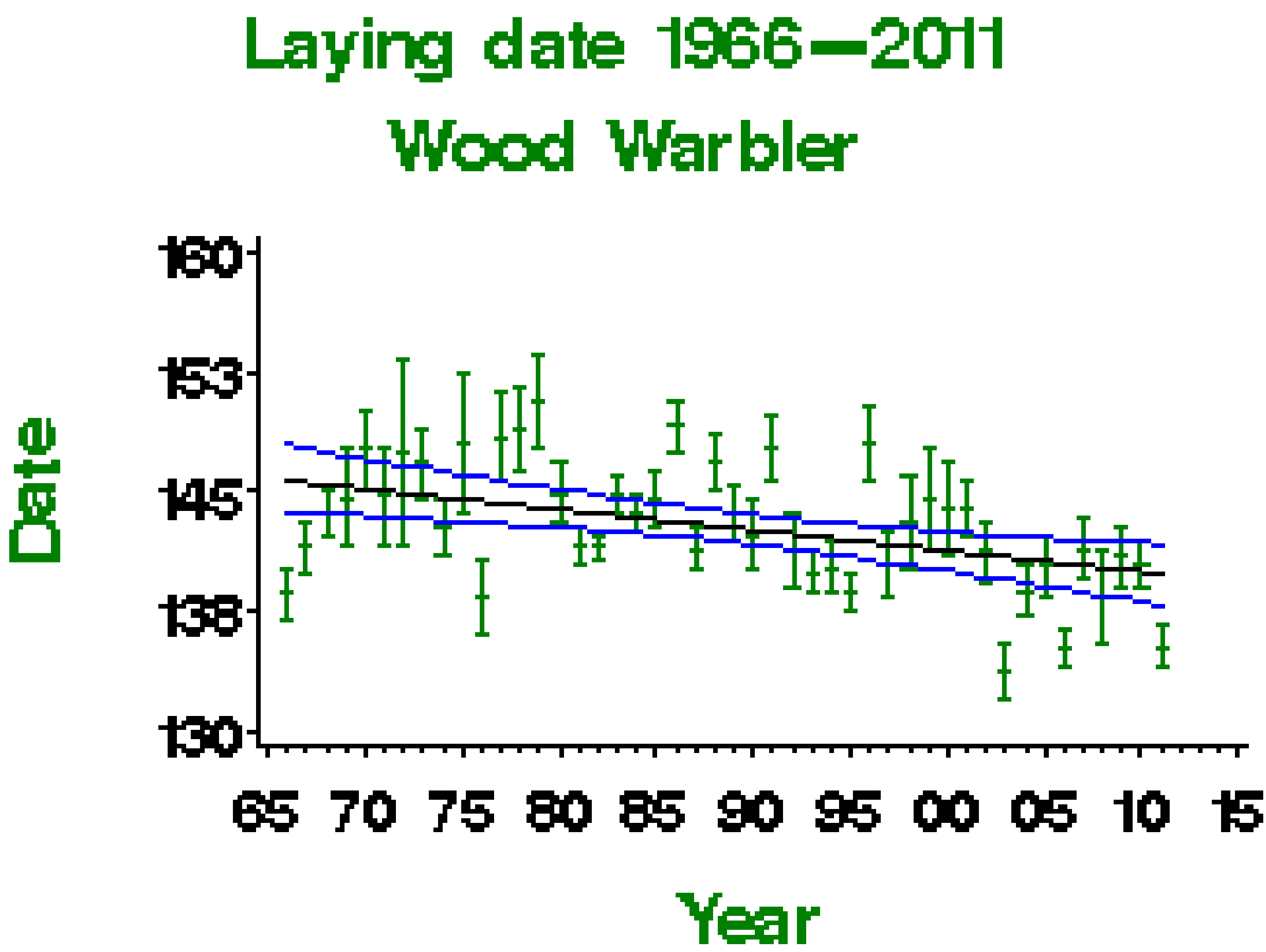


BBS UK graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

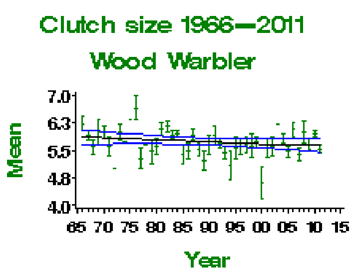


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

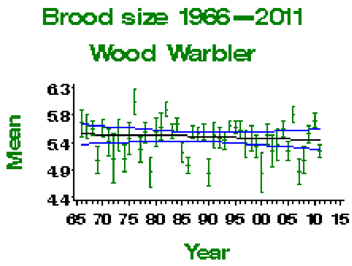
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	22	None					
Clutch size	42	1968-2010	18	None					Small sample
Brood size	42	1968-2010	38	None					
Nest failure rate at egg stage	42	1968-2010	23	Linear decline	1.98% nests/day	0.62% nests/day	-68.7%		Small sample
Nest failure rate at chick stage	42	1968-2010	30	None					Small sample
Laying date	42	1968-2010	34	Linear decline	May 26	May 20	-6 days		

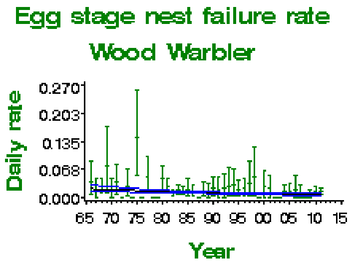
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



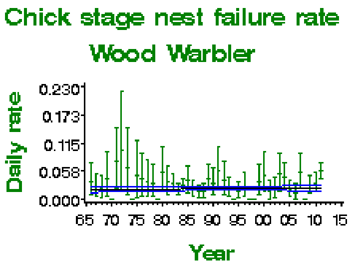
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

Causes of change

There is little evidence explaining either the demographic or ecological drivers of the decline in this species and the causes are largely unknown.

Change factor	Primary driver	Secondary driver
Demographic	Unknown	
Ecological	Unknown	

Further information on causes of change

There is little evidence regarding any demographic causes of the decline of this species. Nest success has apparently improved considerably at the egg stage (see above), although nest record samples are small. There has been no trend in the number of fledglings per breeding attempt.

Bibby (1989) stated that soils, climate, competition or predator numbers have probably had an effect on Wood Warbler numbers but provided no evidence to substantiate this. Smart et al. (2007) state that the loss of oak trees, the decrease in canopy cover, and the large increases in understorey cover could have been particularly detrimental for Wood Warbler, but again, direct evidence to validate this is largely lacking. Smart et al. (2007) and Amar et al. (2006) did find that Wood Warblers have tended to decrease more in woods with fewer dead limbs on trees and at sites surrounded by more woodland, which suggests that changes in dead wood could be important or that dead limbs could be a surrogate for other changes in habitat, although Smart et al. (2007) found an overall increase in the amount of dead wood, which should have been beneficial for this species. In another Welsh study, Mallord et al. (2012b) found that Wood Warblers were associated with a number of structural features of the study woods, which could relate to their past management; they suggest that management should aim to restore habitat quality through introducing a moderate grazing regime.

Studies in Poland have reported that varying predation rates were a main factor responsible for variation in production between years and habitats (Wesolowski 1985), where an average of over 70% of nests were lost and predators were responsible for over 80% of the losses. Wesolowski & Maziarz (2009) provided further evidence relating to this, finding that both Wood Warbler numbers and ratios of their change were significantly negatively correlated with rodent numbers. However, the authors state that, since Wood Warblers simply don't settle in areas with high rodent outbreaks, the changes probably reflect changes in distribution rather than overall trends. In Wales, nest predators during 2009-11 were mainly avian and rates of predation did not appear to have changed since 1982-84 (Mallord et al. 2012a). This species is a long-distance migrant and therefore changes outside the breeding grounds cannot be ruled out.

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Chiffchaff

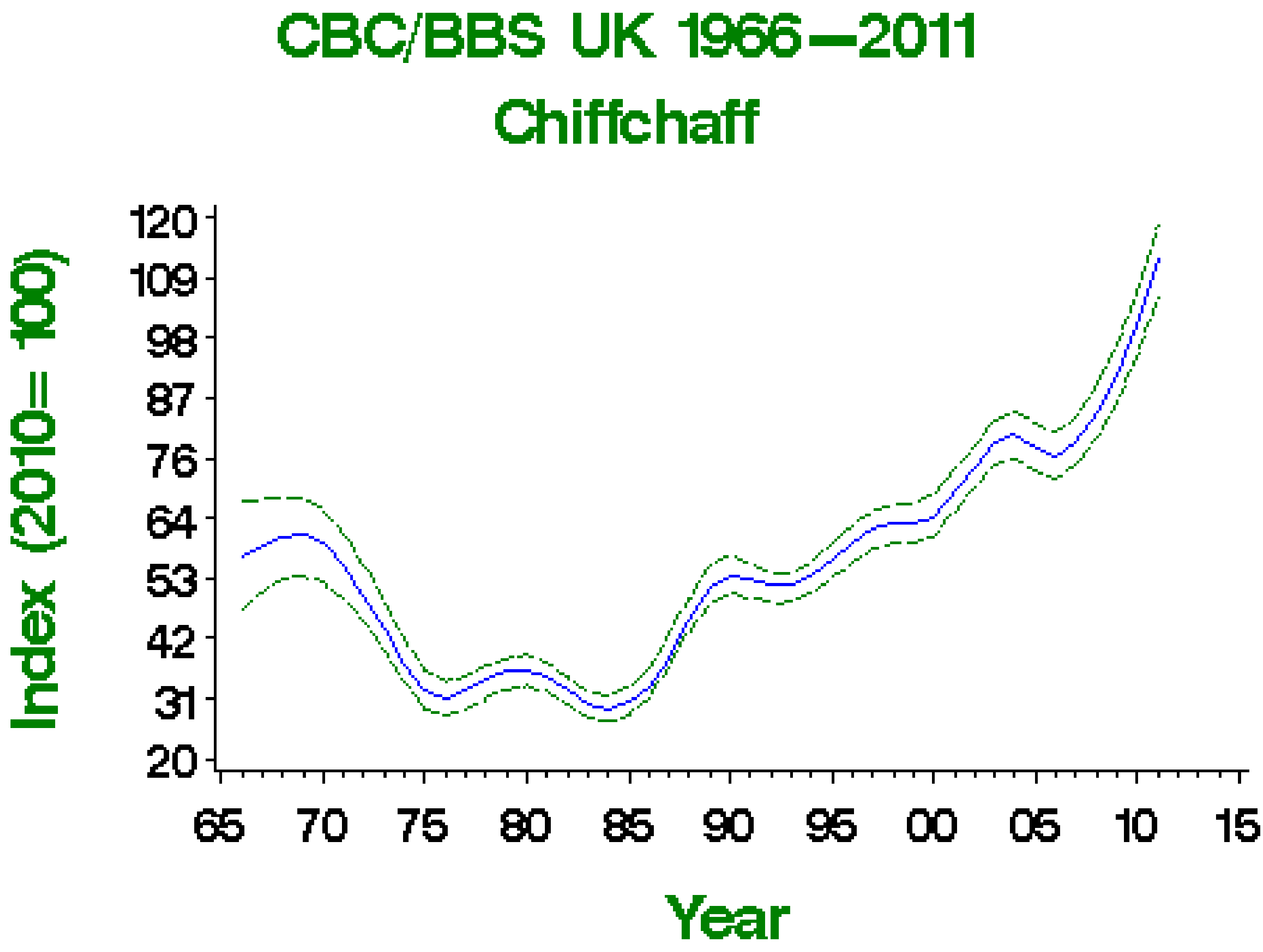
Phylloscopus collybita

Key facts

Conservation listings:	Europe: no SPEC category (not concentrated in Europe, conservation status favourable) (BiE04) UK: green (BoCC3)
Long-term trend:	UK, England: moderate increase
Population size:	1.2 million territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Status summary

Chiffchaff abundance crashed in the late 1960s/early 1970s in common with that of other trans-Saharan warblers (Siriwardena et al. 1998a). After remaining stable for a decade, the population recovered strongly, and has continued to increase. This recovery is evident from both CBC/BBS and CES data. The BBS PECBMS 2012a).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

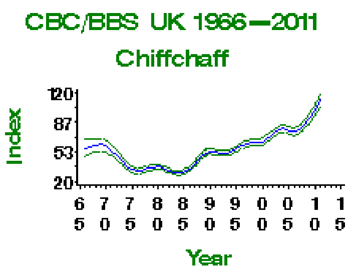
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	609	69	39	112		
	25	1985-2010	961	229	186	274		
	10	2000-2010	1645	54	48	60		
	5	2005-2010	1871	29	25	33		
CBC/BBS England	43	1967-2010	520	73	40	124		
	25	1985-2010	816	228	188	275		

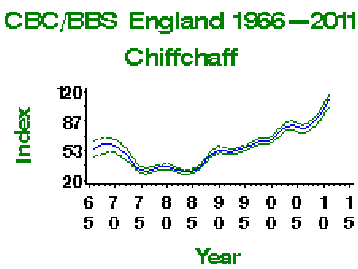
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	10	2000-2010	1386	52	45	57		
	5	2005-2010	1579	26	21	29		
CES adults	26	1984-2010	72	211	108	376		
	25	1985-2010	74	221	118	410		
	10	2000-2010	89	57	38	86		
	5	2005-2010	89	12	5	23		
CES juveniles	26	1984-2010	83	196	104	371		
	25	1985-2010	85	180	98	344		
	10	2000-2010	96	67	44	101		
	5	2005-2010	95	32	18	49		
BBS UK	15	1995-2010	1407	70	63	81		
	10	2000-2010	1632	52	46	59		
	5	2005-2010	1871	29	24	32		
BBS England	15	1995-2010	1181	69	62	80		
	10	2000-2010	1365	48	42	53		
	5	2005-2010	1562	25	21	28		
BBS Scotland	15	1995-2010	44	336	189	633		
	10	2000-2010	55	104	44	226		
	5	2005-2010	71	47	20	91		
BBS Wales	15	1995-2010	134	50	29	76		
	10	2000-2010	154	63	44	80		
	5	2005-2010	166	34	20	50		
BBS N.Ireland	15	1995-2010	31	36	-3	68		
	10	2000-2010	36	52	14	97		
	5	2005-2010	42	80	48	114		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

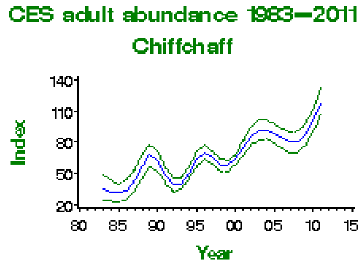
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



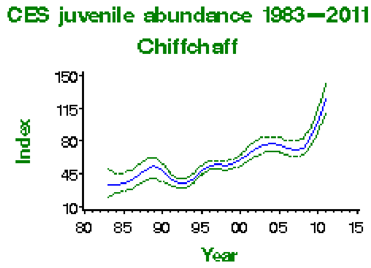
CBC/BBS UK graph



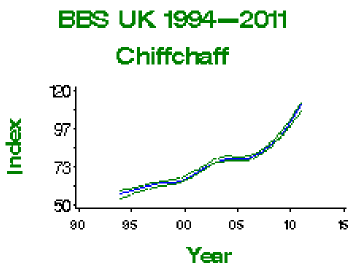
CBC/BBS England graph



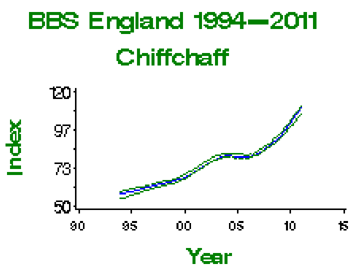
CES adults graph



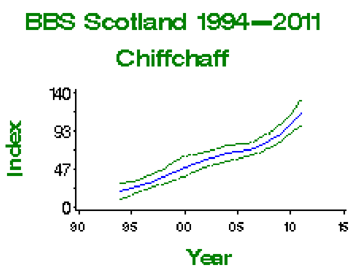
CES juveniles graph



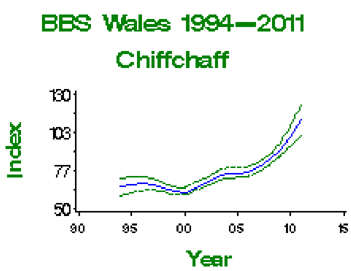
BBS UK graph



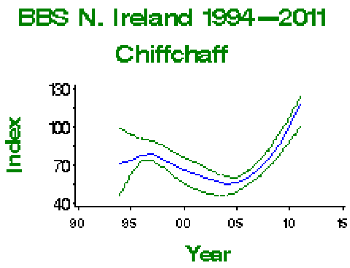
BBS England graph



BBS Scotland graph

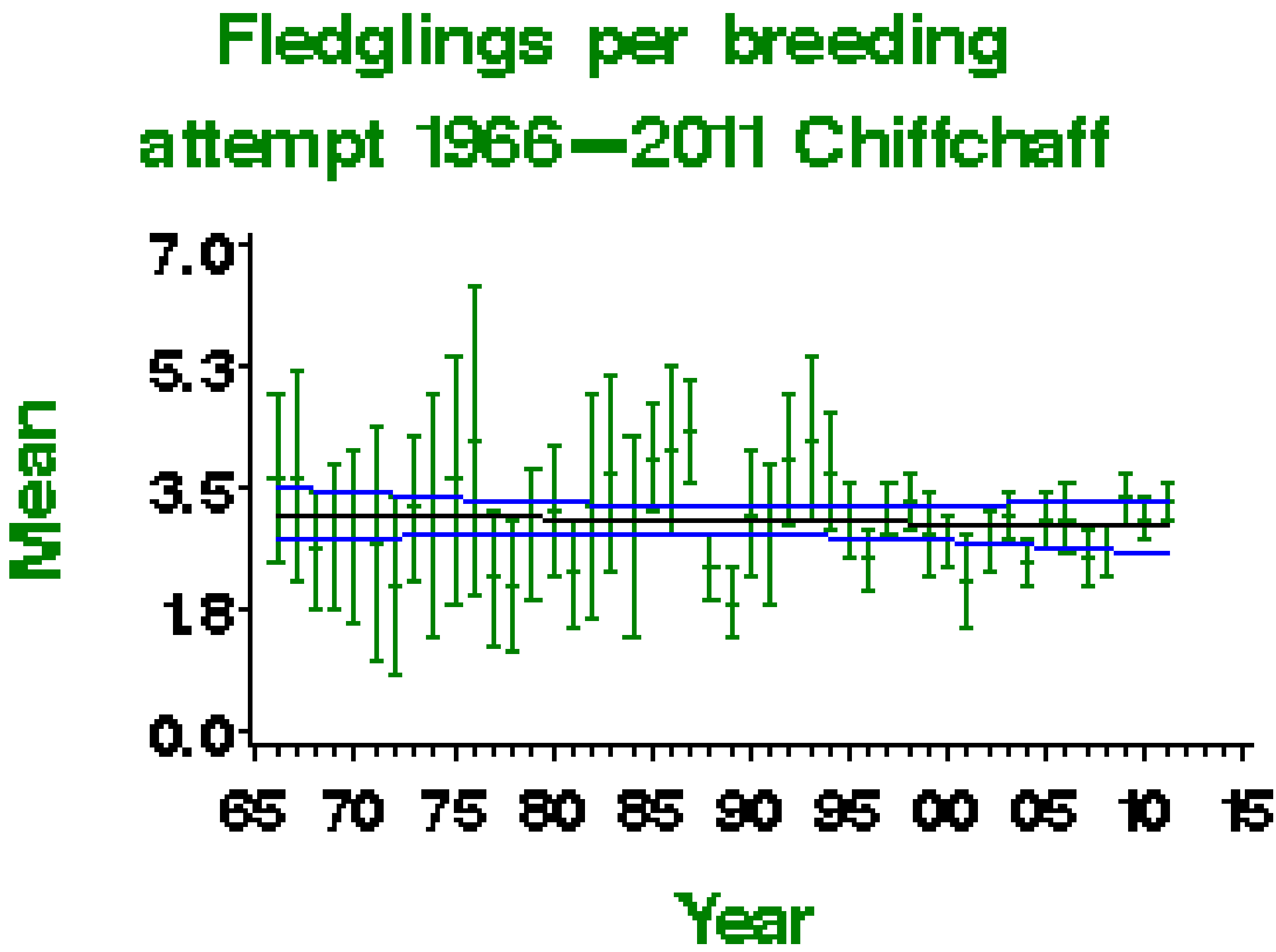


BBS Wales graph

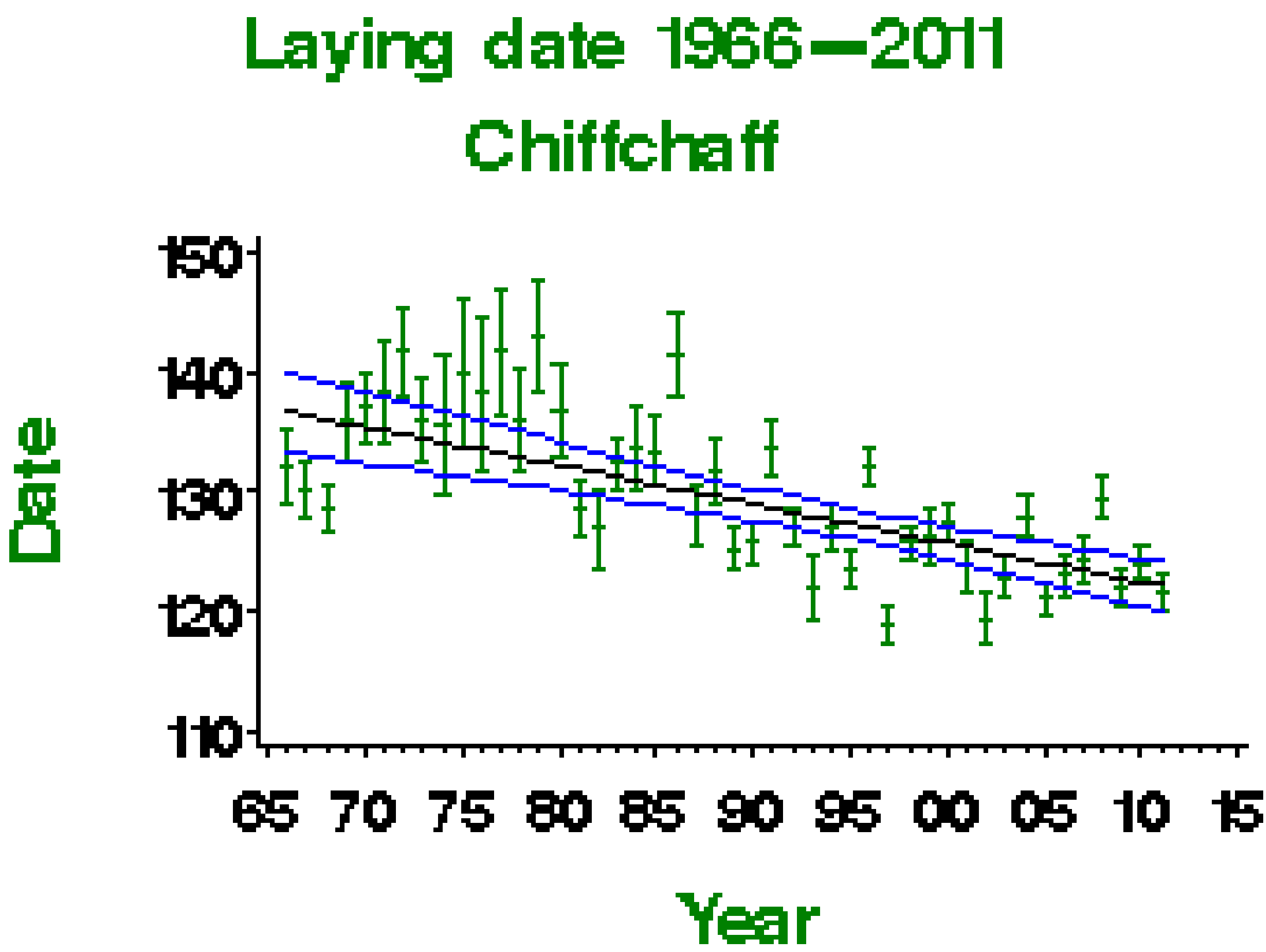


BBS N.Ireland graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend



Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

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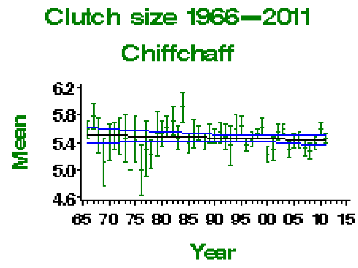
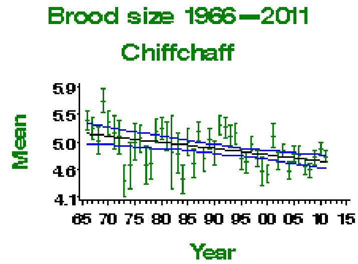
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	38	None					
Clutch size	42	1968-2010	37	None					
Brood size	42	1968-2010	42	Linear decline	5.11 chicks	4.69 chicks	-8.4%		
Nest failure rate at egg stage	42	1968-2010	47	None					
Nest failure rate at chick stage	42	1968-2010	41	None					
Laying date	42	1968-2010	55	Linear decline	May 16	May 3	-13 days		
Juvenile to Adult ratio (CES)	26	1984-2010	90	Smoothed trend	96 Index value	100 Index value	4%		
Juvenile to Adult ratio (CES)	25	1985-2010	92	Smoothed trend	117 Index value	100 Index value	-14%		
Juvenile to Adult ratio (CES)	10	2000-2010	103	Smoothed trend	112 Index value	100 Index value	-11%		
Juvenile to Adult ratio (CES)	5	2005-2010	101	Smoothed trend	79 Index value	100 Index value	27%		

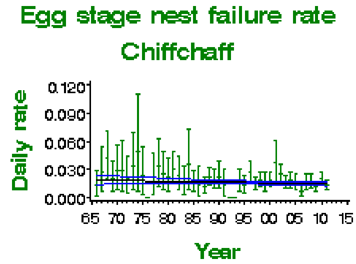
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



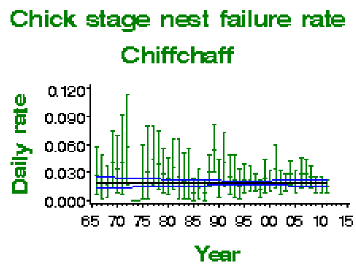
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



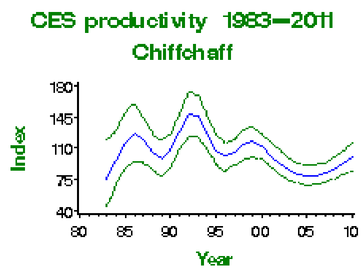
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



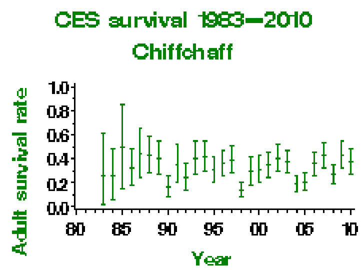
Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Smoothed long-term trend in ratio of juvenile:adult birds caught - green lines indicate 85% confidence limits



Proportion of adult birds surviving to following year - green bars represent 95% confidence limits

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Willow Warbler

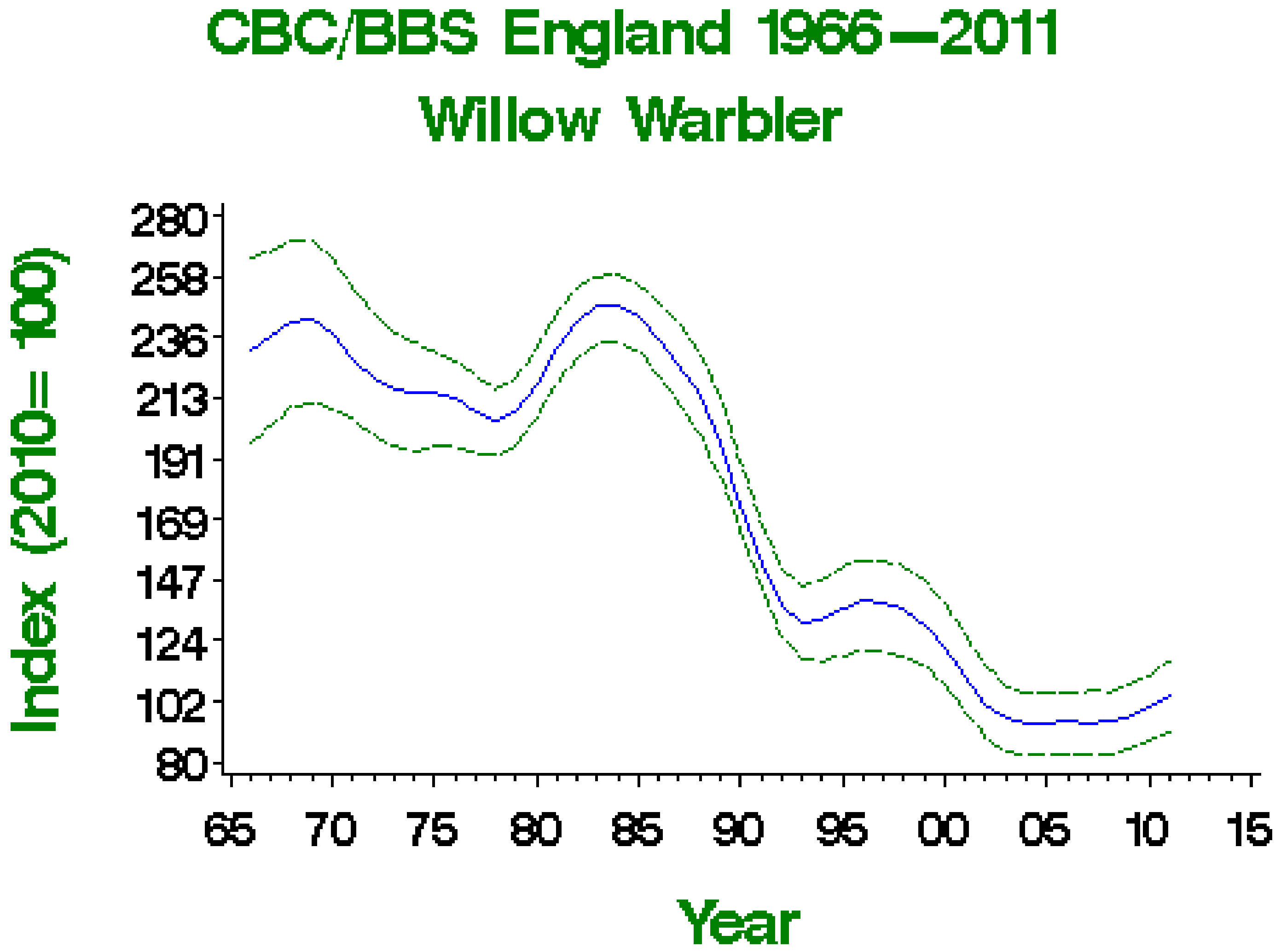
Phylloscopus trochilus

Key facts

Conservation listings:	Europe: no SPEC category (not concentrated in Europe, conservation status favourable) (BiE04) UK: amber (species level, 25-50% population decline; race trochilus, 25-50% population decline, European status) (BoCC3)
Long-term trend:	England: rapid decline
Population size:	2.4 million territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Status summary

Willow Warbler abundance has shown regionally different trends within the UK (Morrison et al. 2010). The overall CBC/BBS trend shows a rapid decline during the 1980s and early 1990s, after 20 years of relative stability, and, on the strength of a 31% decline on CBC plots between 1974 and 1999, the species was moved from the green to the amber list. This decline occurred mainly in southern Britain, however, accompanied by a fall in survival rates there (Peach et al. 1995a), with Scottish populations remaining unaffected. BBS figures since 1994 indicate a stark contrast between an initially upward trend in Scotland and in Northern Ireland, and continued severe decreases in England and in Wales. The BBS Fuller et al. 2005). The recent population decline is associated with a shallow decline in productivity as measured by CES and with a substantial increase in failure rates at the egg stage, which raises NRS concern (Leech & Barimore 2008). There is a small but significant decrease in the number of fledglings per breeding attempt. Average laying dates have become a week earlier, perhaps in response to recent climatic warming (Crick & Sparks 1999). Numbers have shown widespread moderate decrease across Europe since 1980 (PECBMS 2012a).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

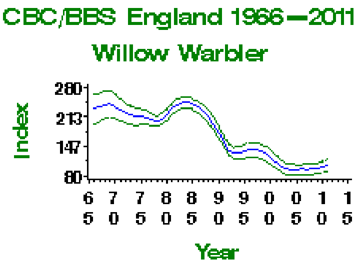
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	43	1967-2010	465	-58	-68	-42	>50	
	25	1985-2010	680	-59	-65	-52	>50	

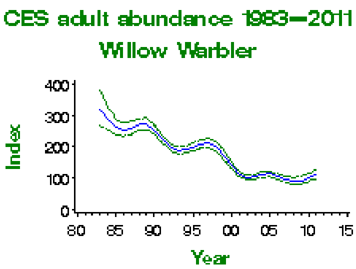
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	10	2000-2010	954	-18	-24	-12		
	5	2005-2010	1055	6	1	12		
CES adults	26	1984-2010	89	-65	-73	-56	>50	
	25	1985-2010	91	-62	-70	-53	>50	
	10	2000-2010	88	-28	-37	-17	>25	
	5	2005-2010	85	-12	-21	-2		
CES juveniles	26	1984-2010	92	-36	-56	6		
	25	1985-2010	95	-34	-54	1		
	10	2000-2010	97	4	-14	28		
	5	2005-2010	94	18	-1	43		
BBS UK	15	1995-2010	1382	3	-2	10		
	10	2000-2010	1432	4	-1	9		
	5	2005-2010	1591	22	17	28		
BBS England	15	1995-2010	907	-28	-33	-22	>25	
	10	2000-2010	909	-14	-20	-10		
	5	2005-2010	996	7	3	12		
BBS Scotland	15	1995-2010	211	33	17	47		
	10	2000-2010	222	10	-1	22		
	5	2005-2010	258	22	14	34		
BBS Wales	15	1995-2010	159	-2	-17	16		
	10	2000-2010	172	11	-3	22		
	5	2005-2010	178	34	24	48		
BBS N.Ireland	15	1995-2010	78	109	60	136		
	10	2000-2010	91	36	21	55		
	5	2005-2010	97	58	44	76		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

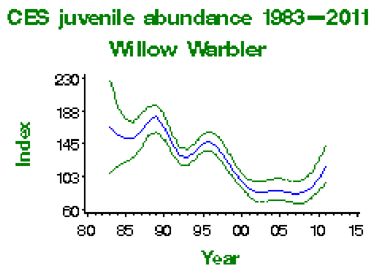
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



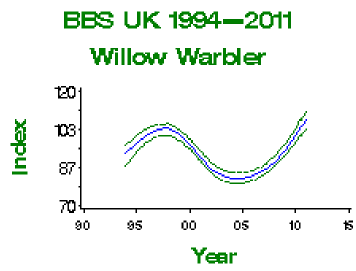
CBC/BBS England graph



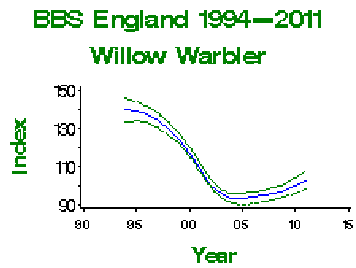
CES adults graph



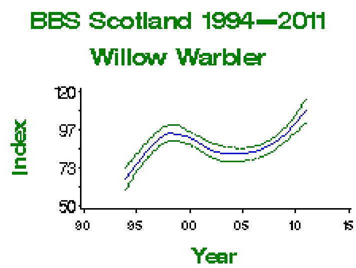
CES juveniles graph



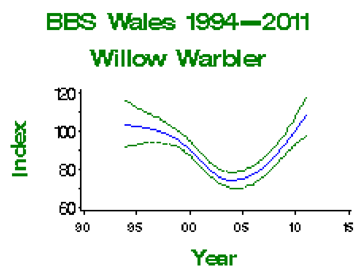
BBS UK graph



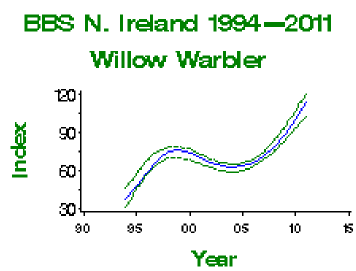
BBS England graph



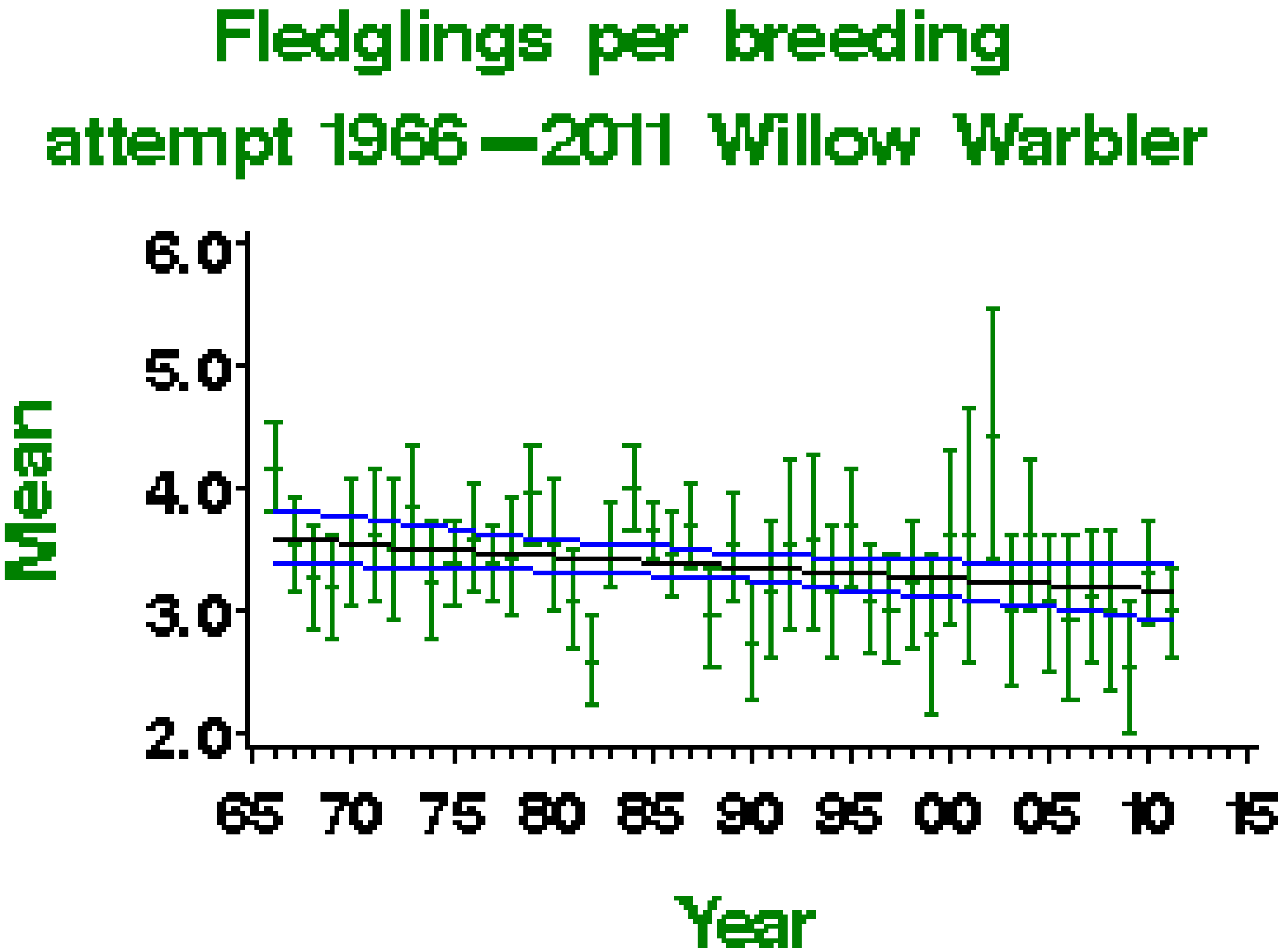
BBS Scotland graph



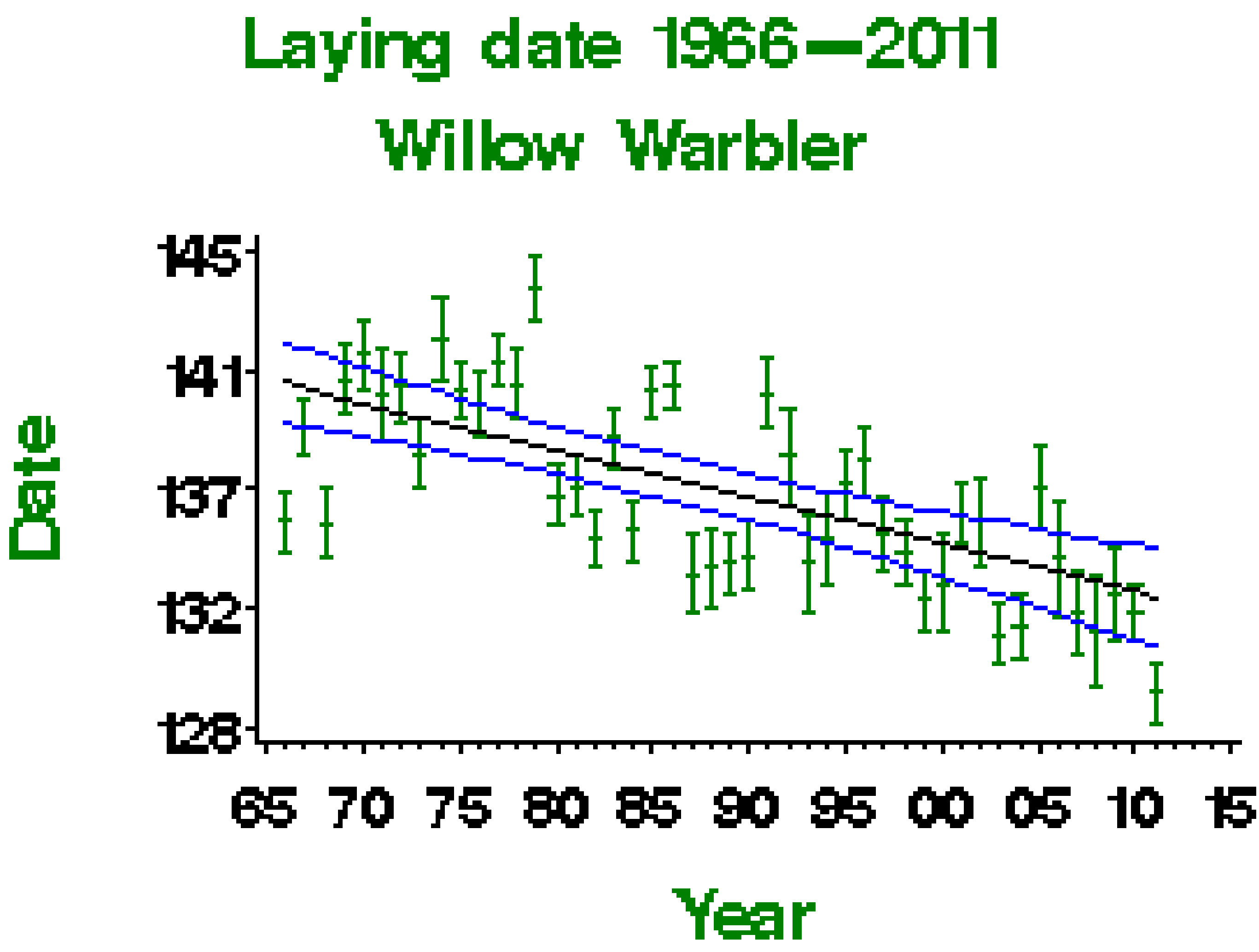
BBS Wales graph



BBS N.Ireland graph



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

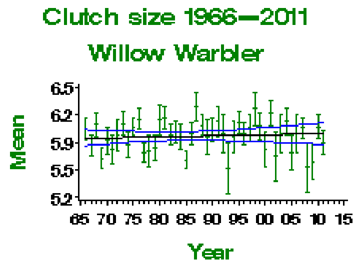


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

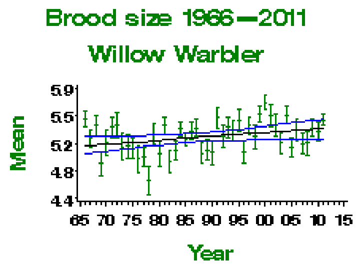
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	67	Linear decline	3.59 fledglings	3.17 fledglings	-11.7%		
Clutch size	42	1968-2010	48	None					
Brood size	42	1968-2010	137	Linear increase	5.13 chicks	5.34 chicks	4.0%		
Nest failure rate at egg stage	42	1968-2010	67	Linear increase	0.95% nests/day	1.65% nests/day	73.7%		
Nest failure rate at chick stage	42	1968-2010	123	Linear increase	1.53% nests/day	2.02% nests/day	32.0%		
Laying date	42	1968-2010	84	Linear decline	May 20	May 13	-7 days		
Juvenile to Adult ratio (CES)	26	1984-2010	98	Smoothed trend	110 Index value	100 Index value	-9%		
Juvenile to Adult ratio (CES)	25	1985-2010	101	Smoothed trend	105 Index value	100 Index value	-5%		
Juvenile to Adult ratio (CES)	10	2000-2010	103	Smoothed trend	81 Index value	100 Index value	23%		
Juvenile to Adult ratio (CES)	5	2005-2010	99	Smoothed trend	74 Index value	100 Index value	35%		

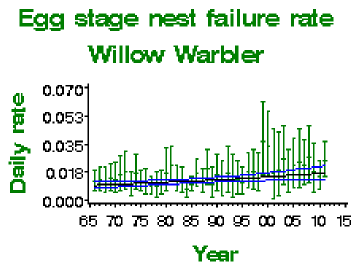
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



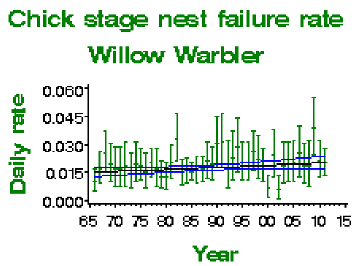
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



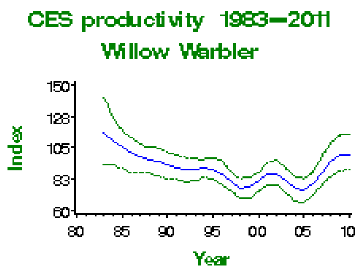
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



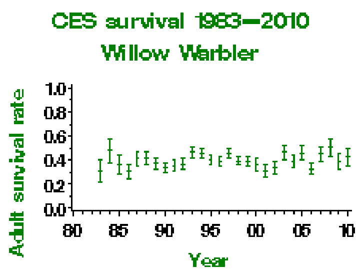
Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Smoothed long-term trend in ratio of juvenile:adult birds caught - green lines indicate 85% confidence limits



Proportion of adult birds surviving to following year - green bars represent 95% confidence limits

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Blackcap

Sylvia atricapilla

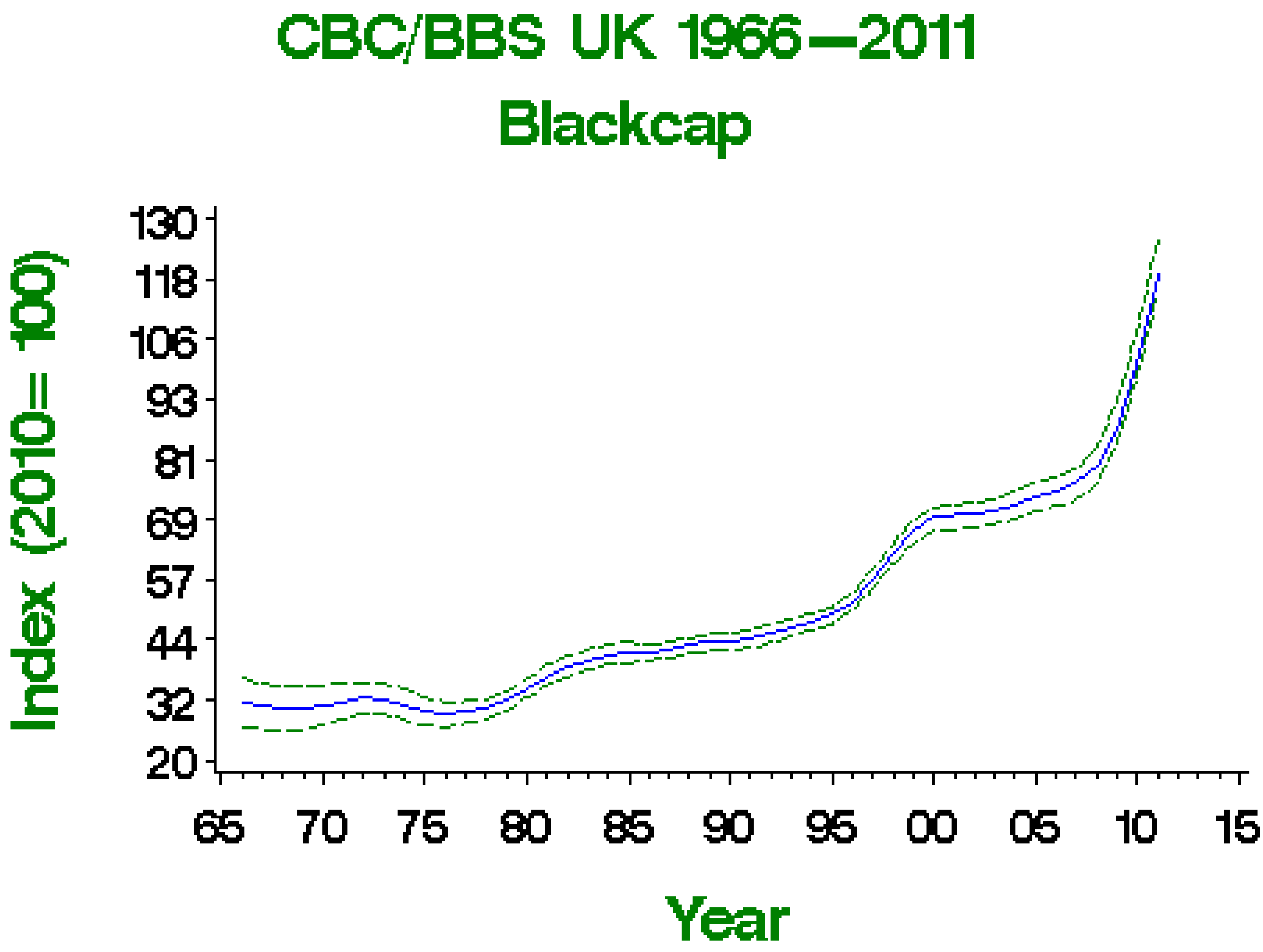
Key facts

Conservation listings:	Europe: no SPEC category (concentrated in Europe, conservation status favourable) (BiE04) UK: green (BoCC3)
Long-term trend:	UK, England: rapid increase
Population size:	1.2 million territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Migrant status:	Short-distance migrant
Nesting habitat:	Above-ground nester
Primary breeding habitat:	Woodland
Secondary breeding habitat:	
Breeding diet:	Animal
Winter diet:	Animal

Status summary

Blackcap abundance in the UK has increased consistently since the late 1970s, a trend common to all habitats and evident from both the CBC/BBS and the CES indices. Overall increase has occurred despite a reduction in habitat quality for Blackcap, and other understory-dependent species, brought about by deer browsing in young woodland (Holt et al. 2012d). The BBS PECBMS 2012a).



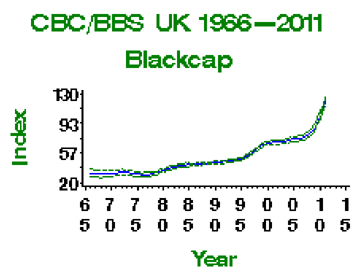
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

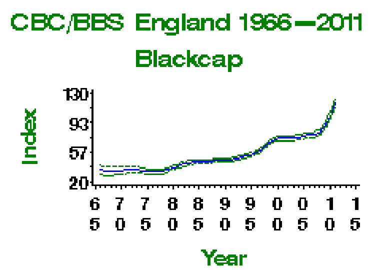
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	661	224	175	312		
	25	1985-2010	1035	139	128	168		
	10	2000-2010	1736	44	40	53		
	5	2005-2010	1974	36	35	43		
CBC/BBS England	43	1967-2010	575	197	142	292		
	25	1985-2010	895	124	111	148		
	10	2000-2010	1483	36	34	42		
	5	2005-2010	1686	30	29	36		
CES adults	26	1984-2010	90	78	49	112		
	25	1985-2010	92	89	61	121		
	10	2000-2010	101	29	18	42		
	5	2005-2010	98	4	-3	11		
CES juveniles	26	1984-2010	92	39	0	89		
	25	1985-2010	94	49	12	106		
	10	2000-2010	103	35	10	58		
	5	2005-2010	99	13	-2	26		
BBS UK	15	1995-2010	1498	102	94	117		
	10	2000-2010	1722	47	45	57		
	5	2005-2010	1974	37	36	45		
BBS England	15	1995-2010	1282	84	80	98		
	10	2000-2010	1461	39	37	46		
	5	2005-2010	1669	31	30	38		
BBS Scotland	15	1995-2010	54	264	160	422		
	10	2000-2010	67	85	47	141		
	5	2005-2010	85	54	33	90		
BBS Wales	15	1995-2010	118	114	85	161		
	10	2000-2010	135	57	43	85		
	5	2005-2010	144	45	38	67		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

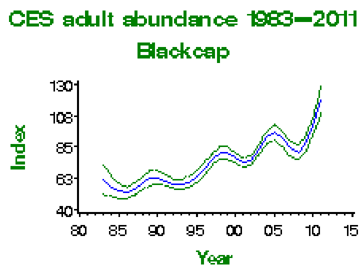
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



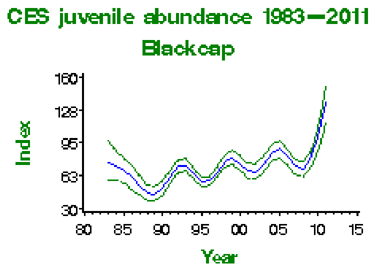
CBC/BBS UK graph



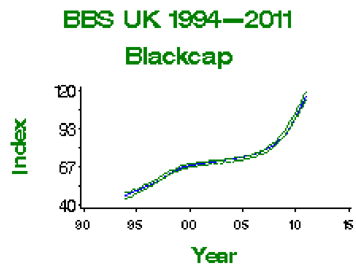
CBC/BBS England graph



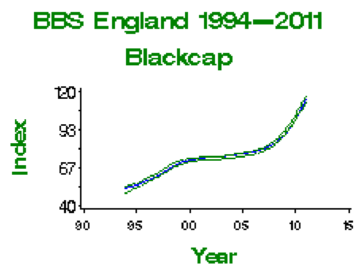
CES adults graph



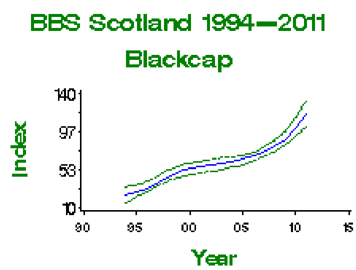
CES juveniles graph



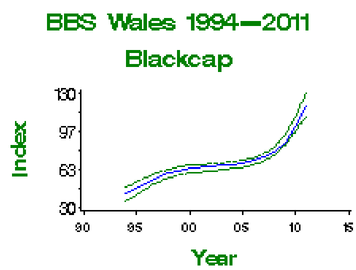
BBS UK graph



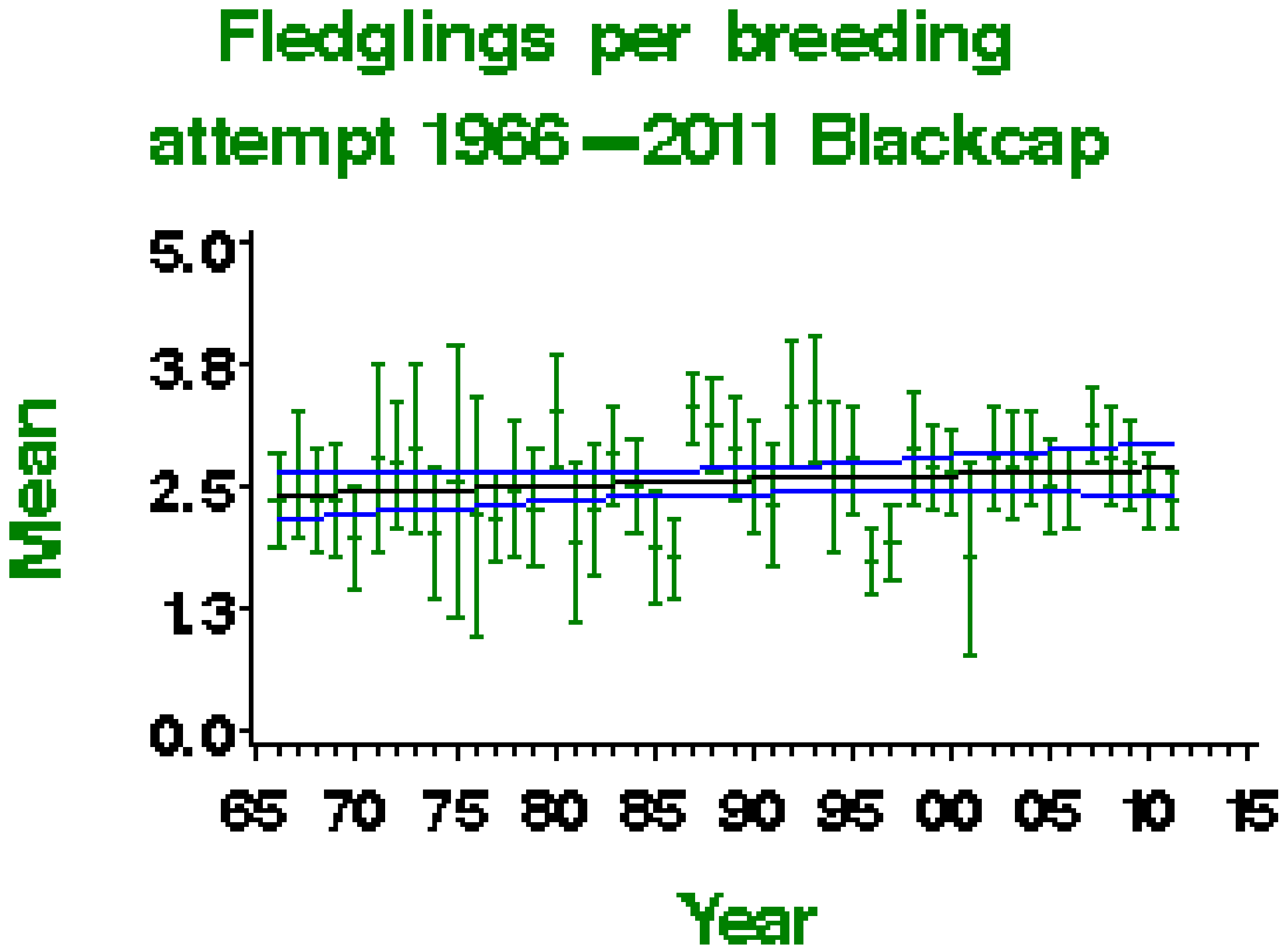
BBS England graph



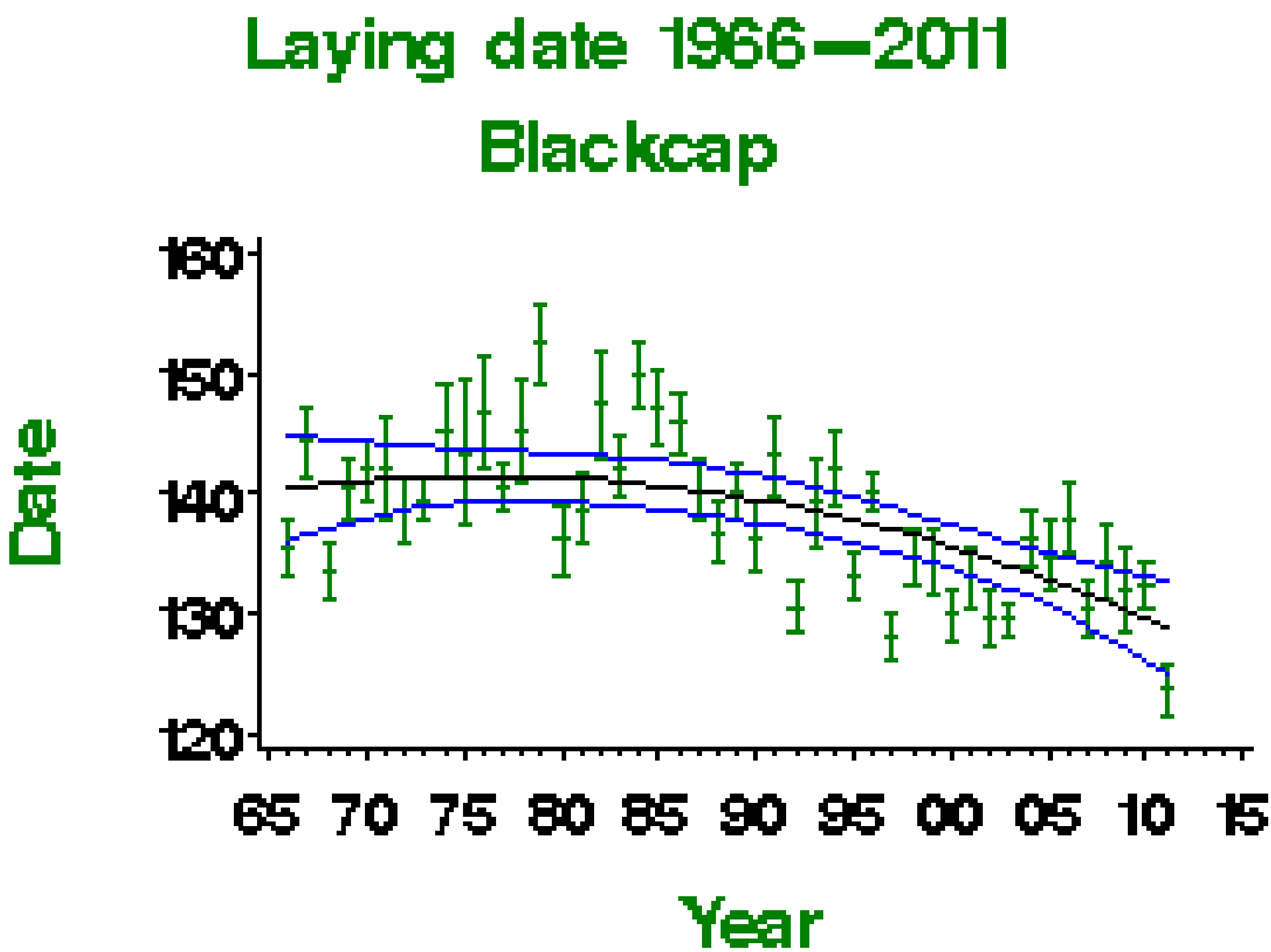
BBS Scotland graph



BBS Wales graph



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend



Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

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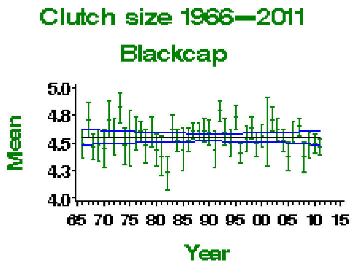
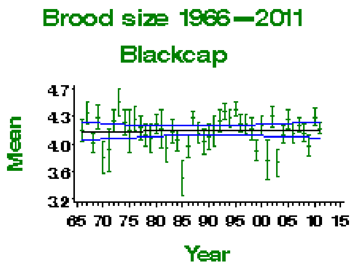
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	38	None					
Clutch size	42	1968-2010	39	None					
Brood size	42	1968-2010	46	None					
Nest failure rate at egg stage	42	1968-2010	49	Linear decline	2.18% nests/day	1.46% nests/day	-33.0%		
Nest failure rate at chick stage	42	1968-2010	38	None					
Laying date	42	1968-2010	40	Curvilinear	May 21	May 10	-11 days		
Juvenile to Adult ratio (CES)	26	1984-2010	98	Smoothed trend	118 Index value	100 Index value	-15%		
Juvenile to Adult ratio (CES)	25	1985-2010	100	Smoothed trend	137 Index value	100 Index value	-27%	>25	
Juvenile to Adult ratio (CES)	10	2000-2010	108	Smoothed trend	88 Index value	100 Index value	13%		
Juvenile to Adult ratio (CES)	5	2005-2010	104	Smoothed trend	102 Index value	100 Index value	-2%		

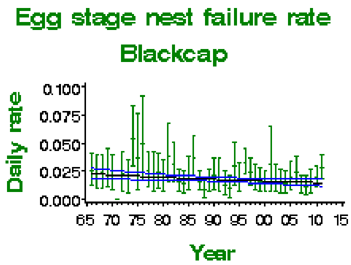
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



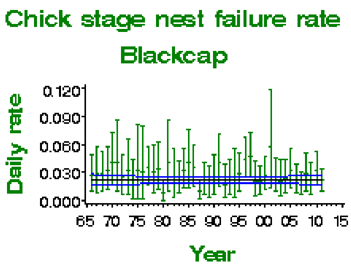
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



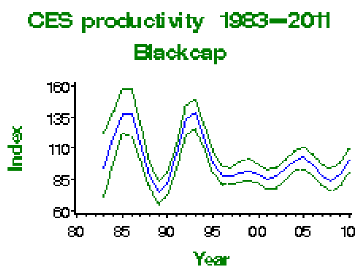
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



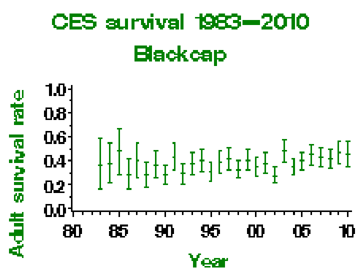
Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Smoothed long-term trend in ratio of juvenile:adult birds caught - green lines indicate 85% confidence limits



Proportion of adult birds surviving to following year - green bars represent 95% confidence limits

Causes of change

The causes of the increase in this species remain unknown.

Change factor	Primary driver	Secondary driver
Demographic	Unknown	
Ecological	Unknown	

Further information on causes of change

There has been a decrease in daily failure rate of nests at the egg stage while productivity has fluctuated markedly according to CES, obscuring any long-term trend. Survival rates have been stable. Using data from France, Julliard (2004) found that population growth rate was under the additive influence of survival and recruitment.

The trend towards earlier laying, amounting to an advance of ten days since 1968, may be a response to recent climate change (Crick & Sparks 1999, Croxton et al. 2006). The more rapid increase in Scotland indicated by BBS suggests that climatic warming may be allowing this species to extend its range northwards (Hewson et al. 2007).

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Garden Warbler

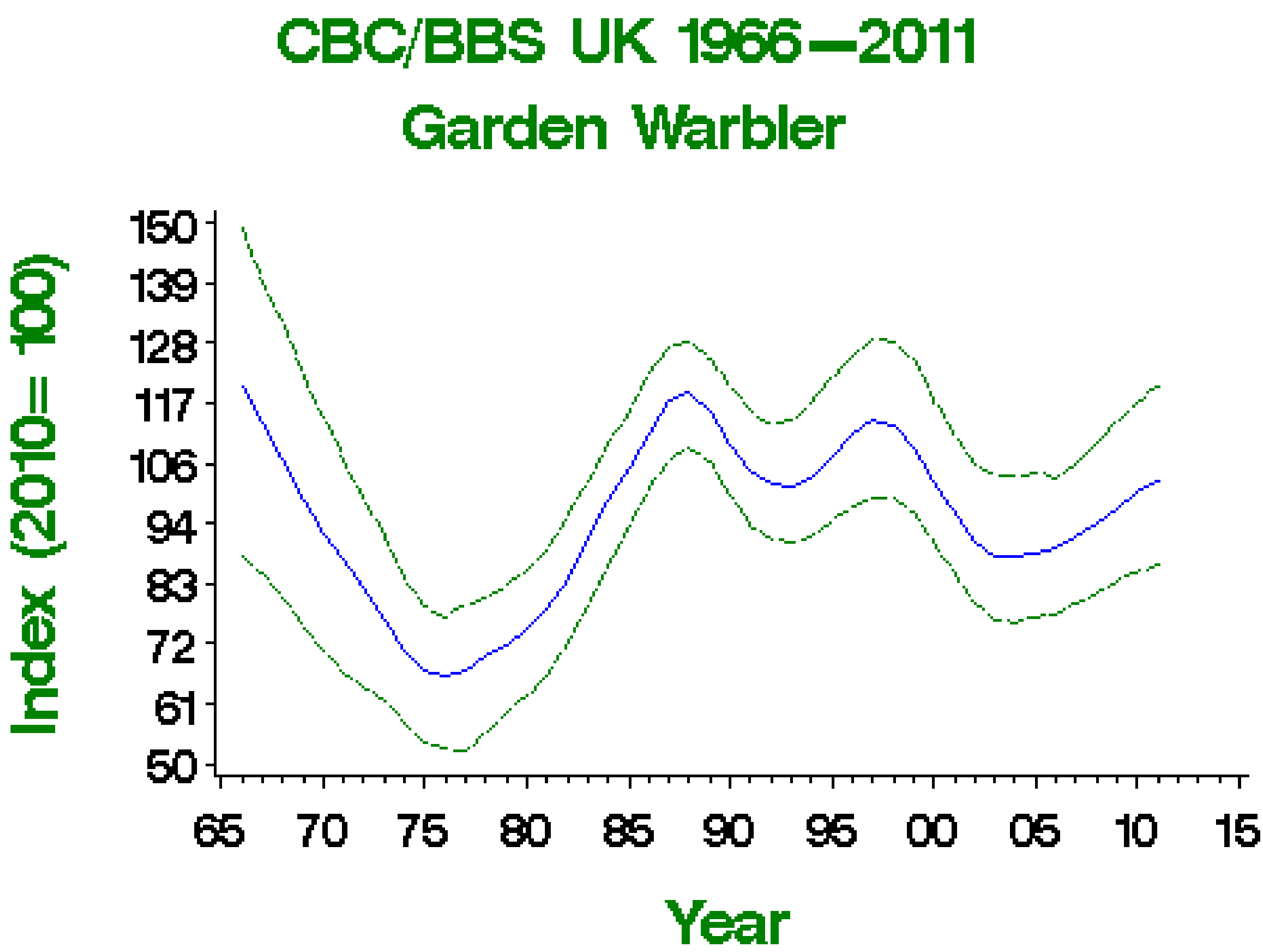
Sylvia borin

Key facts

Conservation listings:	Europe: no SPEC category (concentrated in Europe, conservation status favourable) (BiE04) UK: green (BoCC3)
Long-term trend:	UK, England: shallow decline
Population size:	170,000 territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Status summary

Garden Warbler abundance has varied alongside that of other trans-Saharan migrant warblers (Siriwardena et al. 1998b), probably reflecting the influence of changes in their winter environment. Despite large short-term fluctuations in abundance, the CBC/BBS and CES both suggest that the population may be in long-term decline. The BBS PECBMS 2012a).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

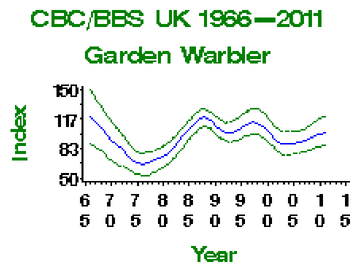
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	227	-12	-40	43		
	25	1985-2010	334	-5	-23	24		
	10	2000-2010	473	-2	-14	7		
	5	2005-2010	520	12	3	23		
CBC/BBS England	43	1967-2010	191	-18	-45	18		
	25	1985-2010	278	-14	-29	4		

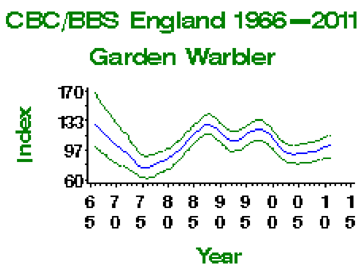
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	10	2000-2010	389	-9	-18	-1		
	5	2005-2010	429	8	1	17		
CES adults	26	1984-2010	64	-6	-35	32		
	25	1985-2010	65	-9	-36	21		
	10	2000-2010	64	-1	-16	15		
	5	2005-2010	62	5	-8	21		
CES juveniles	26	1984-2010	64	-35	-58	9		
	25	1985-2010	66	-27	-52	14		
	10	2000-2010	65	-8	-26	17		
	5	2005-2010	62	-11	-28	8		
BBS UK	15	1995-2010	441	-9	-21	5		
	10	2000-2010	465	-1	-12	7		
	5	2005-2010	520	12	3	21		
BBS England	15	1995-2010	358	-16	-24	-6		
	10	2000-2010	376	-9	-18	-1		
	5	2005-2010	419	7	0	15		
BBS Wales	15	1995-2010	56	-10	-39	28		
	10	2000-2010	58	9	-22	36		
	5	2005-2010	60	27	-2	60		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

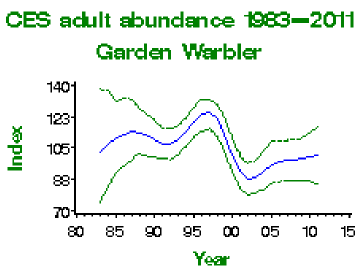
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



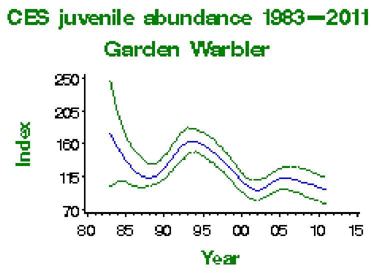
CBC/BBS UK graph



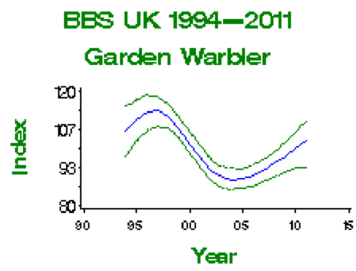
CBC/BBS England graph



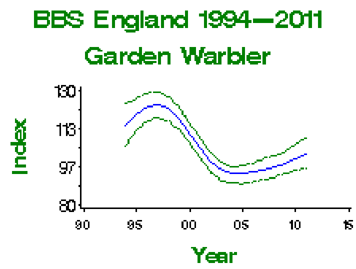
CES adults graph



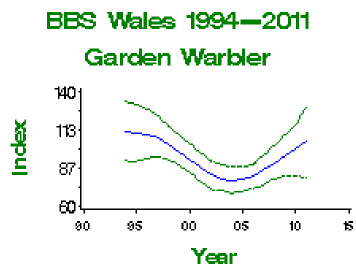
CES juveniles graph



BBS UK graph

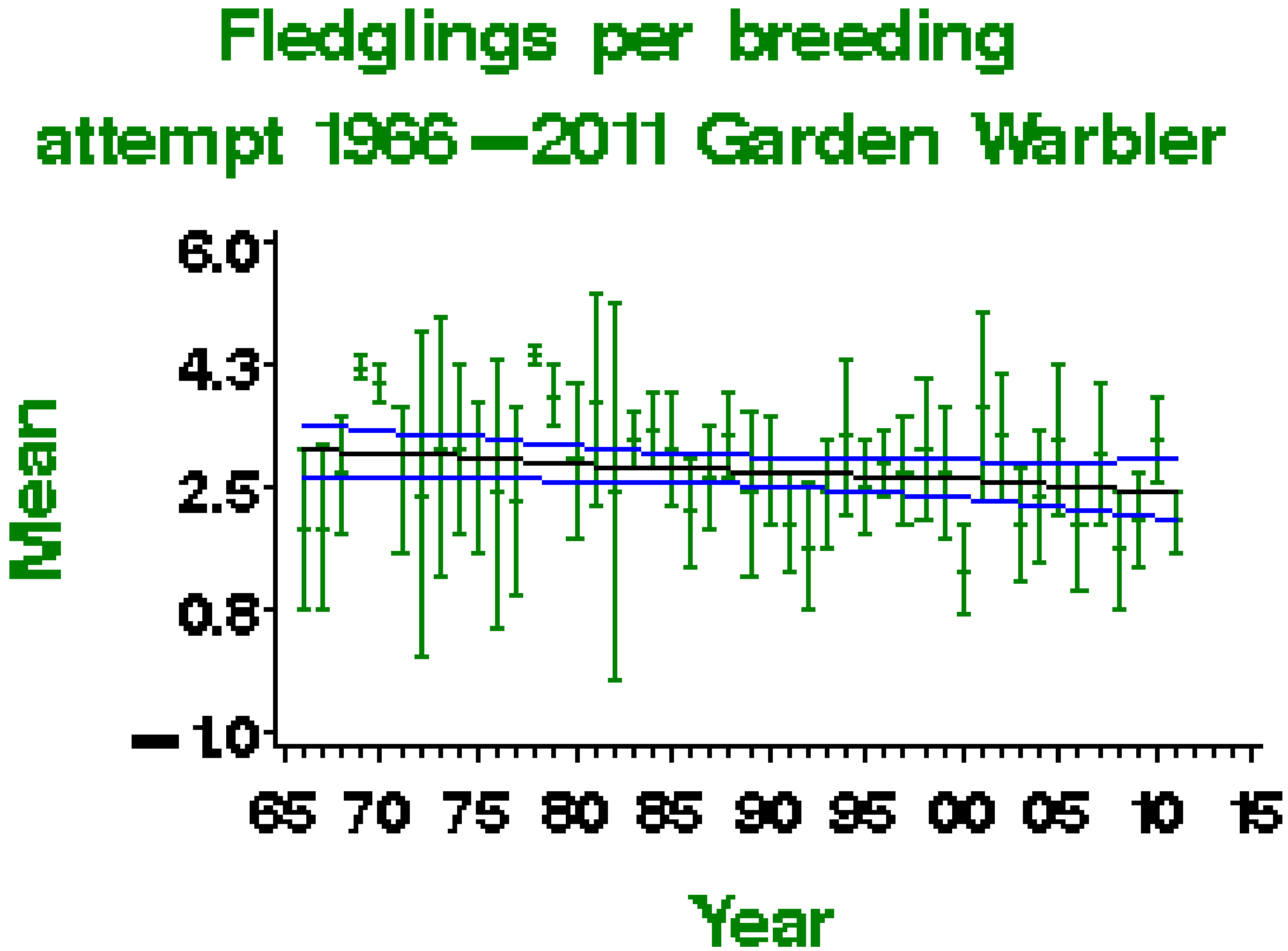


BBS England graph

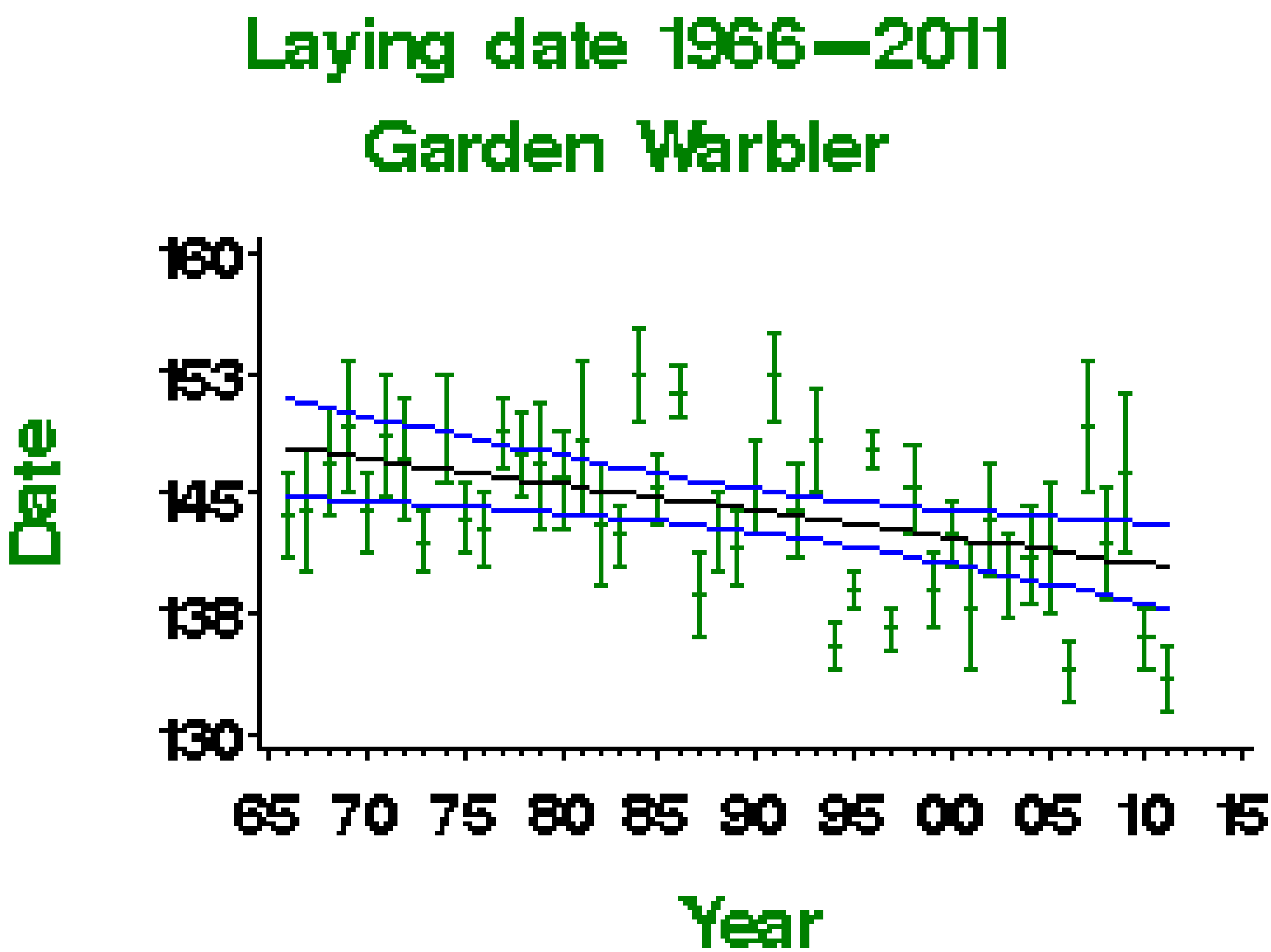


BBS Wales graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

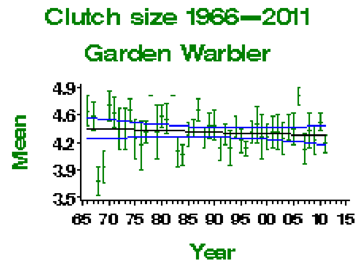


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

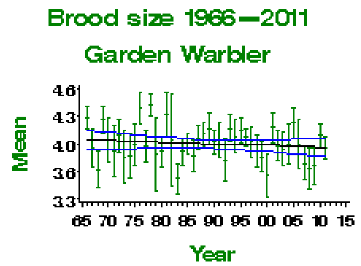
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	19	None					
Clutch size	42	1968-2010	17	None					Small sample
Brood size	42	1968-2010	25	None					Small sample
Nest failure rate at egg stage	42	1968-2010	23	None					Small sample
Nest failure rate at chick stage	42	1968-2010	20	Linear increase	1.11% nests/day	2.60% nests/day	134.2%		Small sample
Laying date	42	1968-2010	22	Linear decline	May 28	May 21	-7 days		Small sample
Juvenile to Adult ratio (CES)	26	1984-2010	78	Smoothed trend	207 Index value	100 Index value	-52%	>50	
Juvenile to Adult ratio (CES)	25	1985-2010	79	Smoothed trend	211 Index value	100 Index value	-53%	>50	
Juvenile to Adult ratio (CES)	10	2000-2010	79	Smoothed trend	105 Index value	100 Index value	-5%		
Juvenile to Adult ratio (CES)	5	2005-2010	76	Smoothed trend	137 Index value	100 Index value	-27%	>25	

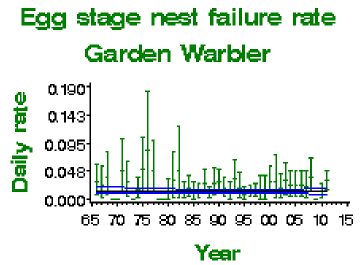
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



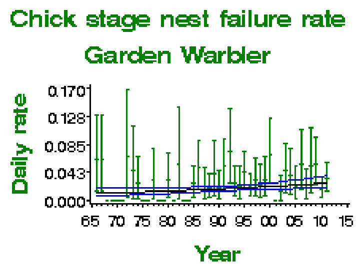
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



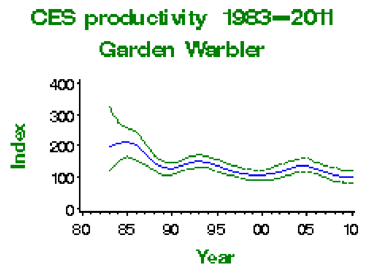
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



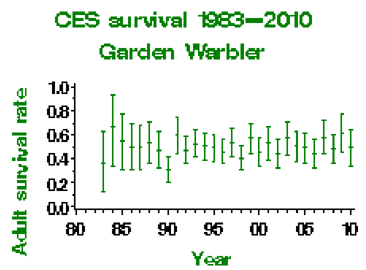
Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Smoothed long-term trend in ratio of juvenile:adult birds caught - green lines indicate 85% confidence limits



Proportion of adult birds surviving to following year - green bars represent 95% confidence limits

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Lesser Whitethroat

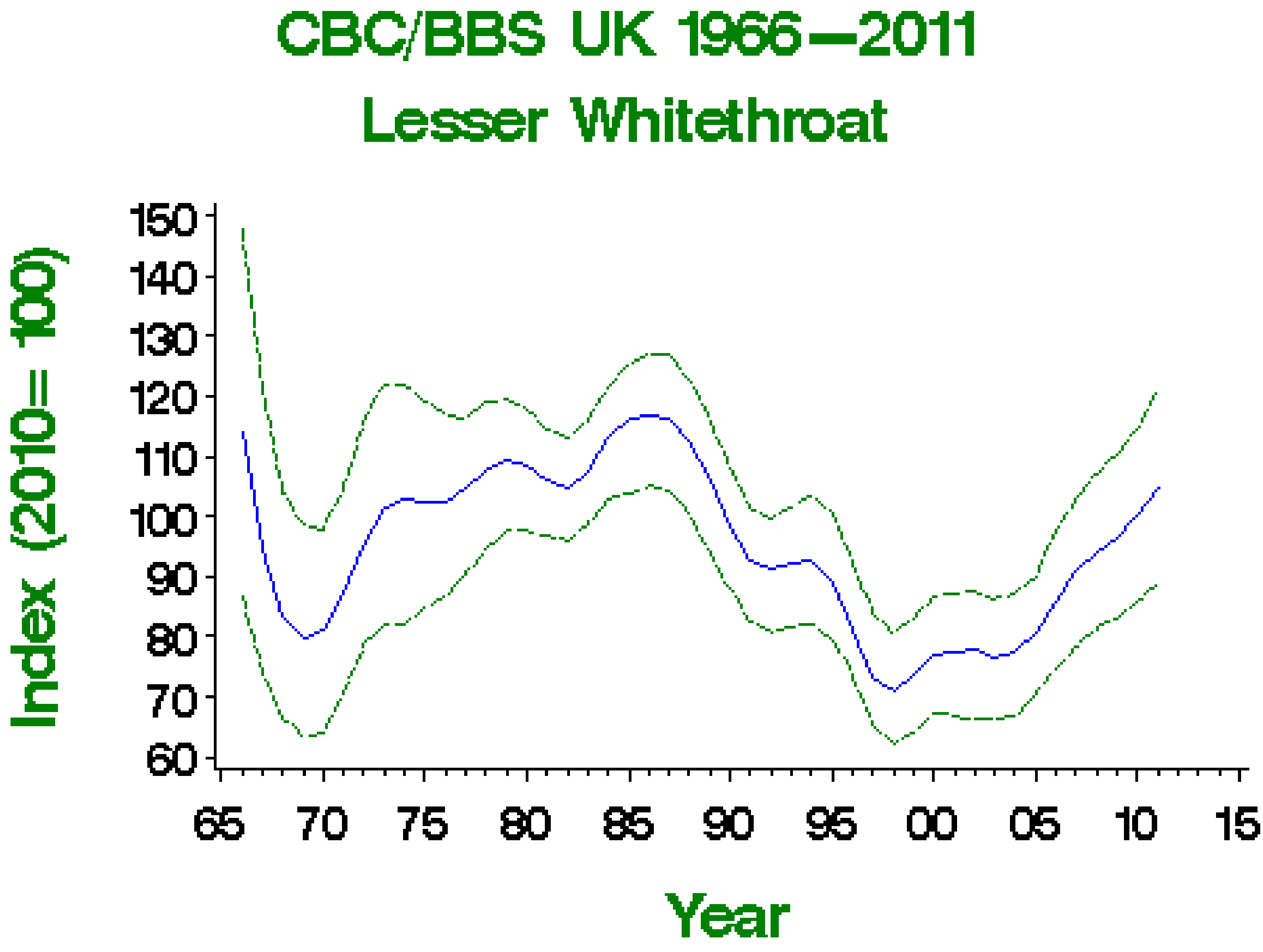
Sylvia curruca

Key facts

Conservation listings:	Europe: no SPEC category (not concentrated in Europe, conservation status favourable) (BiE04) UK: green (BoCC3)
Long-term trend:	UK, England: fluctuating, with no long-term trend
Population size:	74,000 territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Status summary

Lesser Whitethroat abundance was roughly stable (albeit with short-term fluctuations) from the 1960s until the late 1980s, but the CBC/BBS and CES trends provide evidence for a subsequent moderate decline that lasted into the late 1990s. These changes were statistically significant, and large enough over the relevant periods to trigger BTO alerts. BBS has subsequently shown a significant sharp upturn, but this contrasts strongly with the continued decrease recorded by CES ringers. Wide fluctuations in survival and productivity have been recorded by CES ringers, and may be influencing population change, but pressures during migration and in winter are the most likely causes of any decline (Fuller et al. 2005). There has been little long-term change across Europe since 1980 (PECBMS 2012a).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

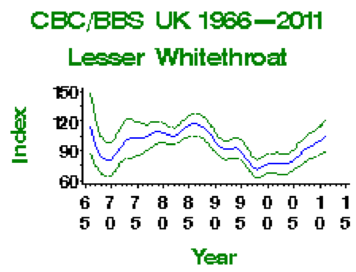
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	139	6	-29	53		
	25	1985-2010	200	-14	-29	6		
	10	2000-2010	297	30	14	47		
	5	2005-2010	337	24	13	37		

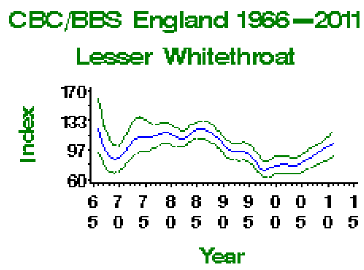
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	43	1967-2010	133	-1	-33	44		
	25	1985-2010	190	-18	-34	-1		
	10	2000-2010	283	29	14	42		
	5	2005-2010	322	25	14	35		
CES adults	26	1984-2010	38	-63	-79	-43	>50	
	25	1985-2010	39	-63	-77	-48	>50	
	10	2000-2010	33	-14	-34	7		
	5	2005-2010	31	-19	-33	-2		
CES juveniles	26	1984-2010	44	-52	-71	-16	>50	
	25	1985-2010	45	-54	-71	-27	>50	
	10	2000-2010	43	-14	-39	29		
	5	2005-2010	42	-5	-32	29		
BBS UK	15	1995-2010	260	8	-10	22		
	10	2000-2010	291	42	24	64		
	5	2005-2010	333	27	14	37		
BBS England	15	1995-2010	249	4	-12	15		
	10	2000-2010	278	37	22	52		
	5	2005-2010	320	24	12	35		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

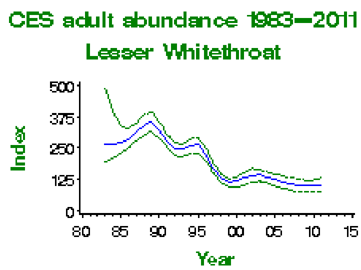
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



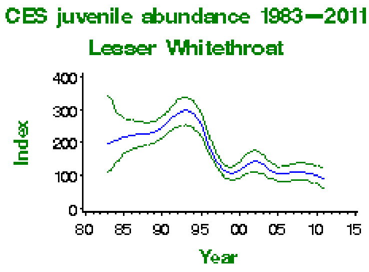
CBC/BBS UK graph



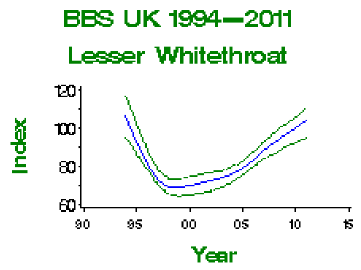
CBC/BBS England graph



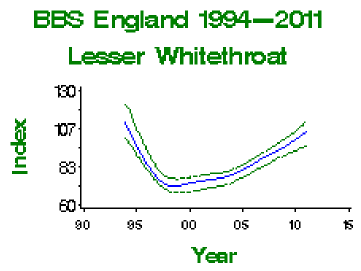
CES adults graph



CES juveniles graph



BBS UK graph

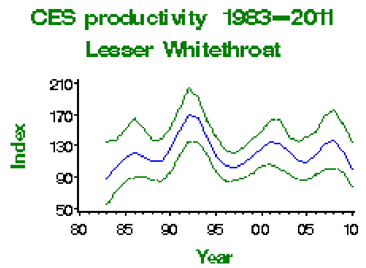


BBS England graph

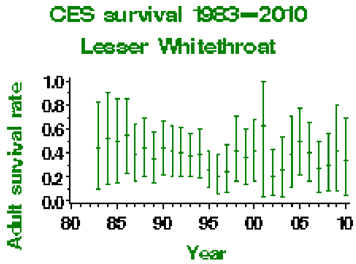
Demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Juvenile to Adult ratio (CES)	26	1984-2010	54	Smoothed trend	103 Index value	100 Index value	-3%		
Juvenile to Adult ratio (CES)	25	1985-2010	55	Smoothed trend	115 Index value	100 Index value	-13%		
Juvenile to Adult ratio (CES)	10	2000-2010	52	Smoothed trend	128 Index value	100 Index value	-22%		
Juvenile to Adult ratio (CES)	5	2005-2010	49	Smoothed trend	109 Index value	100 Index value	-8%		

For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



Smoothed long-term trend in ratio of juvenile:adult birds caught - green lines indicate 85% confidence limits



Proportion of adult birds surviving to following year - green bars represent 95% confidence limits

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Whitethroat

Sylvia communis

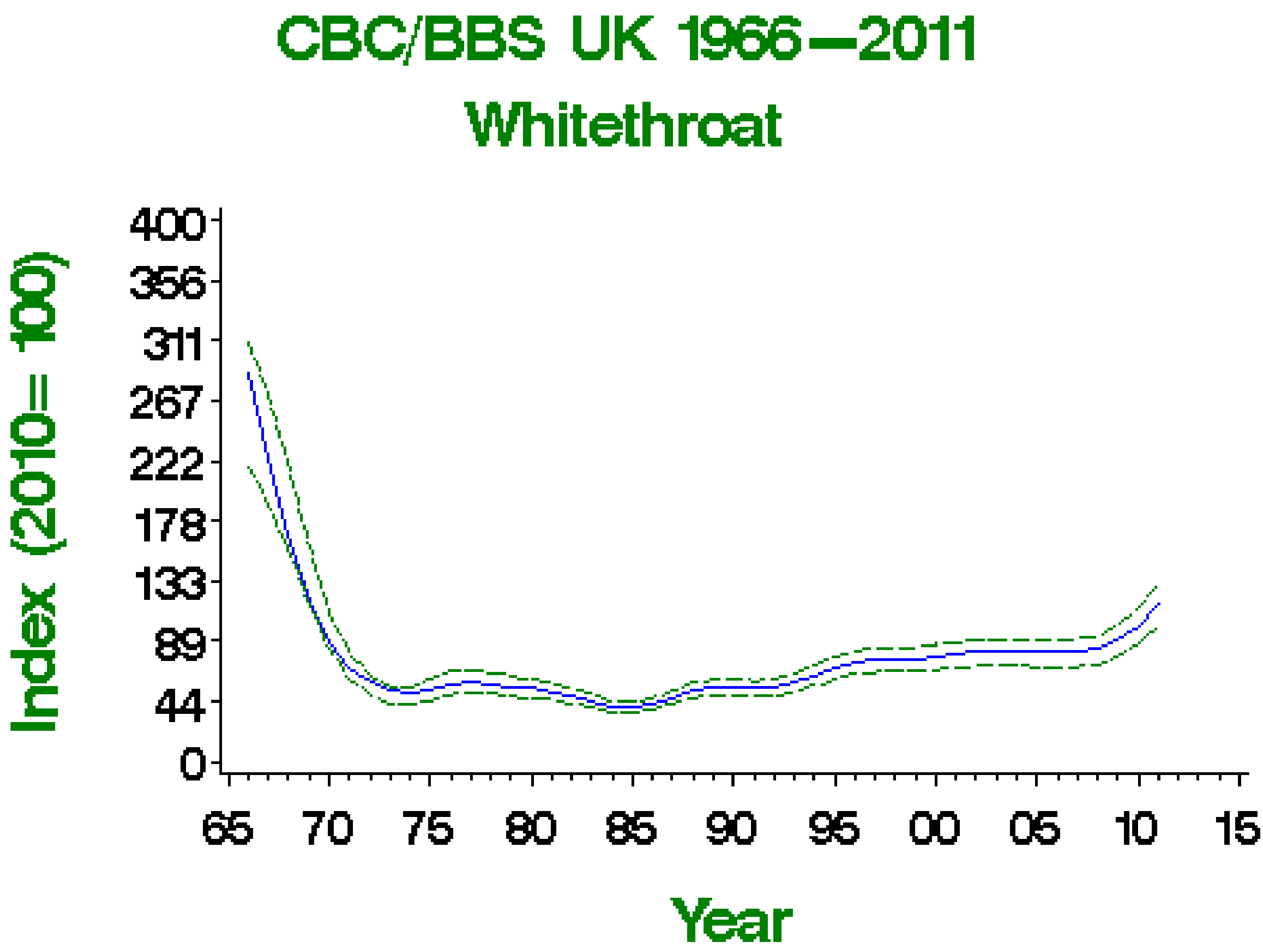
Key facts

Conservation listings:	Europe: no SPEC category (concentrated in Europe, conservation status favourable) (BiE04) UK: amber (25-50% decline, 1969-2006) (BoCC3)
Long-term trend:	UK, England: rapid decline, followed by increase
Population size:	1.1 million territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Migrant status:	Long-distance migrant
Nesting habitat:	Above-ground nester
Primary breeding habitat:	Farmland
Secondary breeding habitat:	
Breeding diet:	Animal
Winter diet:	Animal

Status summary

Whitethroat numbers had been stable for a few years up to 1968 but, despite a normal departure for their wintering grounds in West Africa, crashed by around 70% between the 1968 and 1969 breeding seasons. They fluctuated around their lower level until the mid 1980s, since when the population has sustained a consistent shallow recovery. Recovery of the UK population has been most apparent along linear waterways. The BBS PECBMS 2012a). The limited extent of UK recovery, coupled with change in the BoCC criteria, has resulted in the species moving from the green to the amber list at the latest review (Eaton et al. 2009).



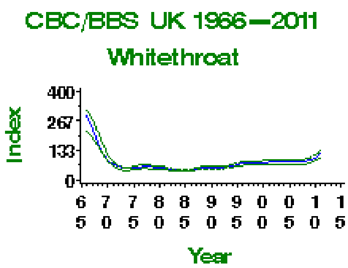
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

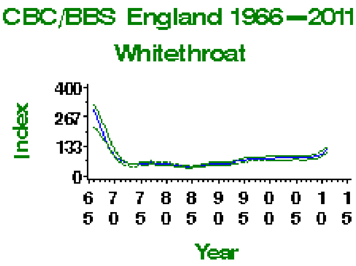
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	565	-55	-68	-38	>50	
	25	1985-2010	882	151	112	197		
	10	2000-2010	1464	28	25	36		
	5	2005-2010	1653	23	21	30		
CBC/BBS England	43	1967-2010	489	-56	-68	-38	>50	
	25	1985-2010	762	154	115	212		
	10	2000-2010	1259	26	22	33		
	5	2005-2010	1421	22	21	28		
WBS/WBBS waterways	35	1975-2010	79	161	22	357		
	25	1985-2010	100	336	206	533		
	10	2000-2010	160	25	10	35		
	5	2005-2010	159	16	8	25		
CES adults	26	1984-2010	61	-22	-46	-1		
	25	1985-2010	63	-6	-33	23		
	10	2000-2010	68	35	11	63		
	5	2005-2010	65	19	4	34		
CES juveniles	26	1984-2010	66	57	-21	225		
	25	1985-2010	68	70	-13	319		
	10	2000-2010	72	83	36	158		
	5	2005-2010	68	38	10	88		
BBS UK	15	1995-2010	1300	43	36	53		
	10	2000-2010	1444	29	25	37		
	5	2005-2010	1636	24	22	31		
BBS England	15	1995-2010	1124	39	33	49		
	10	2000-2010	1246	27	22	34		
	5	2005-2010	1413	23	21	29		
BBS Scotland	15	1995-2010	76	121	64	191		
	10	2000-2010	85	49	24	92		
	5	2005-2010	99	21	7	42		
BBS Wales	15	1995-2010	81	6	-11	29		
	10	2000-2010	90	21	6	42		
	5	2005-2010	99	47	35	66		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

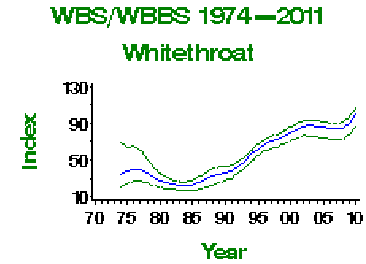
BTO JNCC rspb The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



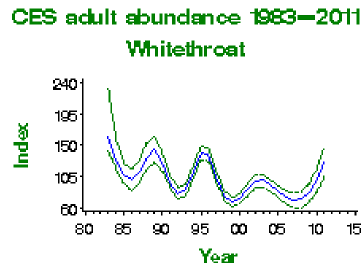
CBC/BBS UK graph



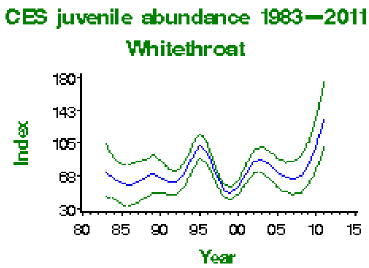
CBC/BBS England graph



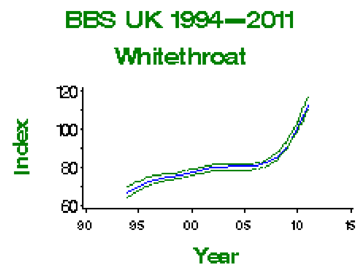
WBS/WBBS waterways graph



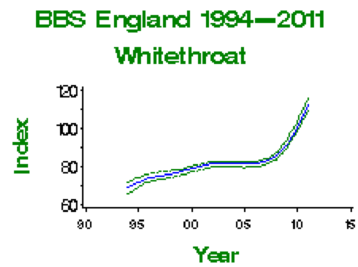
CES adults graph



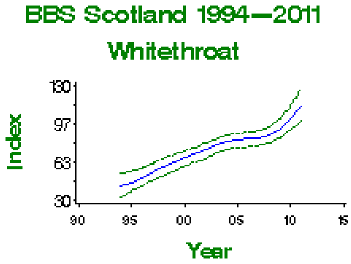
CES juveniles graph



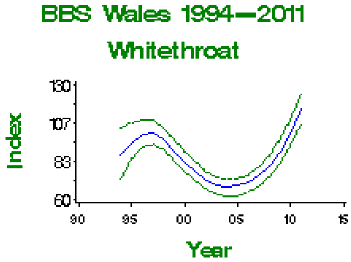
BBS UK graph



BBS England graph

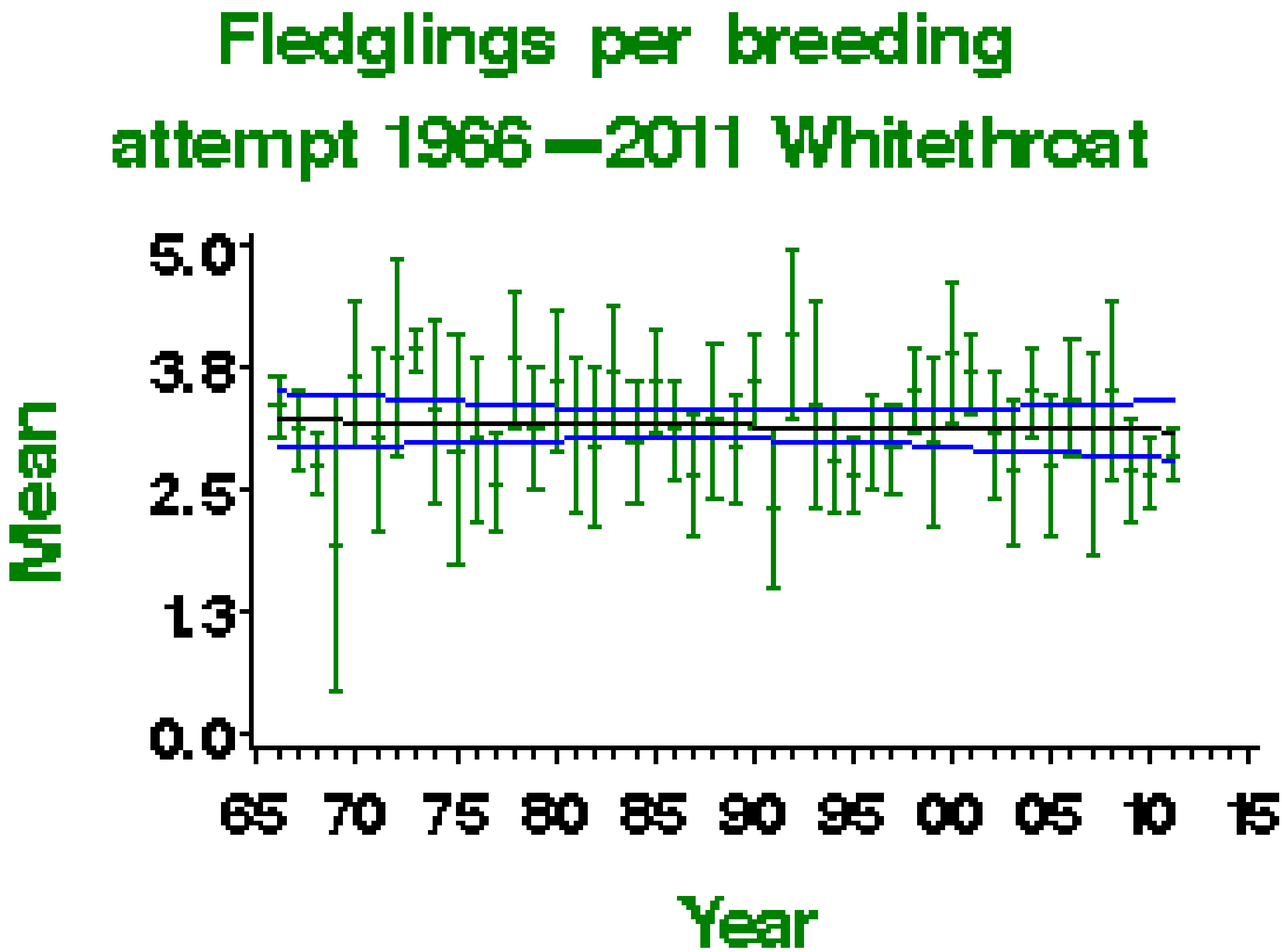


BBS Scotland graph

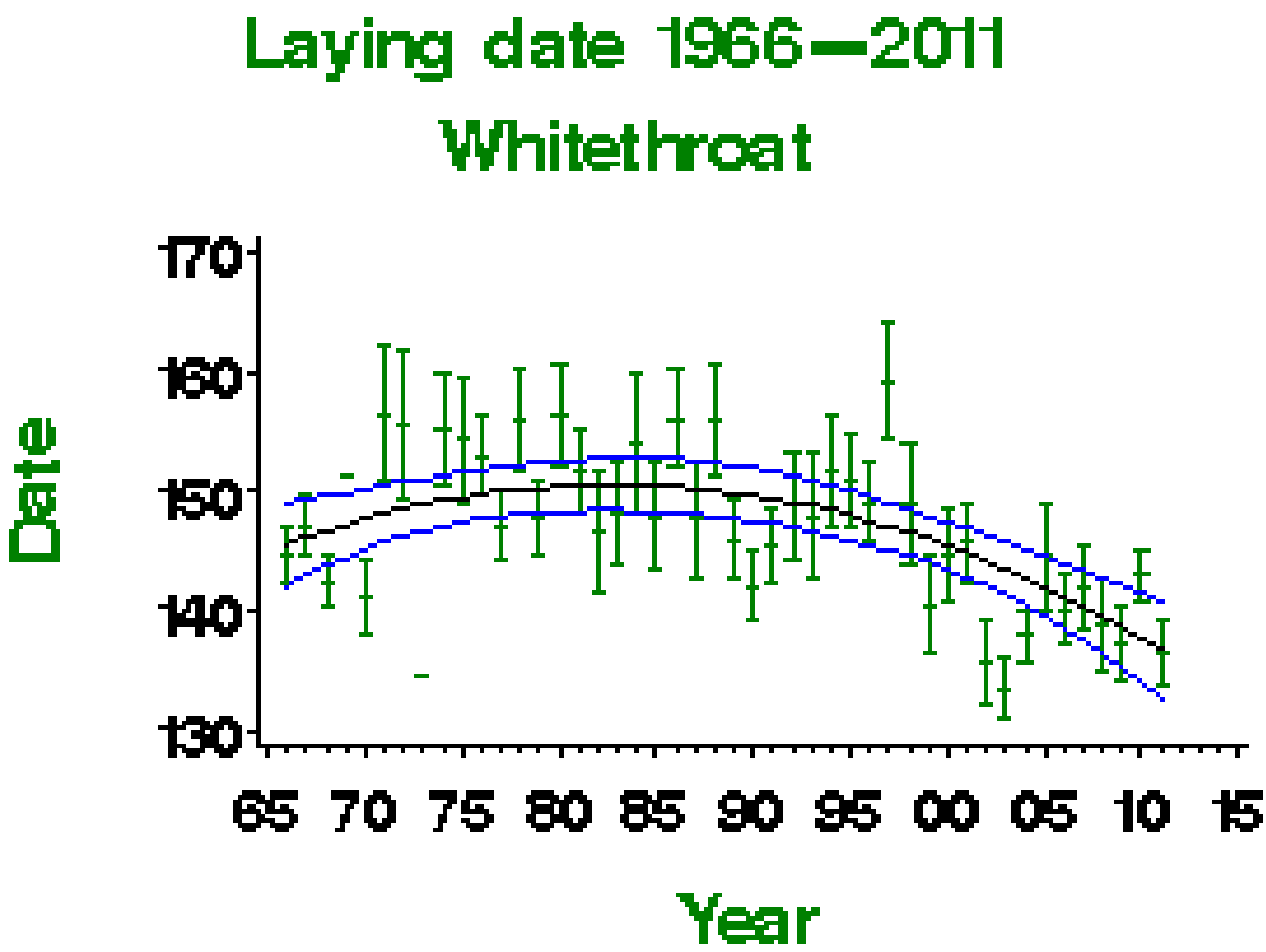


BBS Wales graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

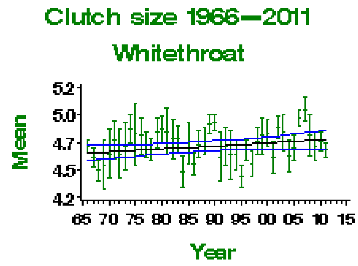


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

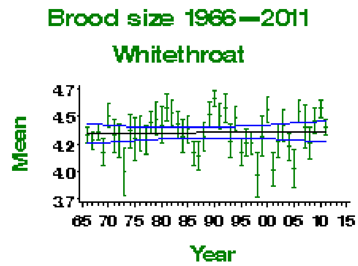
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	42	None					
Clutch size	42	1968-2010	31	None					
Brood size	42	1968-2010	67	None					
Nest failure rate at egg stage	42	1968-2010	43	Curvilinear	1.03% nests/day	1.75% nests/day	69.9%		
Nest failure rate at chick stage	42	1968-2010	50	None					
Laying date	42	1968-2010	20	Curvilinear	May 27	May 18	-9 days		Small sample
Juvenile to Adult ratio (CES)	26	1984-2010	76	Smoothed trend	65 Index value	100 Index value	54%		
Juvenile to Adult ratio (CES)	25	1985-2010	78	Smoothed trend	94 Index value	100 Index value	7%		
Juvenile to Adult ratio (CES)	10	2000-2010	83	Smoothed trend	96 Index value	100 Index value	4%		
Juvenile to Adult ratio (CES)	5	2005-2010	78	Smoothed trend	79 Index value	100 Index value	26%		

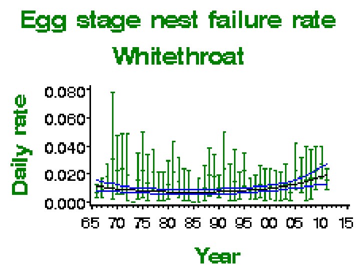
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



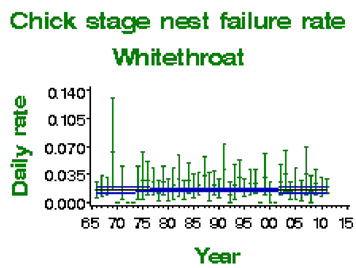
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



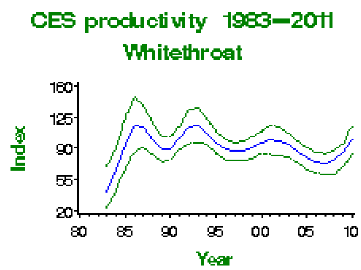
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



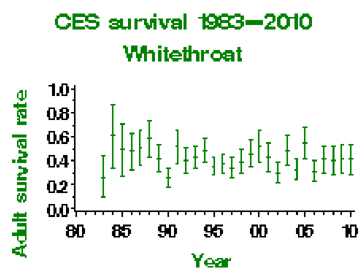
Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Smoothed long-term trend in ratio of juvenile:adult birds caught - green lines indicate 85% confidence limits



Proportion of adult birds surviving to following year - green bars represent 95% confidence limits

Causes of change

There is good evidence that the major changes in the population of this species have been driven by conditions on its wintering grounds and so are related to overwinter survival.

Change factor	Primary driver	Secondary driver
Demographic	Decreased survival	
Ecological	Changes on wintering grounds	

Further information on causes of change

In a pioneering study, Winstanley et al. (1974) provided good evidence to link the 1969 crash to drought in the Whitethroat's wintering grounds in the western Sahel, just south of the Sahara Desert. Correspondingly, Baillie & Peach (1992) found that breeding performance was poorly correlated with population changes. They found that fluctuations in losses of adult birds were correlated with conditions on the wintering grounds, and were correlated with Sahel rainfall. Thus, the population appears to be limited by food resources on the wintering grounds, because rainfall in the dry Sahelian landscape promotes greater invertebrate abundance. There has been no long-term trend in the number of fledglings per breeding attempt (see above). Productivity, as measured by CES, rose during the 1980s and has since fluctuated and fallen back.

More recent work has provided good evidence that the density of Whitethroats wintering in the Sahel is correlated with the number and size of trees, and that the increase in overall density of trees was related to an increase in Whitethroats in the area (Stevens et al. 2010). Wilson & Cresswell (2006) found that Whitethroats were most common in areas with intermediate tree heights. They suggest that Whitethroats appear to be able to survive in extremely degraded habitats, yet may be vulnerable to the disappearance of Salvadora trees, the fruit of which assists pre-migratory fattening. This is likely to be a separate mechanism to the earlier rainfall mechanism contributing to the population decline and is probably linked to the more recent gradual increase.

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Grasshopper Warbler

Locustella naevia

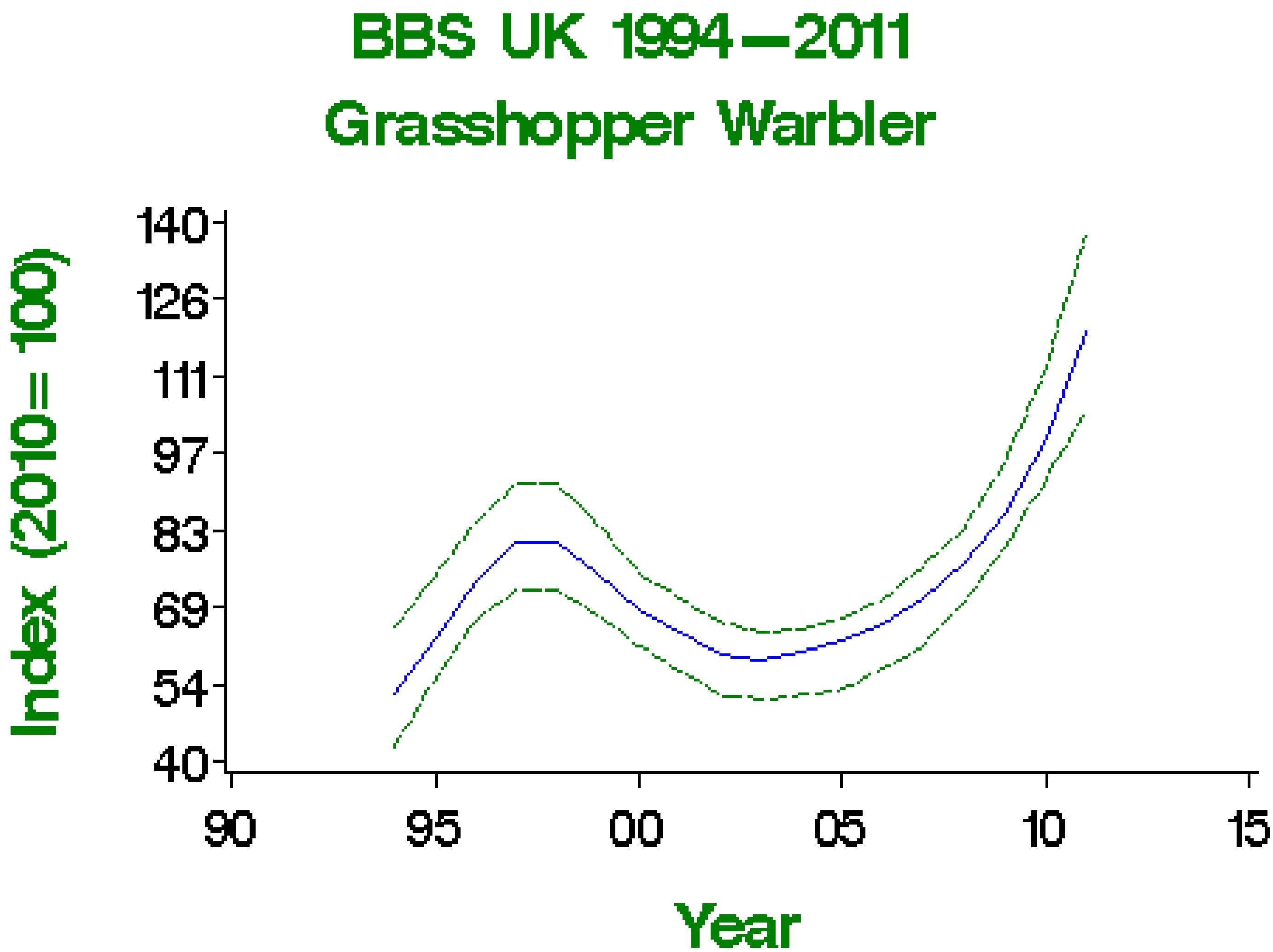
Key facts

Conservation listings:	Europe: no SPEC category (concentrated in Europe, conservation status favourable) (BiE04) UK: red (>50% population decline) (BoCC3) UK Biodiversity Action Plan: priority species
Long-term trend:	UK: rapid decline
Population size:	16,000 territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Migrant status:	Long-distance migrant
Nesting habitat:	Above-ground nester
Primary breeding habitat:	Wetland
Secondary breeding habitat:	
Breeding diet:	Animal
Winter diet:	Animal

Status summary

Grasshopper Warbler was previously amber-listed because of a contraction in range during the period preceding the 1988-91 Atlas (Gibbons et al. 1993). The CBC index suffered from small and severely dwindling sample sizes, but the available data indicate a rapid population decline between the mid 1960s and mid 1980s, when numbers became too small for annual monitoring (Marchant et al. 1990). On this basis, the species is now red-listed. The BBS shows wide fluctuations in abundance since 1994, and currently an overall strong increase. There has been little long-term change across Europe since 1980 (PECBMS 2012a).



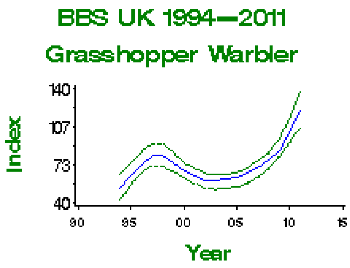
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

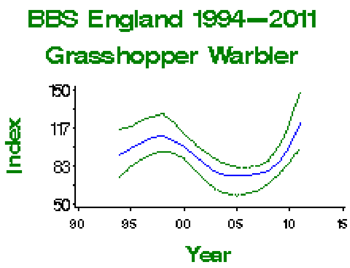
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	15	1995-2010	76	59	22	107		
	10	2000-2010	81	47	22	83		
	5	2005-2010	94	60	43	102		
BBS England	15	1995-2010	34	1	-26	42		
	10	2000-2010	36	1	-20	32		
	5	2005-2010	44	35	16	106		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



BBS UK graph



BBS England graph

Demographic trends

Productivity and survival trends for this species are not currently produced by BTO

Causes of change

The demographic and ecological causes of population change in this species are largely unknown.

Change factor	Primary driver	Secondary driver
Demographic	Unknown	
Ecological	Unknown	

Further information on causes of change

There are not enough data to carry out demographic analyses for this species and the causes of the decline, both demographic and ecological, are largely unknown.

Although there is no specific evidence available, as this species is a migrant, it is possible that it has suffered from changes in conditions in the African Sahel zone along with some other trans-Saharan migrants.

Another hypothesis, again lacking good evidence to support or refute this, is that the decline is related to a recent decrease in the amount of suitable scrub habitat preferred by breeding Grasshopper Warblers. There are strong pointers that structural aspects of preferred habitat are important, including heterogeneity, and it seems likely that breeding habitat is limited, at least in some parts of Britain (Gilbert 2012). However, the Grasshopper Warbler's decline has been fairly steep and perhaps too rapid for gradual changes in scrub habitat availability or post-afforestation decline to be major factors (Riddiford 1983).

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Sedge Warbler

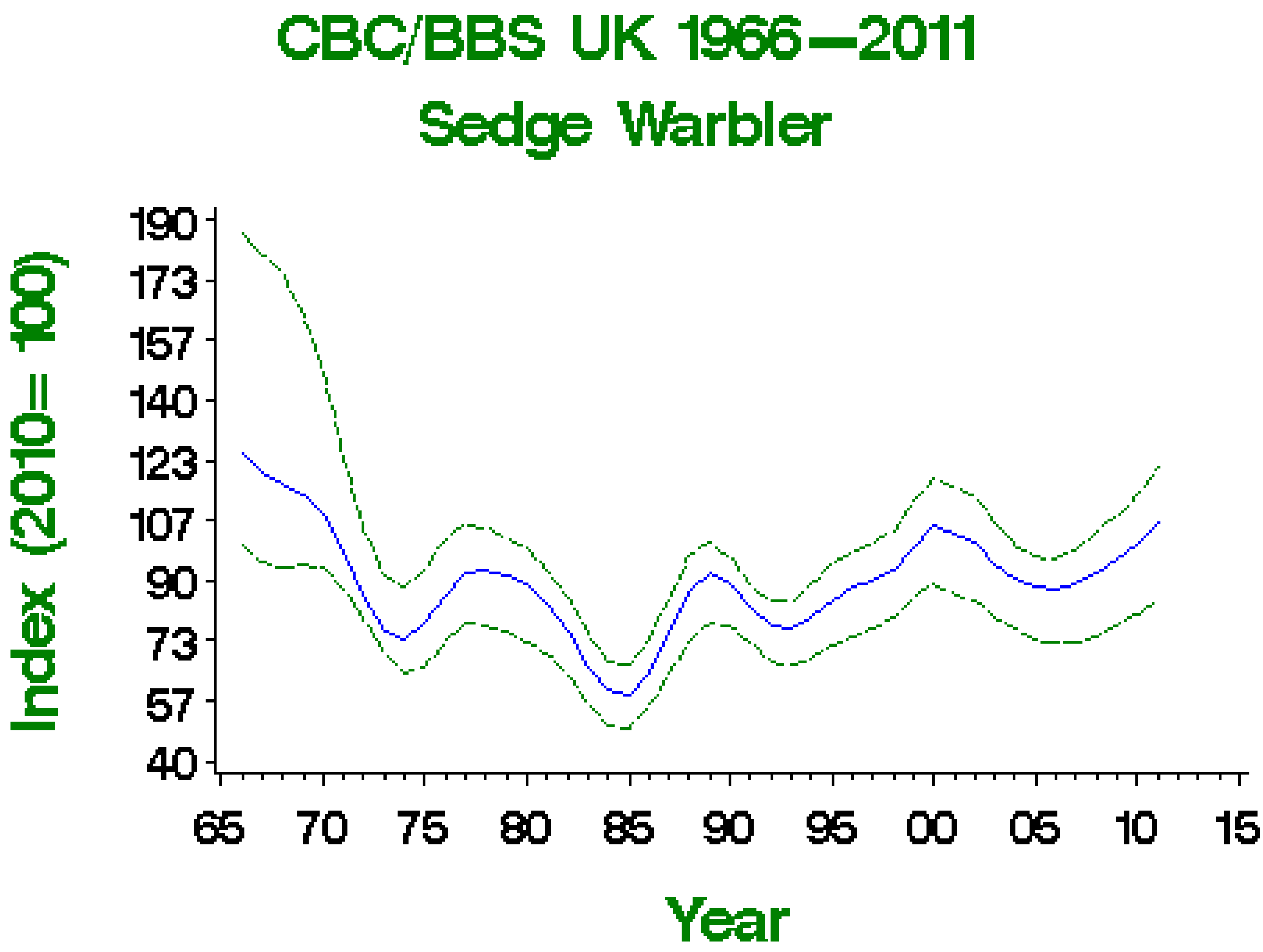
Acrocephalus schoenobaenus

Key facts

Conservation listings:	Europe: no SPEC category (concentrated in Europe, conservation status favourable) (BiE04) UK: green (BoCC3)
Long-term trend:	UK: shallow decline England: moderate decline
Population size:	290,000 territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Status summary

The trend in England is apparently of moderate decline, but this is uncertain because the long-term changes are partly obscured by shorter fluctuations in numbers. Detailed analysis of BTO data sets has shown that much of the year-to-year variation in population size is driven by changes in adult survival rates which, in turn, are related to changes in rainfall on their wintering grounds, just south of the Sahara Desert, in the West African Sahel (Peach et al. 1991). The smoothed CBC/BBS and WBS/WBBS trends show four troughs in population, related to years of poor West African rainfall, with a low point in 1984-85. The CES, which provides the biggest Sedge Warbler sample, shows the most recent three of the same troughs. Daily nest failure rates at the egg stage have halved, and the numbers of fledglings per breeding attempt has shown linear increase. CES productivity data show a sustained decrease since the late 1980s. There has been little long-term change across Europe since 1980 (PECBMS 2012a).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

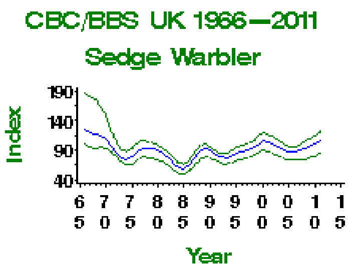
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	142	-16	-56	16		
	25	1985-2010	208	71	25	126		
	10	2000-2010	320	-5	-19	4		

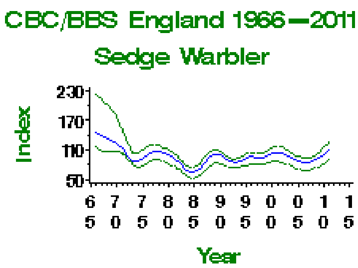
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	43	1967-2010	96	-27	-62	2		
	25	1985-2010	135	56	16	111		
	10	2000-2010	205	-4	-17	9		
	5	2005-2010	224	15	3	29		
WBS/WBBS waterways	35	1975-2010	69	-30	-50	-5	>25	
	25	1985-2010	84	-4	-24	20		
	10	2000-2010	120	-15	-28	-5		
	5	2005-2010	112	10	-2	21		
CES adults	26	1984-2010	65	-39	-56	-21	>25	
	25	1985-2010	67	-41	-55	-28	>25	
	10	2000-2010	72	-29	-38	-22	>25	
	5	2005-2010	69	-18	-27	-10		
CES juveniles	26	1984-2010	64	70	-12	463		
	25	1985-2010	65	59	-6	209		
	10	2000-2010	70	9	-13	36		
	5	2005-2010	67	12	-10	34		
BBS UK	15	1995-2010	293	14	-2	36		
	10	2000-2010	313	-1	-14	9		
	5	2005-2010	342	12	3	20		
BBS England	15	1995-2010	187	4	-14	27		
	10	2000-2010	201	0	-13	13		
	5	2005-2010	220	13	1	25		
BBS Scotland	15	1995-2010	53	36	-9	90		
	10	2000-2010	54	0	-30	20		
	5	2005-2010	61	14	-8	36		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

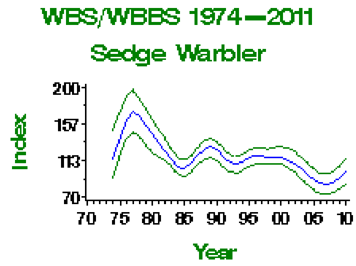
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



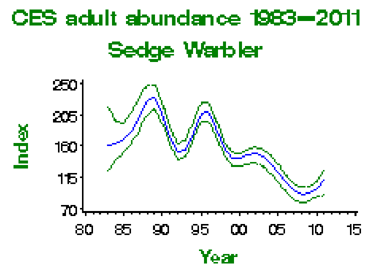
CBC/BBS UK graph



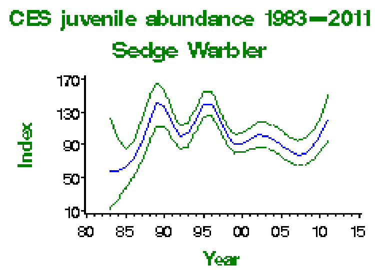
CBC/BBS England graph



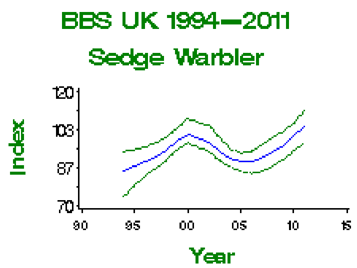
WBS/WBBS waterways graph



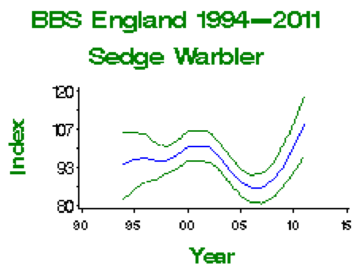
CES adults graph



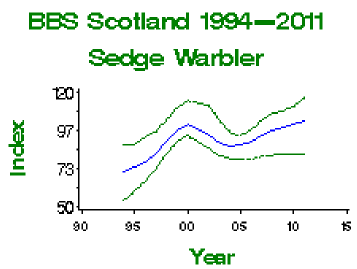
CES juveniles graph



BBS UK graph

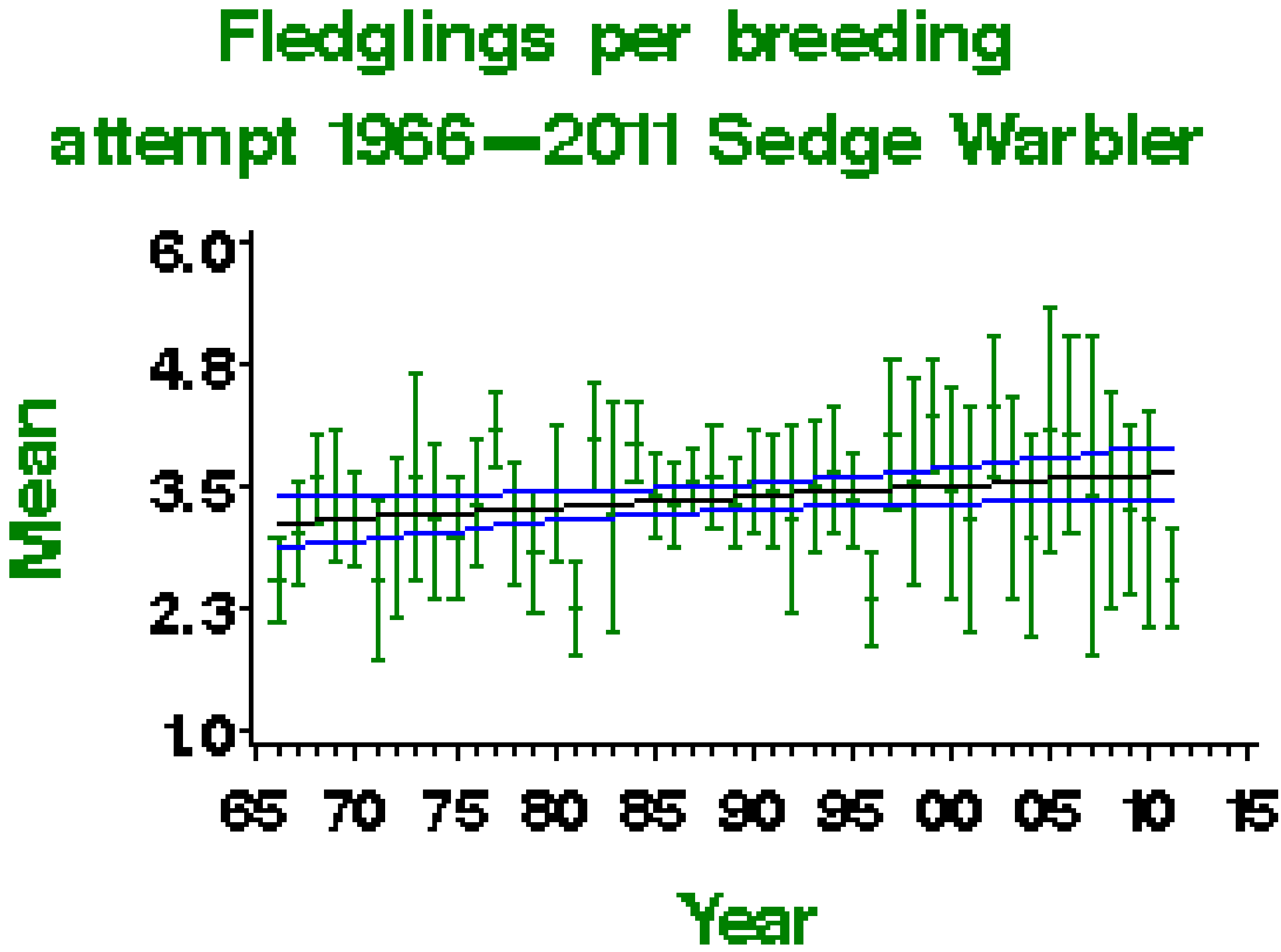


BBS England graph

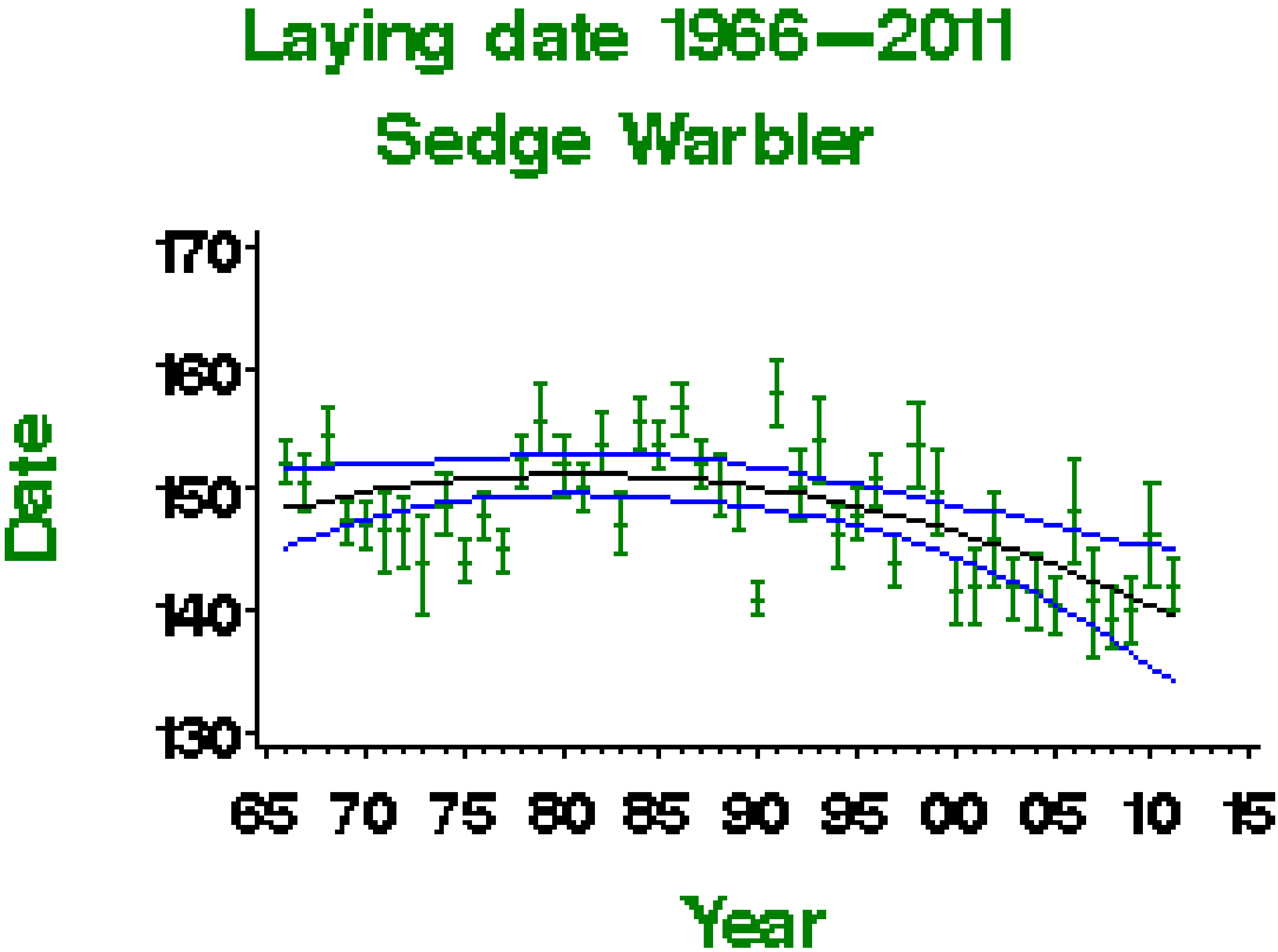


BBS Scotland graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

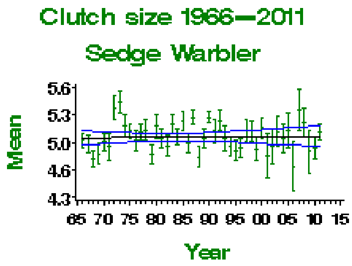


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

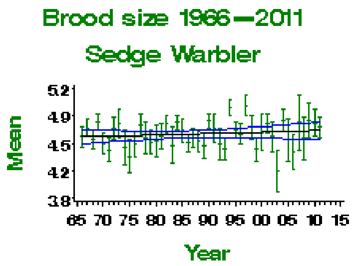
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	39	Linear increase	3.17 fledglings	3.64 fledglings	15.1%		
Clutch size	42	1968-2010	35	None					
Brood size	42	1968-2010	55	None					
Nest failure rate at egg stage	42	1968-2010	41	Curvilinear	1.44% nests/day	1.14% nests/day	-20.8%		
Nest failure rate at chick stage	42	1968-2010	47	None					
Laying date	42	1968-2010	47	Curvilinear	May 29	May 20	-9 days		
Juvenile to Adult ratio (CES)	26	1984-2010	71	Smoothed trend	232 Index value	100 Index value	-57%	>50	
Juvenile to Adult ratio (CES)	25	1985-2010	73	Smoothed trend	197 Index value	100 Index value	-49%	>25	
Juvenile to Adult ratio (CES)	10	2000-2010	79	Smoothed trend	106 Index value	100 Index value	-6%		
Juvenile to Adult ratio (CES)	5	2005-2010	77	Smoothed trend	103 Index value	100 Index value	-3%		

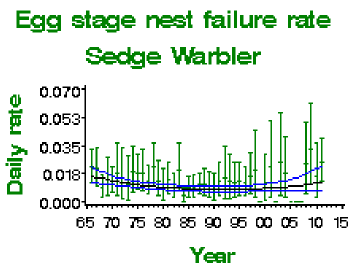
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



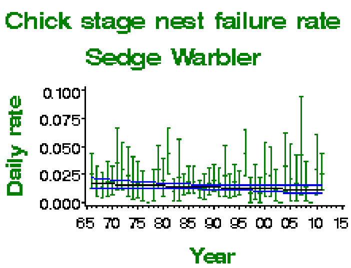
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



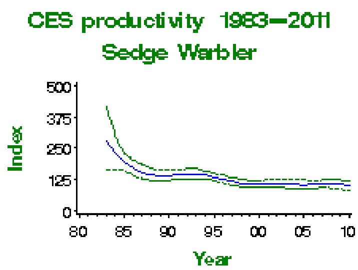
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



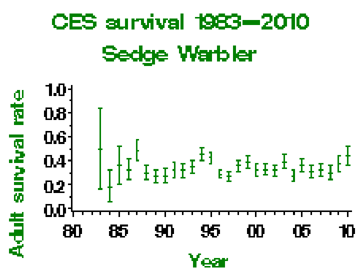
Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Smoothed long-term trend in ratio of juvenile:adult birds caught - green lines indicate 85% confidence limits



Proportion of adult birds surviving to following year - green bars represent 95% confidence limits

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Reed Warbler

Acrocephalus scirpaceus

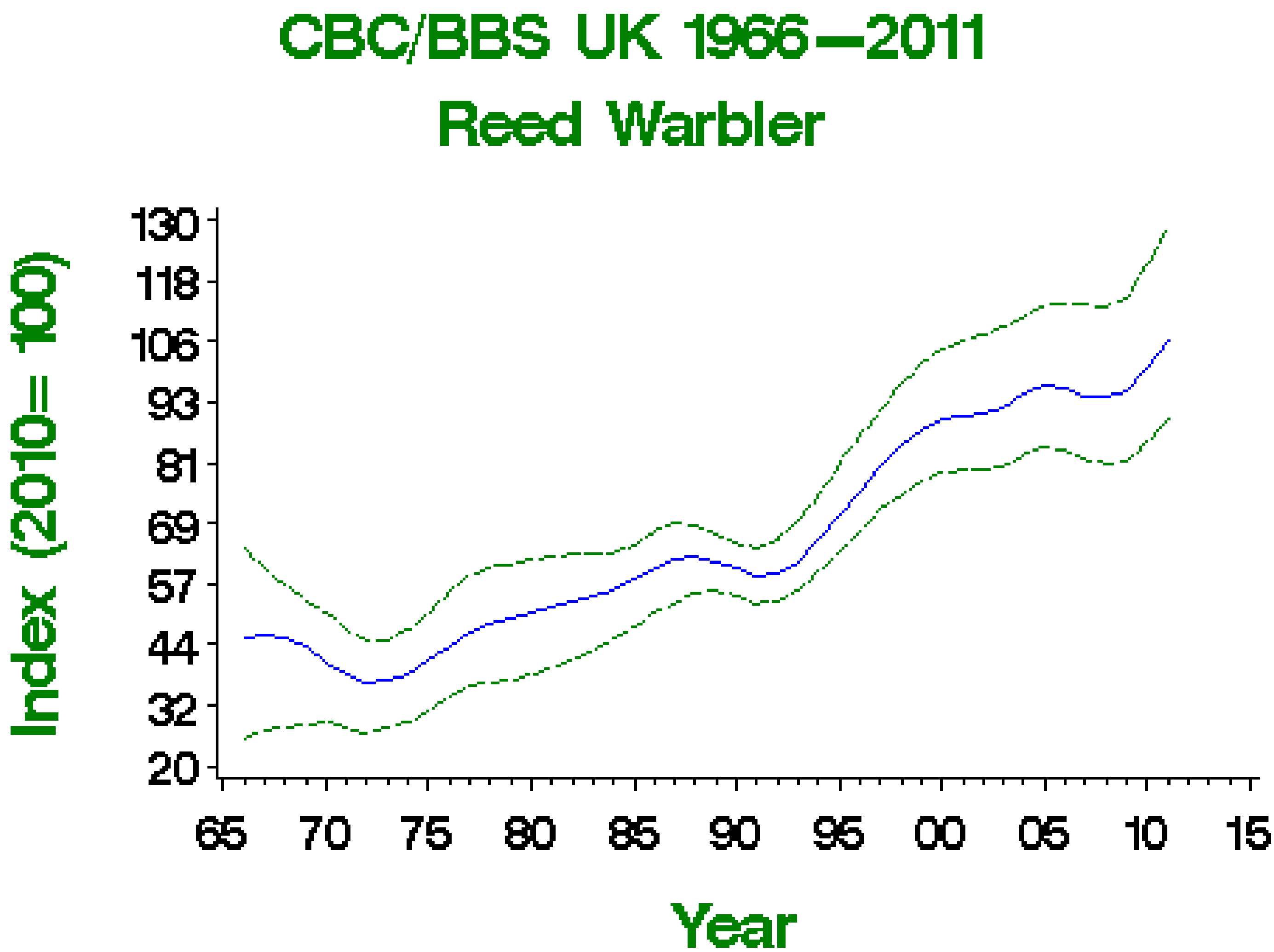
Key facts

Conservation listings:	Europe: no SPEC category (concentrated in Europe, conservation status favourable) (BiE04) UK: green (BoCC3)
Long-term trend:	UK: probable rapid increase
Population size:	130,000 (100,000-160,000) pairs in 2009 (APEP13: distance sampling estimate for 2006 (Newson et al. 2008) updated using BBS trend)

Migrant status:	Long-distance migrant
Nesting habitat:	Above-ground nester
Primary breeding habitat:	Wetland
Secondary breeding habitat:	
Breeding diet:	Animal
Winter diet:	Animal

Status summary

This species has an unusually clumped distribution, with very high breeding concentrations in Phragmites reedbeds, where numbers are very hard to census. CES, which has many sites in reedbeds, ought perhaps be a better measure of population change than either CBC/BBS or WBS/WBBS, where the species is encountered mainly at low density or in linear habitats. Both CBC/BBS and WBS/WBBS show progressive moderate increases. CES, however, shows a decline from 1983 until the early 1990s, followed by a partial recovery, and another more recent decline. Population increase, as indicated by the census work, accords with the remarkable range expansion the species has achieved since the 1960s, as recorded by atlas projects. West Wales, northwest and northeast England were colonised, as was the east coast of Ireland, between 1968-72 and 1988-91 (Gibbons et al. 1993), and the species is now regular as far north as the Tay reedbeds (Robertson 2003). There has been little long-term change across Europe since 1980 (PECBMS 2012a).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	63	116	40	377		
	25	1985-2010	93	74	35	161		
	10	2000-2010	145	11	-5	27		
	5	2005-2010	166	4	-10	19		
CBC/BBS England	43	1967-2010	60	91	33	220		
	25	1985-2010	89	60	30	114		
	10	2000-2010	137	12	1	27		
	5	2005-2010	157	9	-1	22		
WBS/WBBS waterways	29	1981-2010	42	93	14	305		
	25	1985-2010	47	93	18	314		
	10	2000-2010	72	1	-14	21		
	5	2005-2010	70	5	-6	22		
CES adults	26	1984-2010	55	-30	-44	-12	>25	
	25	1985-2010	56	-27	-42	-9	>25	
	10	2000-2010	61	-17	-25	-7		
	5	2005-2010	60	-1	-9	9		
CES juveniles	26	1984-2010	57	55	-23	253		
	25	1985-2010	59	53	-7	155		
	10	2000-2010	63	-6	-24	17		
	5	2005-2010	64	10	-9	34		
BBS UK	15	1995-2010	125	36	17	60		
	10	2000-2010	143	16	3	32		
	5	2005-2010	166	6	-4	18		
BBS England	15	1995-2010	119	33	13	58		
	10	2000-2010	135	16	0	33		
	5	2005-2010	157	10	-2	23		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

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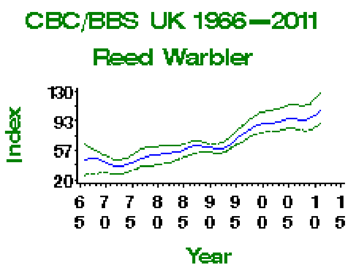
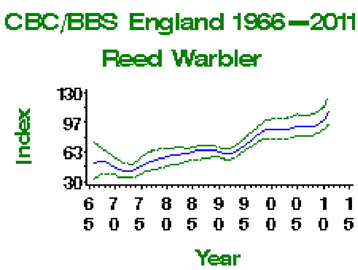
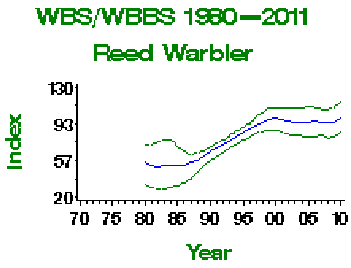


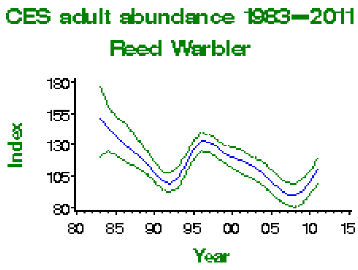
CBC/BBS UK graph



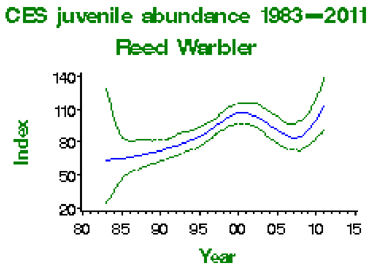
CBC/BBS England graph



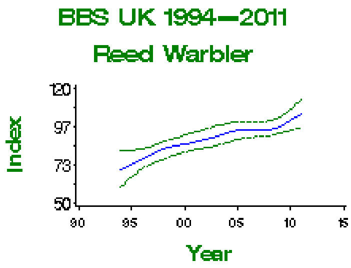
WBS/WBBS waterways graph



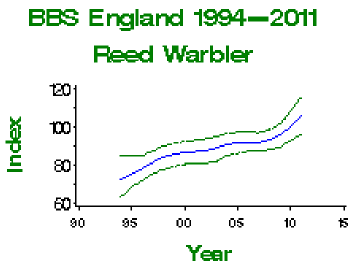
CES adults graph



CES juveniles graph



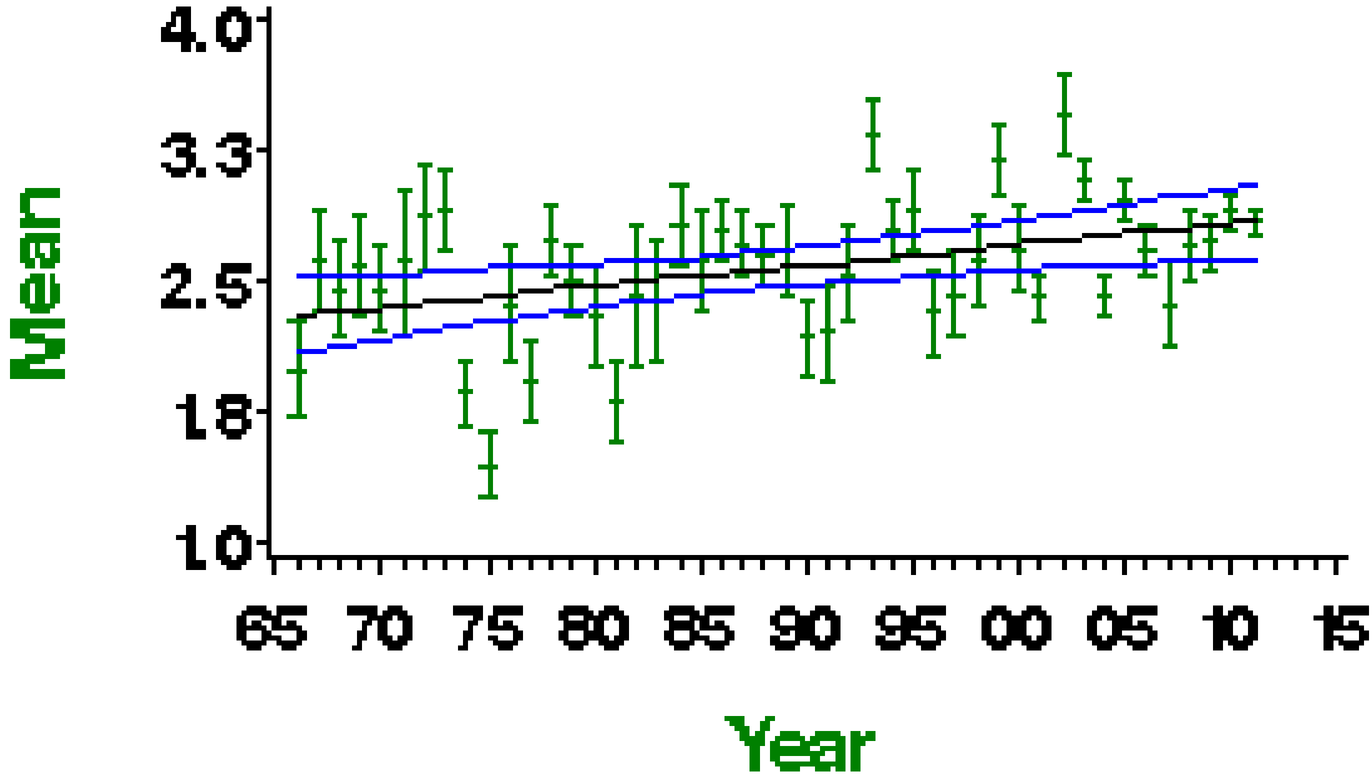
BBS UK graph



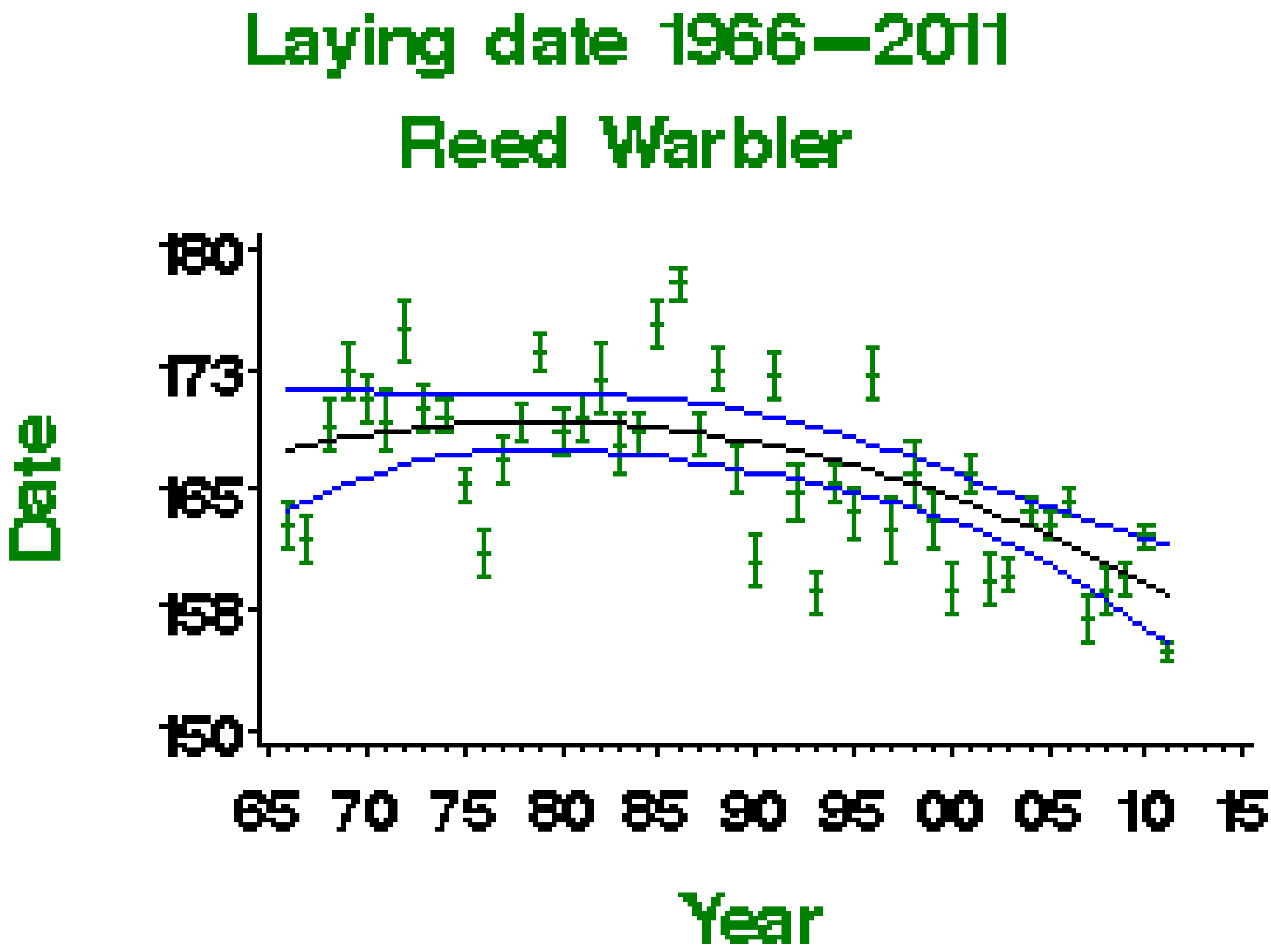
BBS England graph

Demographic trends

Fledglings per breeding attempt 1966–2011 Reed Warbler



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

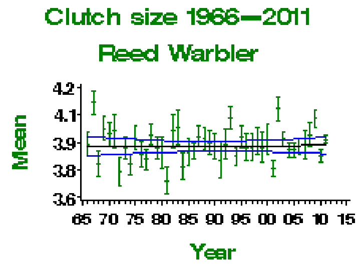


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

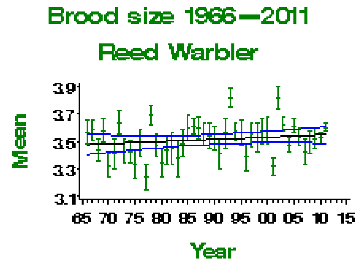
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	135	Linear increase	2.34 fledglings	2.83 fledglings	21.2%		
Clutch size	42	1968-2010	139	None					
Brood size	42	1968-2010	159	None					
Nest failure rate at egg stage	42	1968-2010	173	Linear decline	1.66% nests/day	1.33% nests/day	-19.9%		
Nest failure rate at chick stage	42	1968-2010	135	Linear decline	2.01% nests/day	0.60% nests/day	-70.1%		
Laying date	42	1968-2010	198	Curvilinear	Jun 17	Jun 8	-9 days		
Juvenile to Adult ratio (CES)	26	1984-2010	62	Smoothed trend	67 Index value	100 Index value	50%		
Juvenile to Adult ratio (CES)	25	1985-2010	63	Smoothed trend	69 Index value	100 Index value	44%		
Juvenile to Adult ratio (CES)	10	2000-2010	67	Smoothed trend	93 Index value	100 Index value	8%		
Juvenile to Adult ratio (CES)	5	2005-2010	67	Smoothed trend	94 Index value	100 Index value	6%		

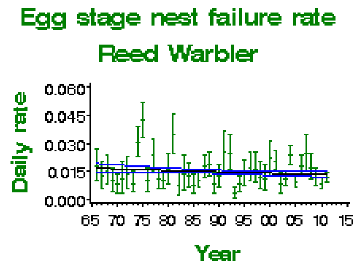
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



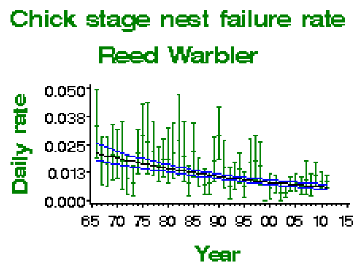
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



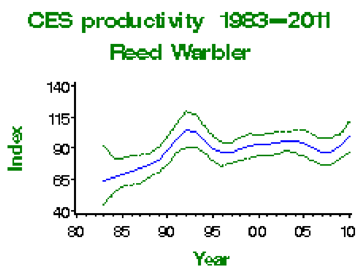
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



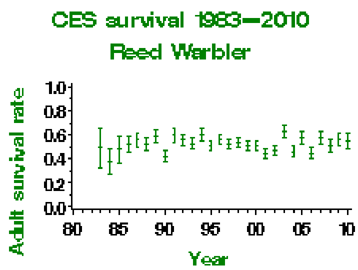
Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Smoothed long-term trend in ratio of juvenile:adult birds caught - green lines indicate 85% confidence limits



Proportion of adult birds surviving to following year - green bars represent 95% confidence limits

Causes of change

Breeding performance has increased, with some suggestion that this may be related to warming climate or improved habitat management, although the evidence for this is sparse.

Change factor	Primary driver	Secondary driver
Demographic	Increased breeding success	
Ecological	Climate change	

Further information on causes of change

There is some evidence to suggest that this species has benefited from warmer climates. Reed Warblers have shown a trend towards earlier laying (see above), which can be partly explained by recent climate change (Crick & Sparks 1999, Halupka et al. 2008). Halupka et al. (2008) analysed changes in breeding parameters of Polish Reed Warblers, studied during 12 breeding seasons between 1970 and 2006, and found that the onset of breeding advanced with warming temperatures, although the end of breeding did not change, thus resulting in an extension of the breeding season. The lengthening of the laying period by about three weeks meant that more birds were able to rear second broods. Furthermore, mean temperature during May-July correlated negatively with the proportion of nests that failed and there was some evidence of a positive relationship with the number of fledglings. The data show a linear increase in the numbers of fledglings per breeding attempt, and a small improvement is apparent in CES productivity, although there is no available evidence to suggest that this is related to changing climate. Breeding performance as measured by brood size has also improved slightly.

Both CBC/BBS and WBS/WBBS trends show progressive moderate increases perhaps linked to increasingly sensitive management of small and linear wetland sites. Thaxter et al. (2006) analysed data from two sites and found indirect evidence linking good habitat management to local abundance and survival.

As this species is a migrant it is possible that factors operating outside the breeding season may be responsible for changes in population in the UK. Thaxter et al. (2006) found that, unlike in the Sedge Warbler, rainfall in the Sahel region of West Africa did not account for variation in survival rates over time and did not correlate with variation in adult Reed Warbler abundance in the UK.

Julliard (2004) found that the French Reed Warbler population appears to be strongly regulated and that population growth rate was more influenced by survival rate than by recruitment. There is no evidence from the UK regarding survival rates.

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Nuthatch

Sitta europaea

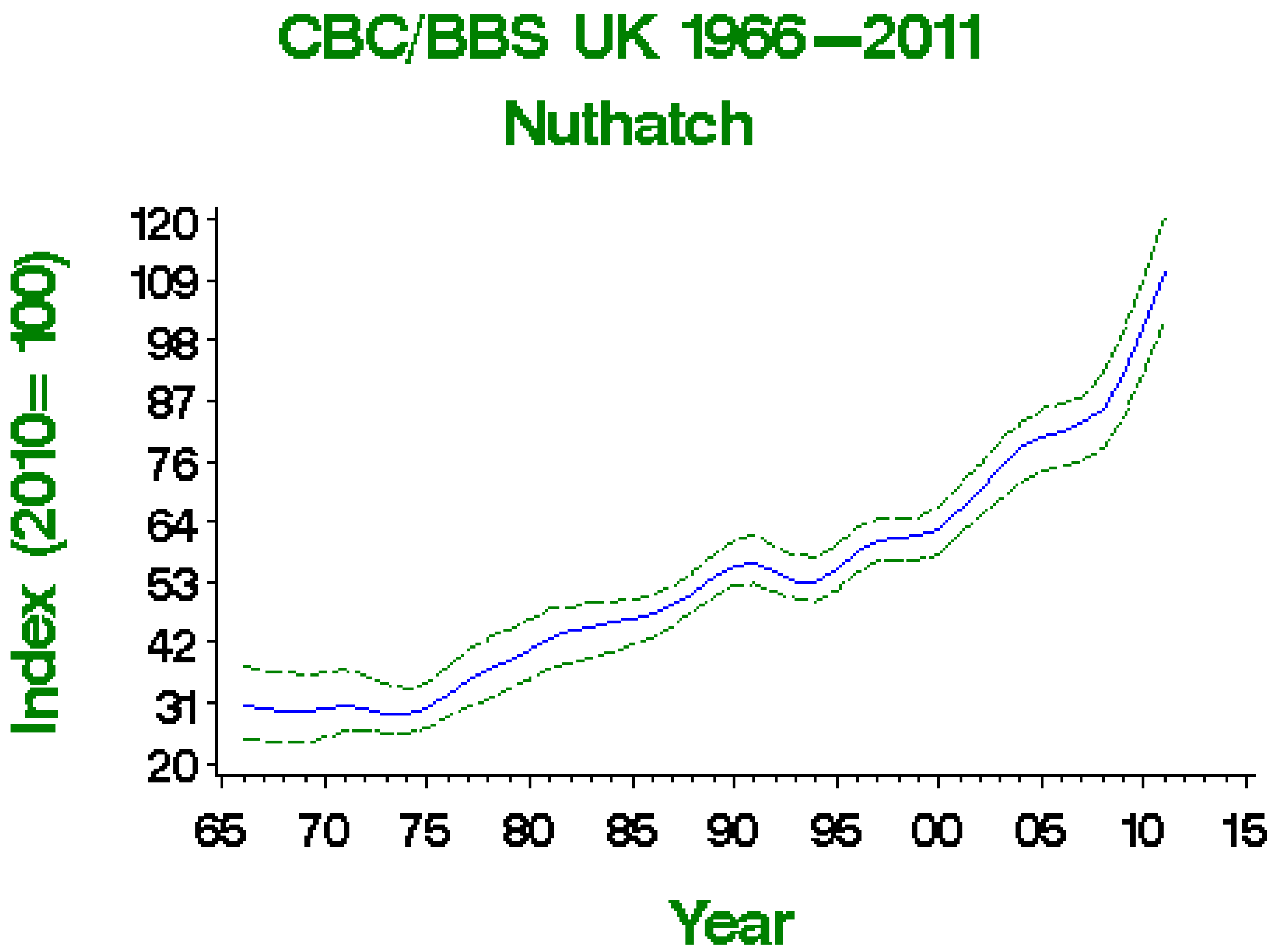
Key facts

Conservation listings:	Europe: no SPEC category (not concentrated in Europe, conservation status favourable) (BiE04) UK: green (BoCC3)
Long-term trend:	UK, England: rapid increase
Population size:	220,000 territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Migrant status:	Resident
Nesting habitat:	Cavity nester
Primary breeding habitat:	Woodland
Secondary breeding habitat:	
Breeding diet:	Animal
Winter diet:	Vegetation

Status summary

Nuthatch abundance in the UK has increased rapidly since the mid 1970s. Despite minor setbacks during the 1990s, there is no indication yet of a halt to the upward trend. This increase has been accompanied by a range expansion into northern England (Gibbons et al. 1993) and southern Scotland. The BBS PECBMS 2012a).



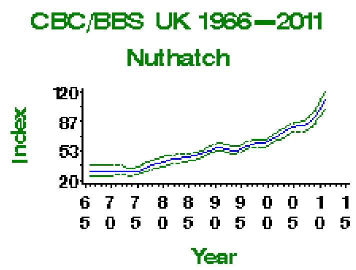
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

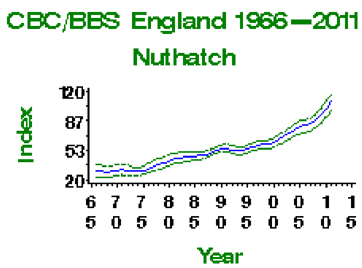
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	215	235	146	360		
	25	1985-2010	330	116	82	161		
	10	2000-2010	546	58	47	73		
	5	2005-2010	633	25	19	35		
CBC/BBS England	43	1967-2010	185	244	148	381		
	25	1985-2010	282	116	78	159		
	10	2000-2010	464	63	51	78		
	5	2005-2010	543	25	19	34		
BBS UK	15	1995-2010	453	80	63	96		
	10	2000-2010	534	56	44	69		
	5	2005-2010	622	26	19	34		
BBS England	15	1995-2010	382	82	64	102		
	10	2000-2010	453	60	49	73		
	5	2005-2010	534	26	21	34		
BBS Wales	15	1995-2010	70	52	16	90		
	10	2000-2010	79	29	7	61		
	5	2005-2010	86	16	0	40		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

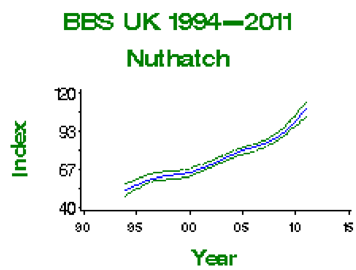
BTO JNCC Joint Nature Conservation Committee rspb The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



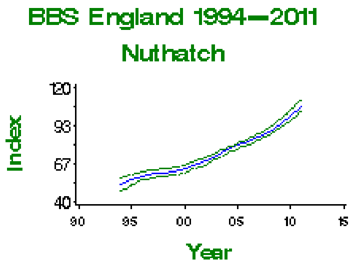
CBC/BBS UK graph



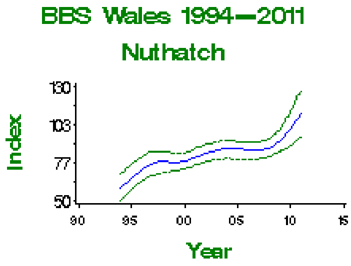
CBC/BBS England graph



BBS UK graph

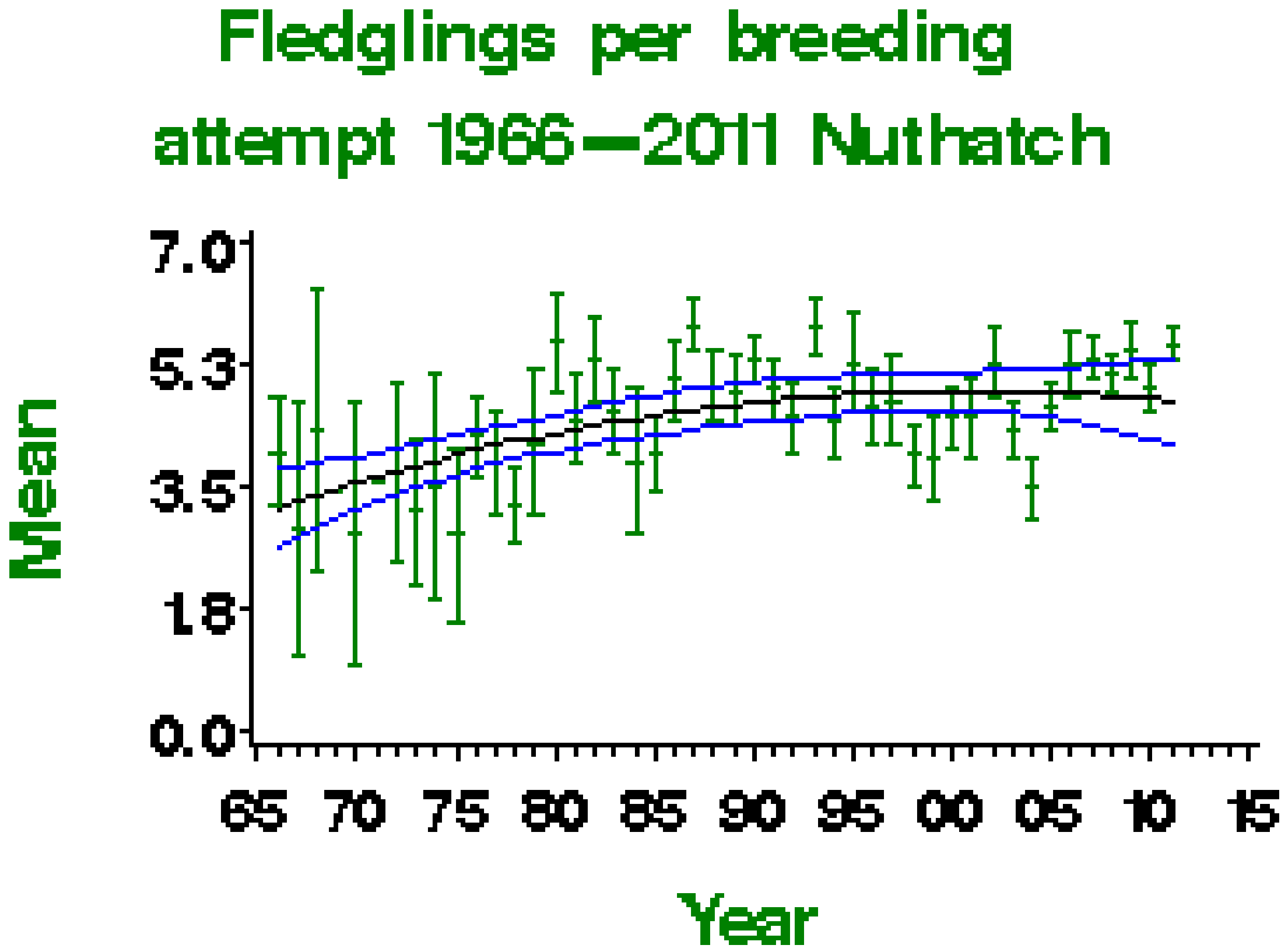


BBS England graph

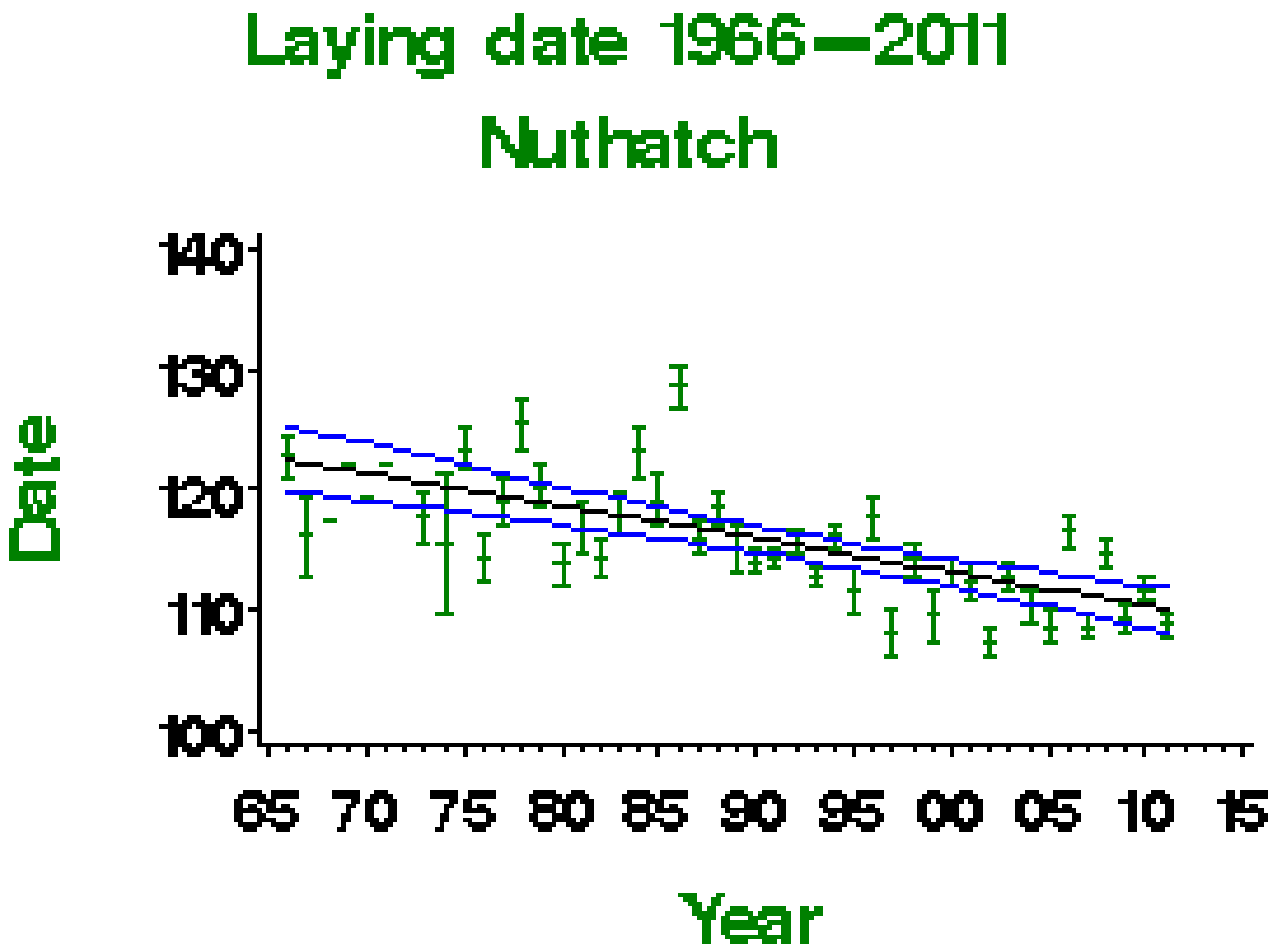


BBS Wales graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend



Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

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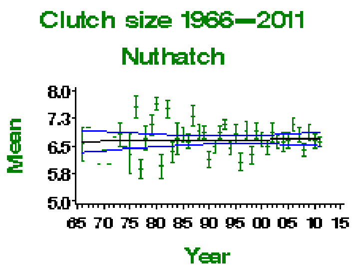
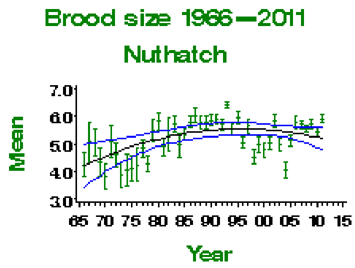
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	51	Curvilinear	3.40 fledglings	4.78 fledglings	40.5%		
Clutch size	42	1968-2010	30	None					Small sample
Brood size	42	1968-2010	73	Curvilinear	4.38 chicks	5.24 chicks	19.7%		
Nest failure rate at egg stage	42	1968-2010	52	Linear decline	0.92% nests/day	0.22% nests/day	-76.1%		
Nest failure rate at chick stage	42	1968-2010	60	Linear decline	0.45% nests/day	0.21% nests/day	-53.3%		
Laying date	42	1968-2010	30	Linear decline	May 2	Apr 20	-12 days		Small sample

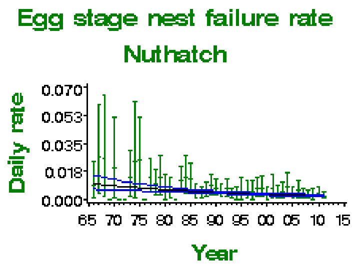
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



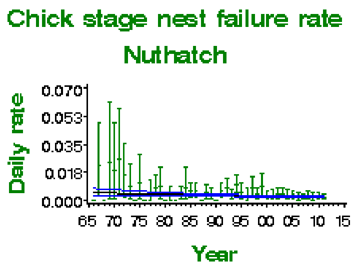
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

Causes of change

The demographic causes of the population increase appear to be an increase in the number of fledglings per breeding attempt, larger brood sizes and a decrease in daily failure rates. However, it is unclear what the ecological drivers of these changes are.

Change factor	Primary driver	Secondary driver
Demographic	Increased breeding success	
Ecological	Unknown	

Further information on causes of change

As shown above, the number of fledglings per breeding attempt has increased. There was also a large increase in brood size up to the 1990s, although this has now stabilised, while daily failure rate has fallen.

There is little evidence relating to Nuthatch population change in the UK. However, studies from Europe provide evidence that mild winters are likely to have helped this species. Kallander (1997) used a long-term data set (1977-91) to provide good evidence that Nuthatches in a Swedish national park had a population size in spring which co-varied positively with winter temperatures and suggest that increases in population size may be associated with increasing mean winter temperature. Nilsson (1982, 1987) also found that mortality was concentrated in winter and that starvation was probably the major cause. However, a long-term study in Poland from 1975 to 1990 found that bird numbers in spring were not significantly correlated with the severity of the preceding winter, though winter survival was higher in the unusually mild winter of 1989/90, which had a rich supply of hornbeam seeds (Wesolowski & Stawarczyk 1991). It is not possible to say whether such factors have also operated in the UK, as the climate here is considerably different.

Several studies have also reported a link between population size and the size of food availability in the autumn. A study of two Nuthatch populations in Sweden provided good evidence that autumn population size was correlated with the size of the hazelnut crop, suggesting food supplies play a role, although beechmast size was not correlated with overwinter survival and nor was autumn population size correlated with the population density in spring (Enoksson & Nilsson 1983, Enoksson 1990). In the studies by Nilsson mentioned above, the main density-dependent factor, recruitment of young of the year to the autumn population, was positively related to the current beechmast supply and negatively to the density of adults (Nilsson 1982, 1987). A long-term study in Poland from 1975 to 1990 also found that Nuthatch numbers seemed to be influenced by autumn seed supply and also availability of caterpillars in the preceding spring (Wesolowski & Stawarczyk 1991). Another continental study in Europe found that local survival in autumn was higher in beechmast years for juveniles, but not for adults and that local winter survival was not higher in years with than in years without beechmast (Matthysen 1989). Thus there is some evidence that increases in population size are linked to food supplies, but again, this has not been directly tested for UK birds.

Although there is no direct evidence available, Nuthatches are known to favour dead wood, and so it is possible that they may have benefited from the increase in dead wood in the UK (Amar et al. 2010).

In Belgium, competition for nest sites with the non-native, invasive Ring-necked Parakeet was found to be detrimental to Nuthatches (Strubbe & Matthysen 2009). However, there is evidence showing that this is not a problem in the UK at present (Newson et al. 2011).

The reasons for the decline in Nuthatches in Wales are unknown.

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Treecreeper

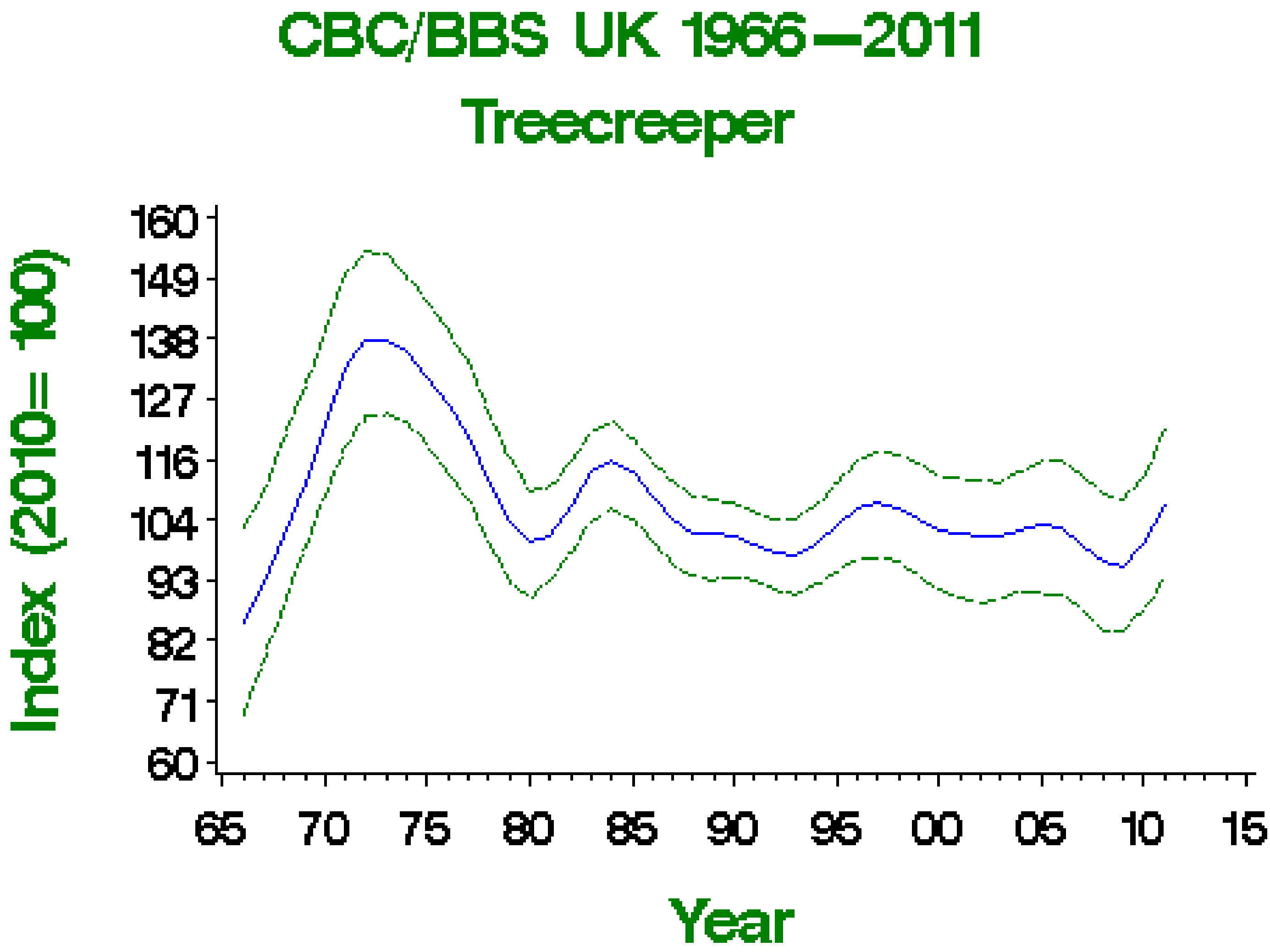
Certhia familiaris

Key facts

Conservation listings:	Europe: no SPEC category (not concentrated in Europe, conservation status favourable) (BiE04) UK: green (species level); amber (race britannica, >20% of European breeders) (BoCC3)
Long-term trend:	UK, England: fluctuating, with no long-term trend
Population size:	200,000 territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Status summary

The UK Treecreeper population peaked in the mid 1970s, but has been roughly stable since about 1980. Intensive study has shown that Treecreeper numbers and survival rates are reduced by wet winter weather (Peach et al. 1995b). The influence of cold weather is also evident in the low start to the index, following the severe winter of 1962/63, and the trough around 1980. Census data suggest a minor decline has occurred since the early 1980s, but CES adult captures have increased for much of this period. Productivity, calculated using CES data, shows fluctuations around a long-term shallow increase but a sharp downturn in recent years. There has been a significant fall in nest failure rates at the egg stage (18 days, comprising 14 days incubation and 4 days laying). The trend towards earlier laying can be partly explained by recent climate change (Crick & Sparks 1999). There has been little long-term change across Europe since 1980, but moderate decrease since 1990 (PECBMS 2012a).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

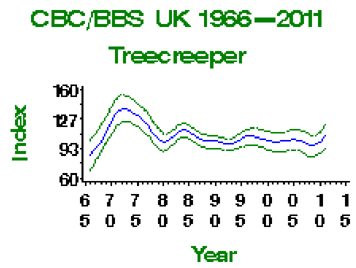
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	200	8	-24	41		
	25	1985-2010	274	-12	-28	4		
	10	2000-2010	372	-3	-14	13		
	5	2005-2010	409	-4	-11	5		

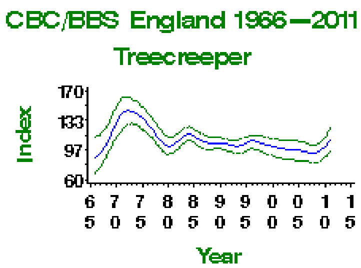
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	43	1967-2010	156	7	-22	41		
	25	1985-2010	210	-12	-28	4		
	10	2000-2010	277	0	-9	11		
	5	2005-2010	307	4	-5	16		
CES adults	26	1984-2010	37	31	-15	94		
	25	1985-2010	38	70	22	159		
	10	2000-2010	41	13	-6	38		
	5	2005-2010	37	-9	-24	11		
CES juveniles	26	1984-2010	61	70	17	152		
	25	1985-2010	62	97	34	183		
	10	2000-2010	69	31	12	62		
	5	2005-2010	62	18	-3	42		
BBS UK	15	1995-2010	335	-1	-14	11		
	10	2000-2010	365	-4	-19	12		
	5	2005-2010	409	-2	-8	7		
BBS England	15	1995-2010	246	-6	-17	9		
	10	2000-2010	266	-2	-11	8		
	5	2005-2010	299	4	-4	15		
BBS Scotland	15	1995-2010	37	1	-32	34		
	10	2000-2010	40	19	-24	67		
	5	2005-2010	51	-8	-27	10		
BBS Wales	15	1995-2010	40	6	-29	52		
	10	2000-2010	43	-32	-51	-6	>25	
	5	2005-2010	42	-9	-28	16		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

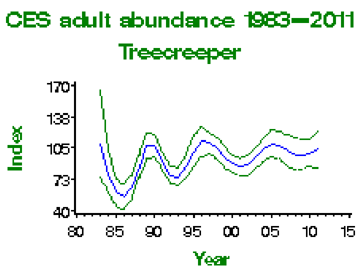
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



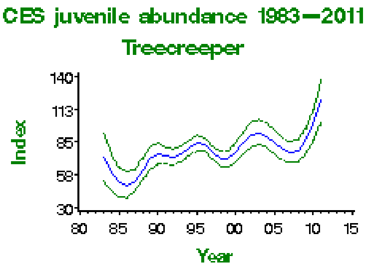
CBC/BBS UK graph



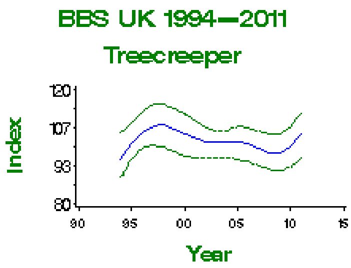
CBC/BBS England graph



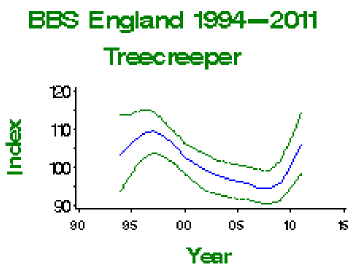
CES adults graph



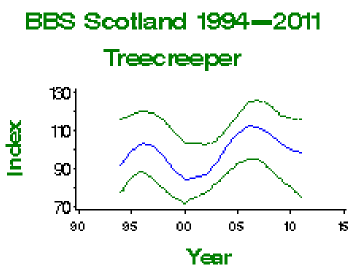
CES juveniles graph



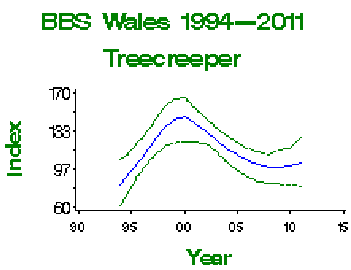
BBS UK graph



BBS England graph

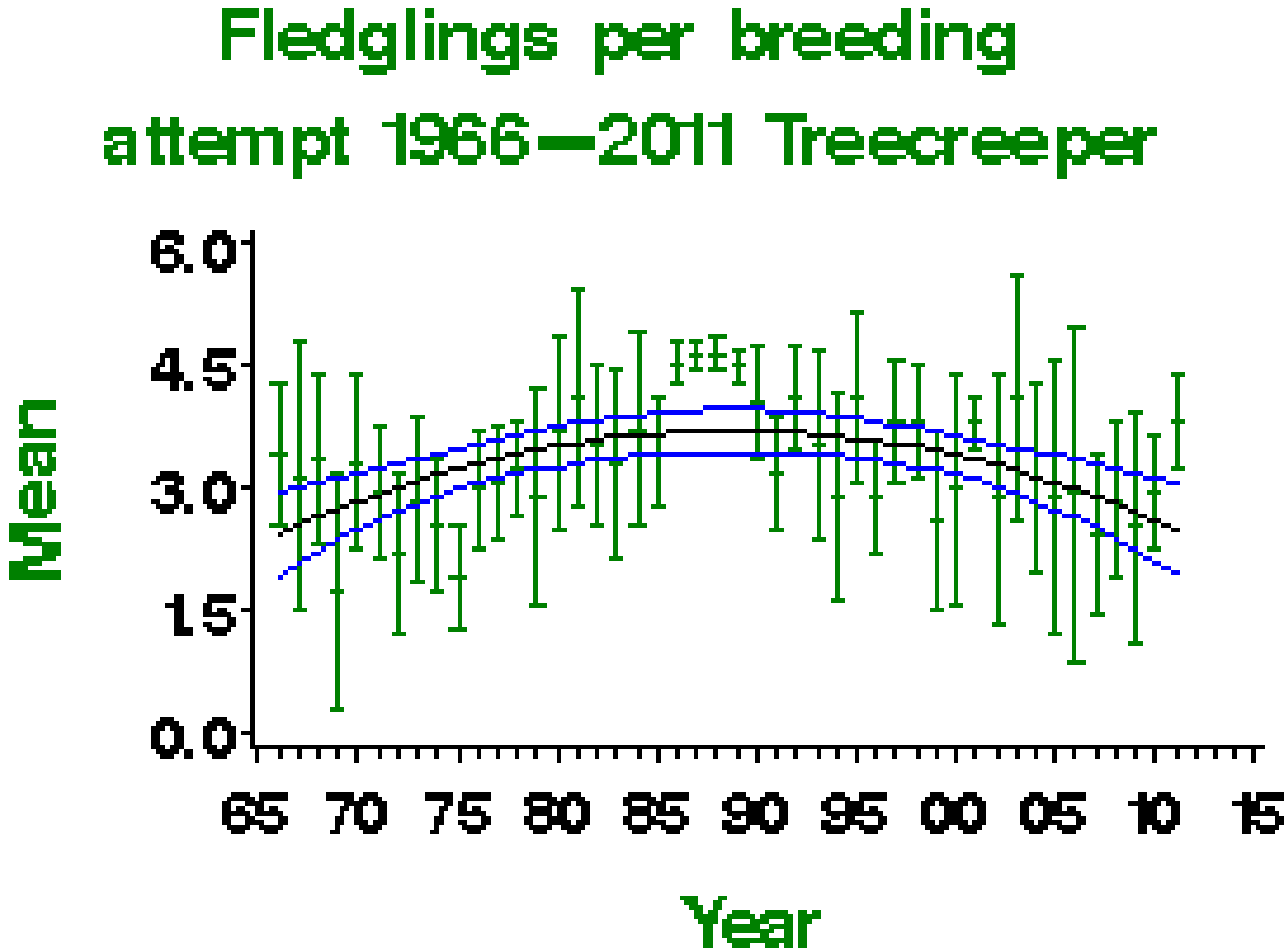


BBS Scotland graph

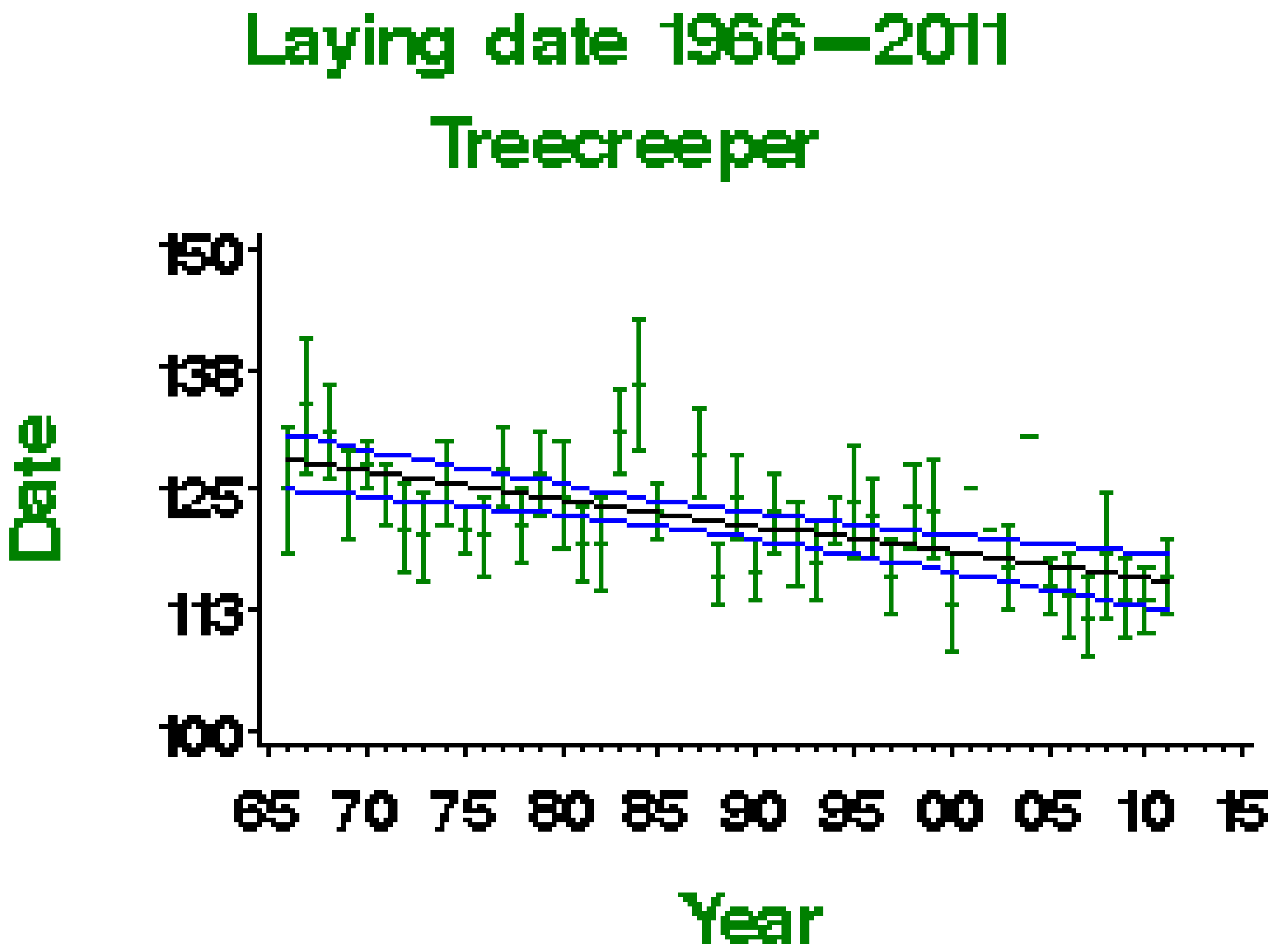


BBS Wales graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

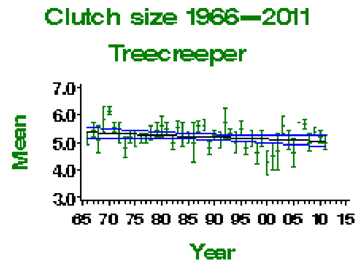


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

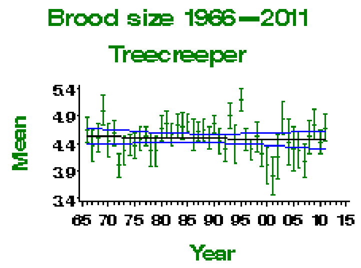
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	20	Curvilinear	2.65 fledglings	2.64 fledglings	-0.6%		
Clutch size	42	1968-2010	13	None					Small sample
Brood size	42	1968-2010	28	None					Small sample
Nest failure rate at egg stage	42	1968-2010	22	Curvilinear	2.34% nests/day	1.46% nests/day	-37.6%		Small sample
Nest failure rate at chick stage	42	1968-2010	22	Curvilinear	1.50% nests/day	1.54% nests/day	2.7%		Small sample
Laying date	42	1968-2010	13	Linear decline	May 7	Apr 26	-11 days		Small sample
Juvenile to Adult ratio (CES)	26	1984-2010	68	Smoothed trend	77 Index value	100 Index value	29%		
Juvenile to Adult ratio (CES)	25	1985-2010	69	Smoothed trend	94 Index value	100 Index value	6%		
Juvenile to Adult ratio (CES)	10	2000-2010	77	Smoothed trend	89 Index value	100 Index value	13%		
Juvenile to Adult ratio (CES)	5	2005-2010	71	Smoothed trend	72 Index value	100 Index value	40%		

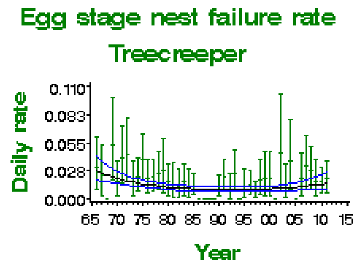
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



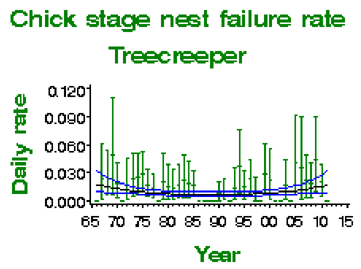
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



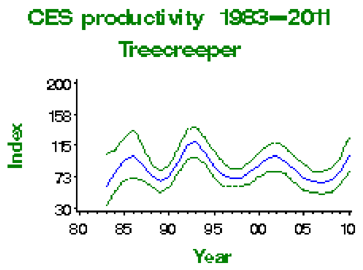
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Smoothed long-term trend in ratio of juvenile:adult birds caught - green lines indicate 85% confidence limits

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Wren

Troglodytes troglodytes

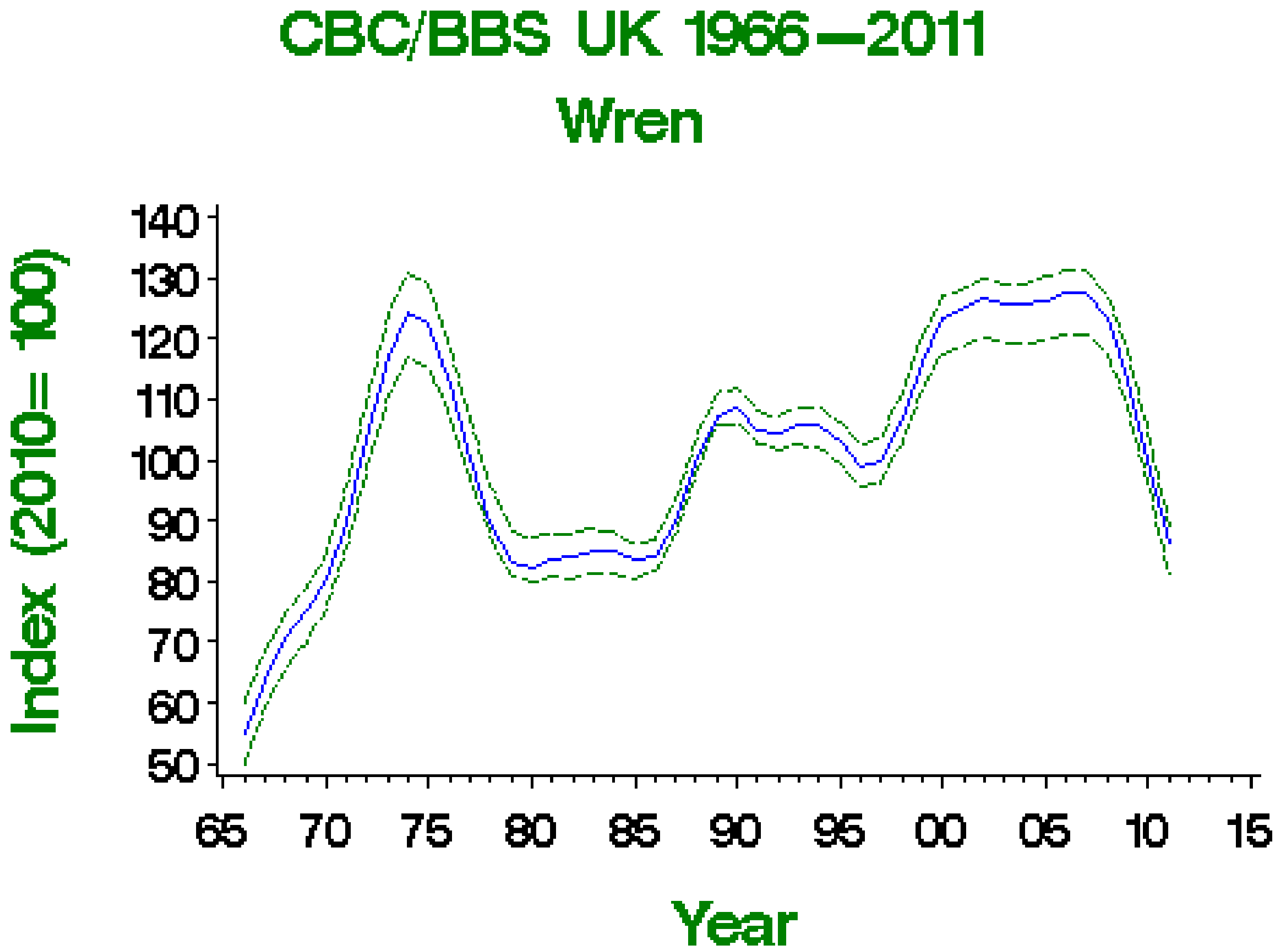
Key facts

Conservation listings:	Europe: no SPEC category (favourable conservation status in Europe, not concentrated in Europe) (BiE04) UK: green (species level); amber (race *indigenus*, >20% of European breeders; races *hebridensis* and *zetlandicus*, >20% of European breeders, European status); red (races *fridariensis* and *hirtensis*, rare breeders of global importance) (BoCC3) UK Biodiversity Action Plan: priority species (Fair Isle & St Kilda races)
Long-term trend:	UK, England: moderate increase
Population size:	8.6 million territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Migrant status:	Resident
Nesting habitat:	Above-ground nester
Primary breeding habitat:	Woodland
Secondary breeding habitat:	
Breeding diet:	Animal
Winter diet:	Animal

Status summary

The Wren's current UK population estimate is the highest for any species. Abundance can vary sharply from year to year, however, although this is not evident from the smoothed trends presented here. Wren numbers in the UK were greatly depleted by the cold winter of 1962/63 (Marchant et al. 1990). Following a rapid recovery up to the mid 1970s, abundance fell again in response to a further series of cold winters only to return to its previous high level. The BBS PECBMS 2012a).



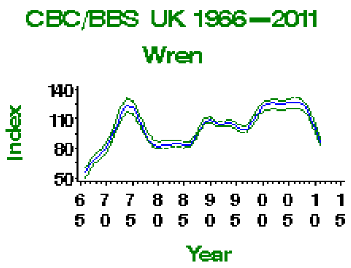
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

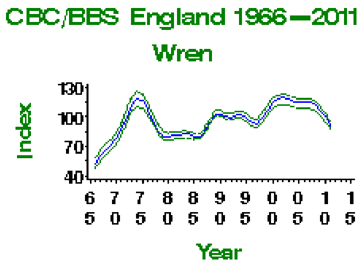
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	1040	57	40	75		
	25	1985-2010	1627	20	12	29		
	10	2000-2010	2705	-19	-20	-16		
	5	2005-2010	3056	-21	-21	-18		
CBC/BBS England	43	1967-2010	827	65	41	88		
	25	1985-2010	1282	25	15	34		
	10	2000-2010	2116	-13	-15	-11		
	5	2005-2010	2409	-13	-14	-11		
CES adults	26	1984-2010	99	15	-1	34		
	25	1985-2010	101	26	9	46		
	10	2000-2010	110	-24	-32	-17		
	5	2005-2010	106	-23	-29	-18		
CES juveniles	26	1984-2010	98	23	-9	60		
	25	1985-2010	101	27	-2	66		
	10	2000-2010	109	-14	-24	-4		
	5	2005-2010	105	-13	-24	-1		
BBS UK	15	1995-2010	2400	-2	-5	3		
	10	2000-2010	2689	-17	-18	-14		
	5	2005-2010	3056	-21	-22	-18		
BBS England	15	1995-2010	1842	-1	-5	2		
	10	2000-2010	2051	-11	-13	-9		
	5	2005-2010	2324	-14	-15	-12		
BBS Scotland	15	1995-2010	225	-1	-5	17		
	10	2000-2010	245	-32	-34	-20	>25	
	5	2005-2010	287	-42	-42	-32	>25	
BBS Wales	15	1995-2010	195	-11	-20	-4		
	10	2000-2010	221	-22	-28	-15		
	5	2005-2010	230	-25	-28	-19		
BBS N.Ireland	15	1995-2010	91	22	1	56		
	10	2000-2010	105	-26	-29	-12	>25	
	5	2005-2010	113	-28	-28	-17	>25	

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



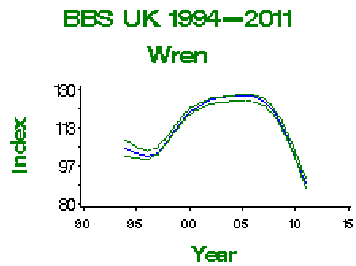
CBC/BBS UK graph



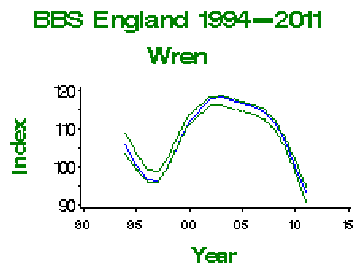
CBC/BBS England graph

CES adults graph

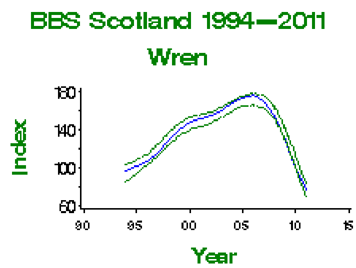
CES juveniles graph



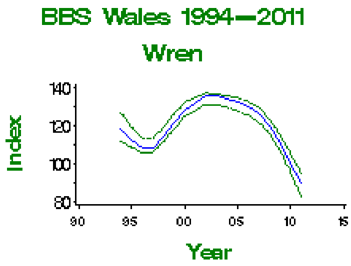
BBS UK graph



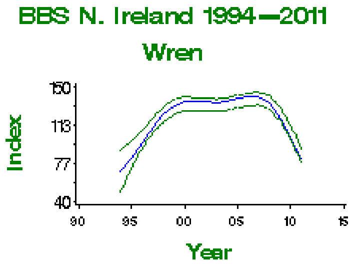
BBS England graph



BBS Scotland graph

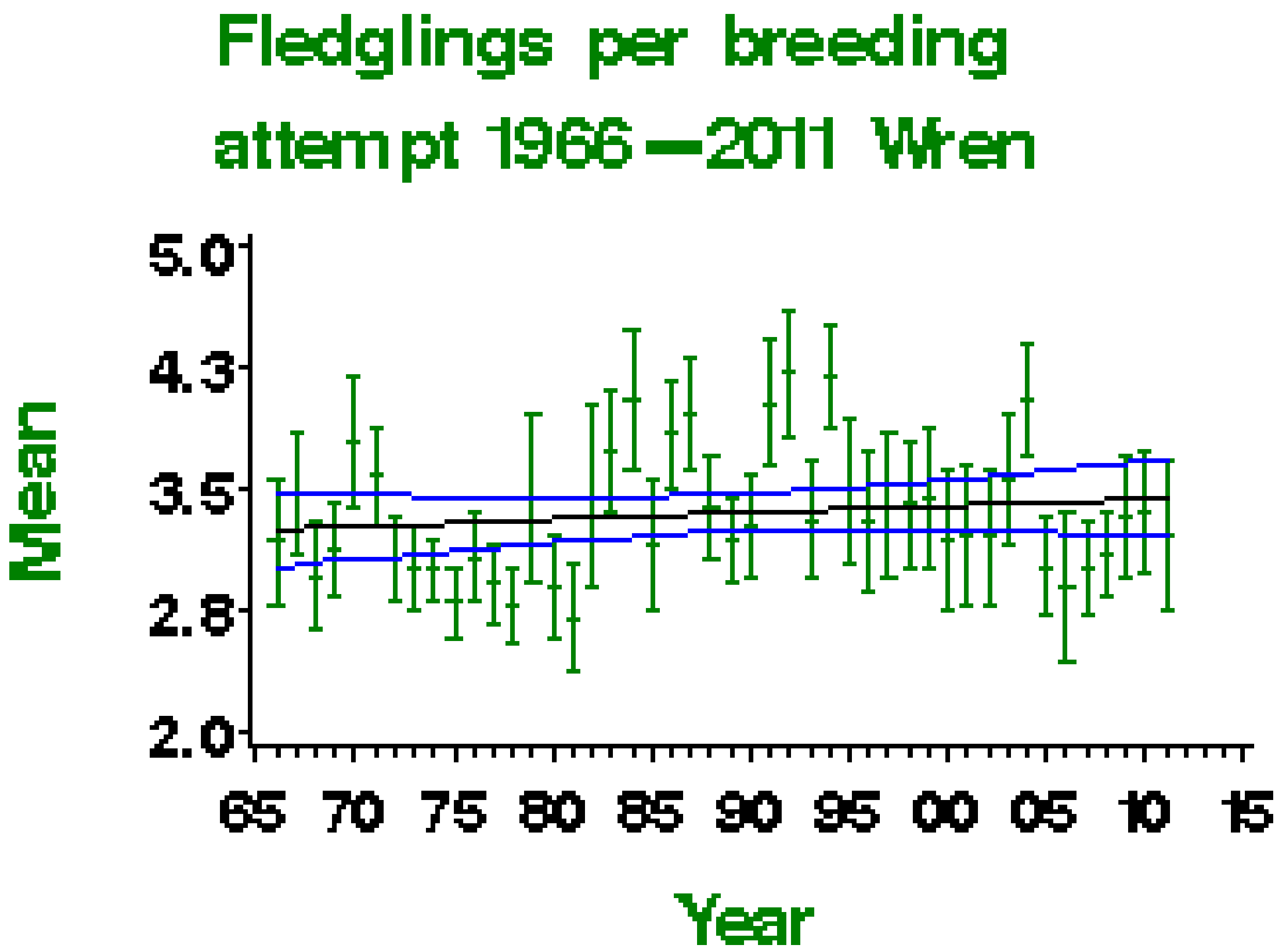


BBS Wales graph

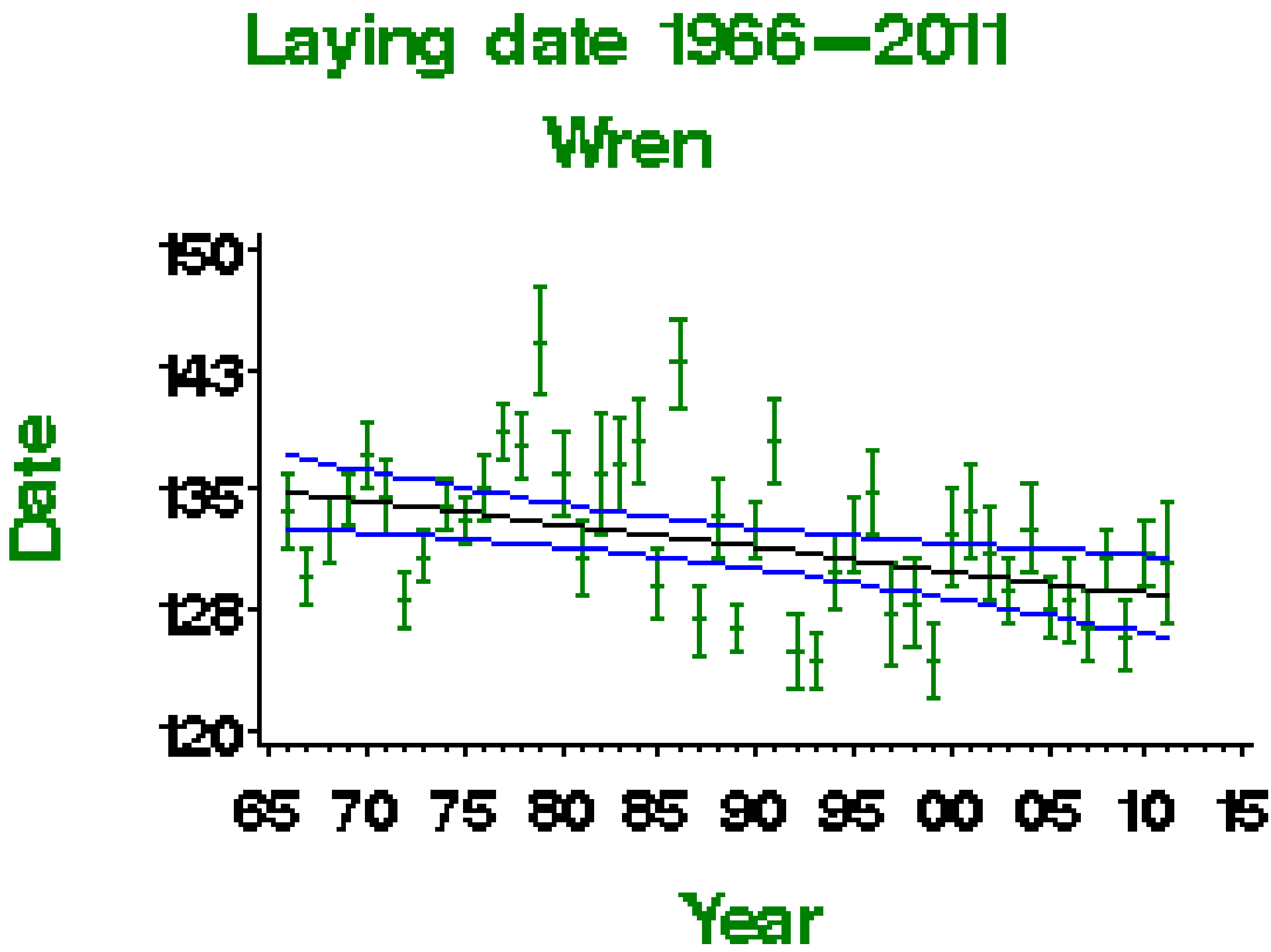


BBS N.Ireland graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

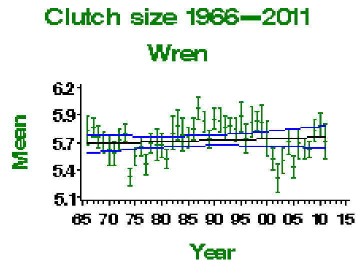


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

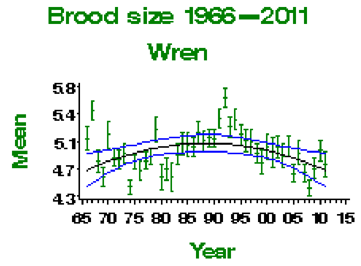
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	90	None					
Clutch size	42	1968-2010	94	None					
Brood size	42	1968-2010	99	Curvilinear	4.72 chicks	4.69 chicks	-0.7%		
Nest failure rate at egg stage	42	1968-2010	138	Linear decline	1.86% nests/day	1.23% nests/day	-33.9%		
Nest failure rate at chick stage	42	1968-2010	96	None					
Laying date	42	1968-2010	87	Linear decline	May 15	May 8	-6 days		
Juvenile to Adult ratio (CES)	26	1984-2010	103	Smoothed trend	91 Index value	100 Index value	10%		
Juvenile to Adult ratio (CES)	25	1985-2010	105	Smoothed trend	96 Index value	100 Index value	4%		
Juvenile to Adult ratio (CES)	10	2000-2010	113	Smoothed trend	90 Index value	100 Index value	11%		
Juvenile to Adult ratio (CES)	5	2005-2010	109	Smoothed trend	88 Index value	100 Index value	14%		

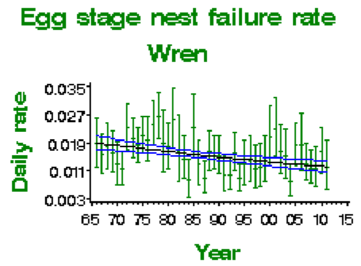
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



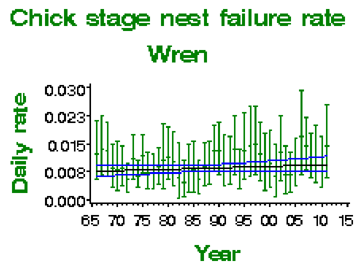
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



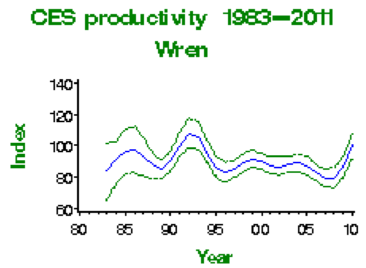
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



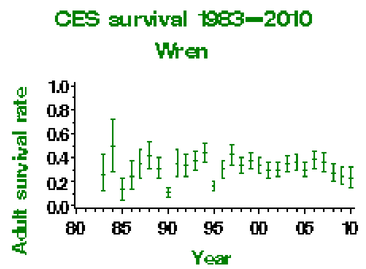
Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Smoothed long-term trend in ratio of juvenile:adult birds caught - green lines indicate 85% confidence limits



Proportion of adult birds surviving to following year - green bars represent 95% confidence limits

Causes of change

There is good evidence that mortality rates are severely affected by cold winter weather. Thus, a warming climate may have benefited this species, although there is only circumstantial evidence for this.

Change factor	Primary driver	Secondary driver
Demographic	Increased survival	
Ecological	Climate change	

Further information on causes of change

There has been a reduction in the failure rate of nests at the egg stage but there have been few other directional changes in demographic parameters presented here (see above), perhaps reflecting the strong influence of annual climatic variation on this species overriding any more subtle long-term trends.

There is good evidence that annual numbers are influenced by mortality rates and that mortality may be very high in severe winters (Peach et al. 1995). Wren survival rates were negatively correlated with the number of snow days in winter (Peach et al. 1995). Robinson et al. (2007b) showed that survival is related to the strength of the North Atlantic Oscillation, an ocean-scale weather pattern that has a strong influence on UK weather. First-year survival was more influenced by weather than that of adult birds, although adult survival was also affected. This suggests that a warming climate may benefit this species.

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Starling

Sturnus vulgaris

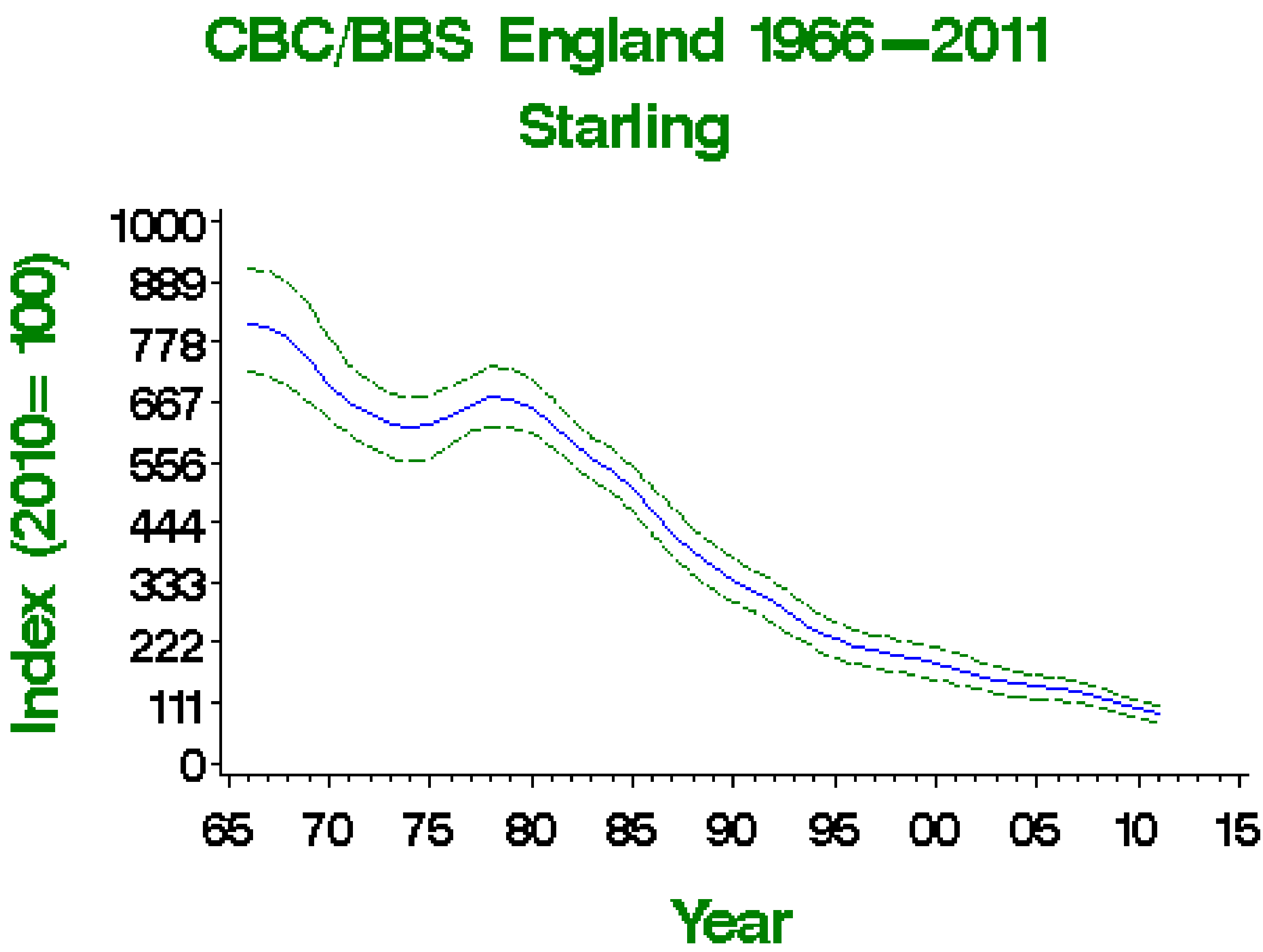
Key facts

Conservation listings:	Europe: SPEC category 3 (declining) (BiE04) UK: red (species level, race *vulgaris*); amber (race *zetlandicus*, >20% of European breeders) (BoCC3) UK Biodiversity Action Plan: priority species
Long-term trend:	England: rapid decline
Population size:	1,900,000 (1,700,000-2,200,000) pairs in 2009 (APEP13: distance sampling estimate for 2006 (Newson et al. 2008) updated using BBS trend)

Migrant status:	Resident
Nesting habitat:	Cavity nester
Primary breeding habitat:	Farmland
Secondary breeding habitat:	
Breeding diet:	Animal
Winter diet:	Vegetation

Status summary

The abundance of breeding Starlings in the UK has fallen rapidly, particularly since the early 1980s, and especially in woodland (Robinson et al. 2002, 2005a) and continues to be strongly downward. The BBS BirdLife International 2004). Overall, there has been widespread moderate decrease across Europe since 1980 (PECBMS 2012a).



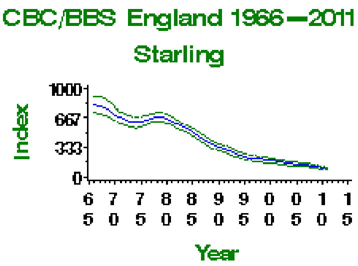
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

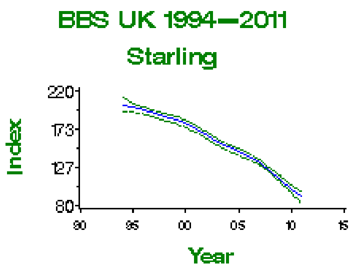
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	43	1967-2010	607	-88	-91	-84	>50	
	25	1985-2010	958	-80	-84	-77	>50	
	10	2000-2010	1534	-46	-49	-42	>25	
	5	2005-2010	1684	-30	-33	-26	>25	
BBS UK	15	1995-2010	1741	-50	-53	-45	>25	
	10	2000-2010	1853	-44	-48	-40	>25	
	5	2005-2010	2018	-31	-36	-26	>25	
BBS England	15	1995-2010	1427	-55	-58	-51	>50	
	10	2000-2010	1510	-45	-49	-42	>25	
	5	2005-2010	1653	-30	-33	-25	>25	
BBS Scotland	15	1995-2010	145	-37	-50	-23	>25	
	10	2000-2010	155	-43	-51	-29	>25	
	5	2005-2010	171	-35	-47	-20	>25	
BBS Wales	15	1995-2010	81	-67	-76	-55	>50	
	10	2000-2010	84	-51	-60	-43	>50	
	5	2005-2010	81	-37	-49	-27	>25	
BBS N.Ireland	15	1995-2010	78	24	-4	60		
	10	2000-2010	92	-38	-51	-25	>25	
	5	2005-2010	99	-29	-46	-10	>25	

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

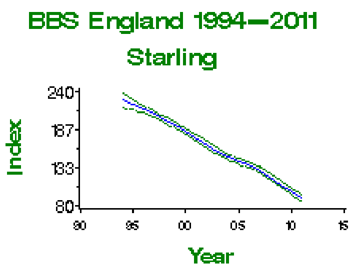
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



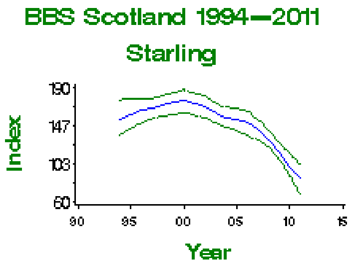
CBC/BBS England graph



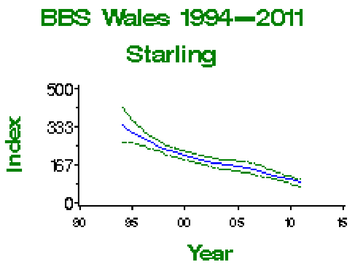
BBS UK graph



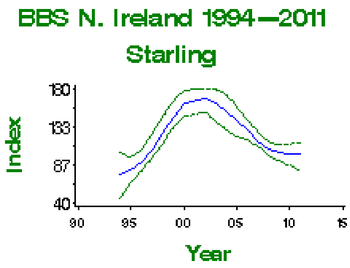
BBS England graph



BBS Scotland graph

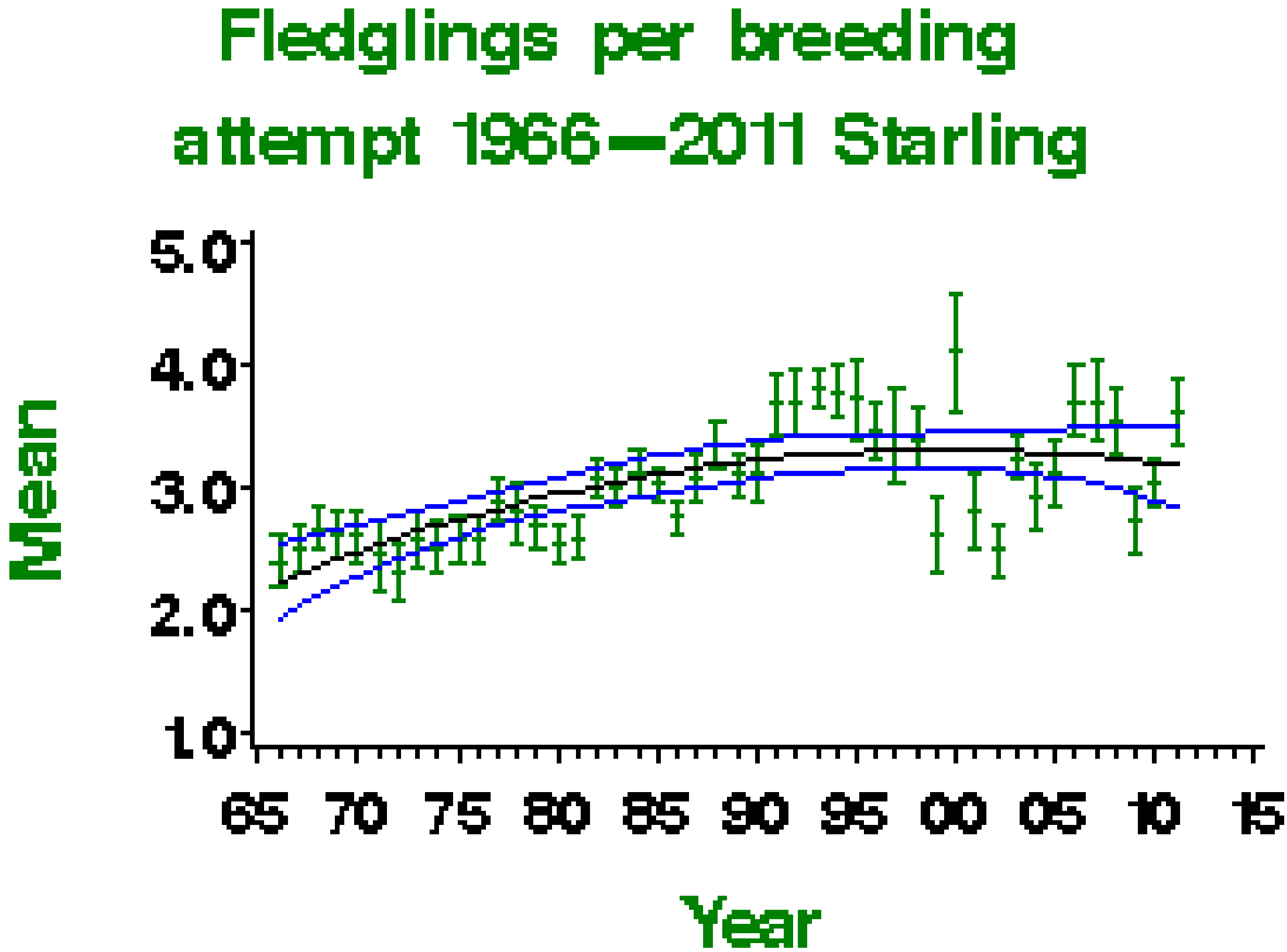


BBS Wales graph

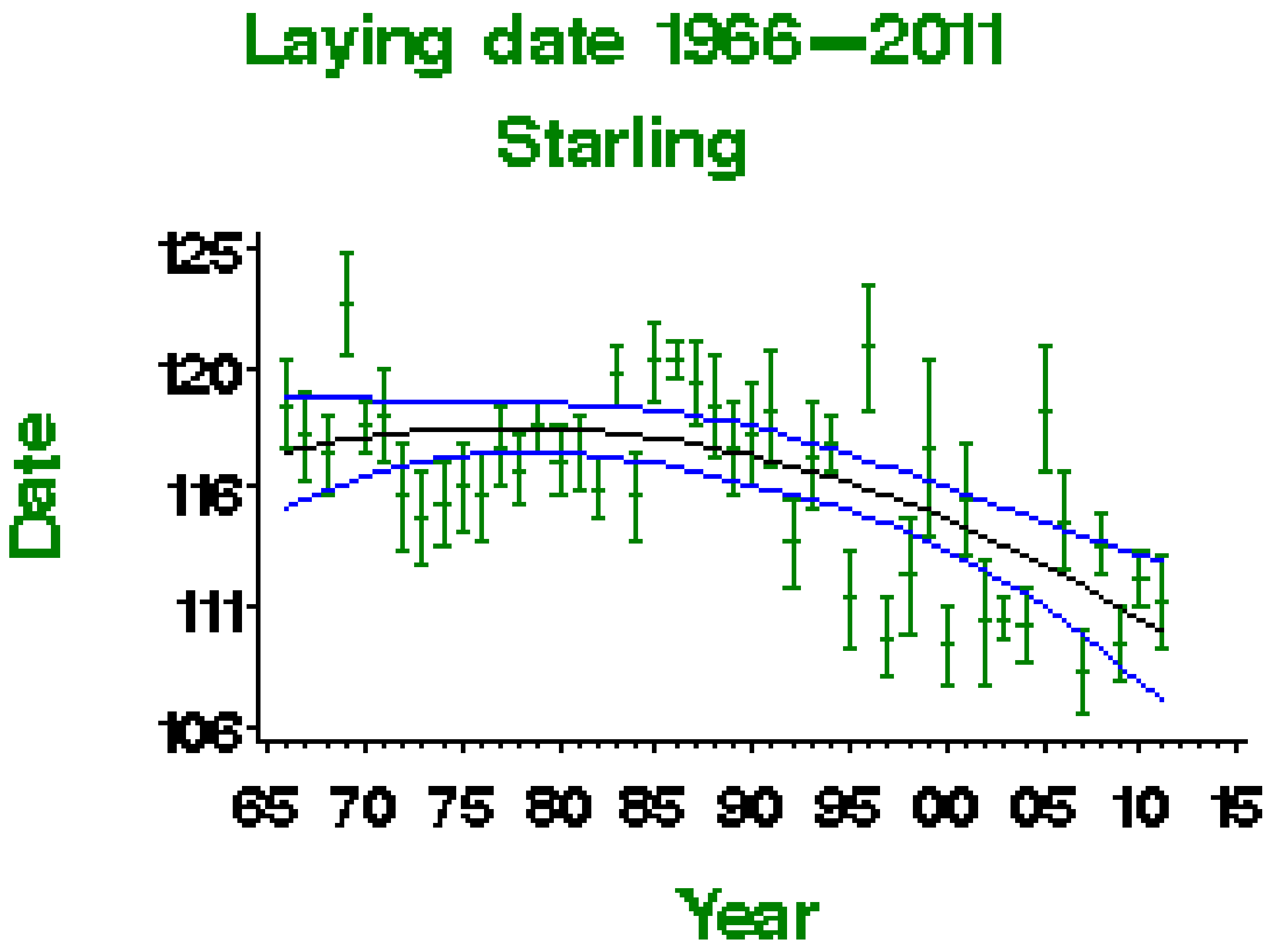


BBS N.Ireland graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend



Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

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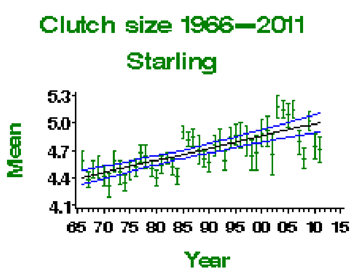
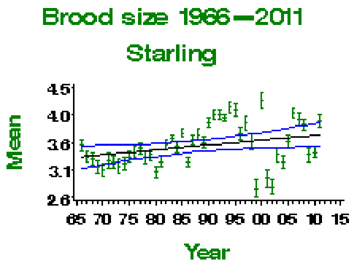
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	114	Curvilinear	2.38 fledglings	3.22 fledglings	35.6%		
Clutch size	42	1968-2010	75	Linear increase	4.43 eggs	4.99 eggs	12.5%		
Brood size	42	1968-2010	213	Linear increase	3.32 chicks	3.68 chicks	10.7%		
Nest failure rate at egg stage	42	1968-2010	120	Linear decline	1.12% nests/day	0.23% nests/day	-79.5%		
Nest failure rate at chick stage	42	1968-2010	134	Linear decline	0.58% nests/day	0.20% nests/day	-65.5%		
Laying date	42	1968-2010	84	Curvilinear	Apr 27	Apr 20	-7 days		

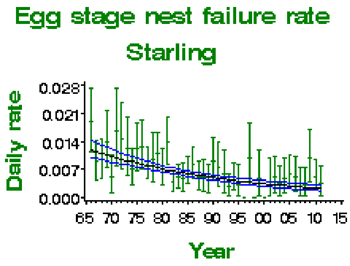
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



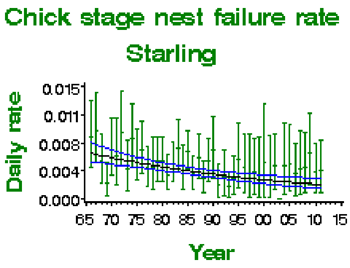
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

Causes of change

There is good evidence that changes in first-year overwinter survival rates best account for observed population change. Although direct evidence explaining the ecological drivers behind this is lacking, changes in the management of pastoral farmland are thought to be largely responsible.

Change factor	Primary driver	Secondary driver
Demographic	Decreased juvenile survival	
Ecological	Unknown	

Further information on causes of change

As the population has dropped, the numbers of fledglings per breeding attempt has increased markedly (see above); clutches are now larger, and rates of nest loss at the egg and chick stage have fallen. These improvements in breeding performance suggest that decreasing survival rates are likely to be responsible for the decline. Evidence for this is provided by Freeman et al. (2007b), who conducted a population modelling exercise and found that changes in first-year overwinter survival rates could best account for observed population change, and were sufficient, on their own, to explain the broad pattern of decline. The decline in survival rates nationwide coincided with the major period of population decline. MacLeod et al. (2008) also provide evidence linking Starling declines to the non-breeding-season environmental conditions, suggesting that the species' population status is dependent on interactive or synergistic effects of food availability and predation.

There is little direct evidence from studies analysing the ecological drivers of the declines. However, changes in pastoral farming practices are likely to account for at least some of the decline in the wider countryside, probably related to changes in food resources, though these are largely unquantified (Robinson et al. 2005). Loss of permanent pasture, which is the species' preferred feeding habitat, and general intensification of livestock rearing are likely to be having adverse effects on rural populations, but other causes should be sought in urban areas (Robinson et al. 2002, 2005). Whilst the number of cattle has declined, sheep numbers have increased, producing a different sward structure (Chamberlain et al. 2000b, Fuller & Gough 1999) and patterns of stock rearing have changed. These may have reduced foraging opportunities for Starling (Robinson et al. 2002, 2005). Also the use of insecticides on grassland, though low, is targeted partly at tipulids, which may have reduced foraging opportunities further (Vickery et al. 2001). Although there is little published evidence that the density of tipulids has changed over time (Wilson et al. 1999), the area of permanent pasture has declined and the use of insecticides on them has increased. Drainage of grasslands is also thought to have reduced the quality of foraging conditions (Newton 2004). Even after considerable decline among farmland Starlings, tipulids remain important to them for provisioning young (Rhymer et al. 2012).

Further research into urban Starling population dynamics is to be encouraged if we are to understand the causes of decline of this charismatic species more fully.

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Dipper

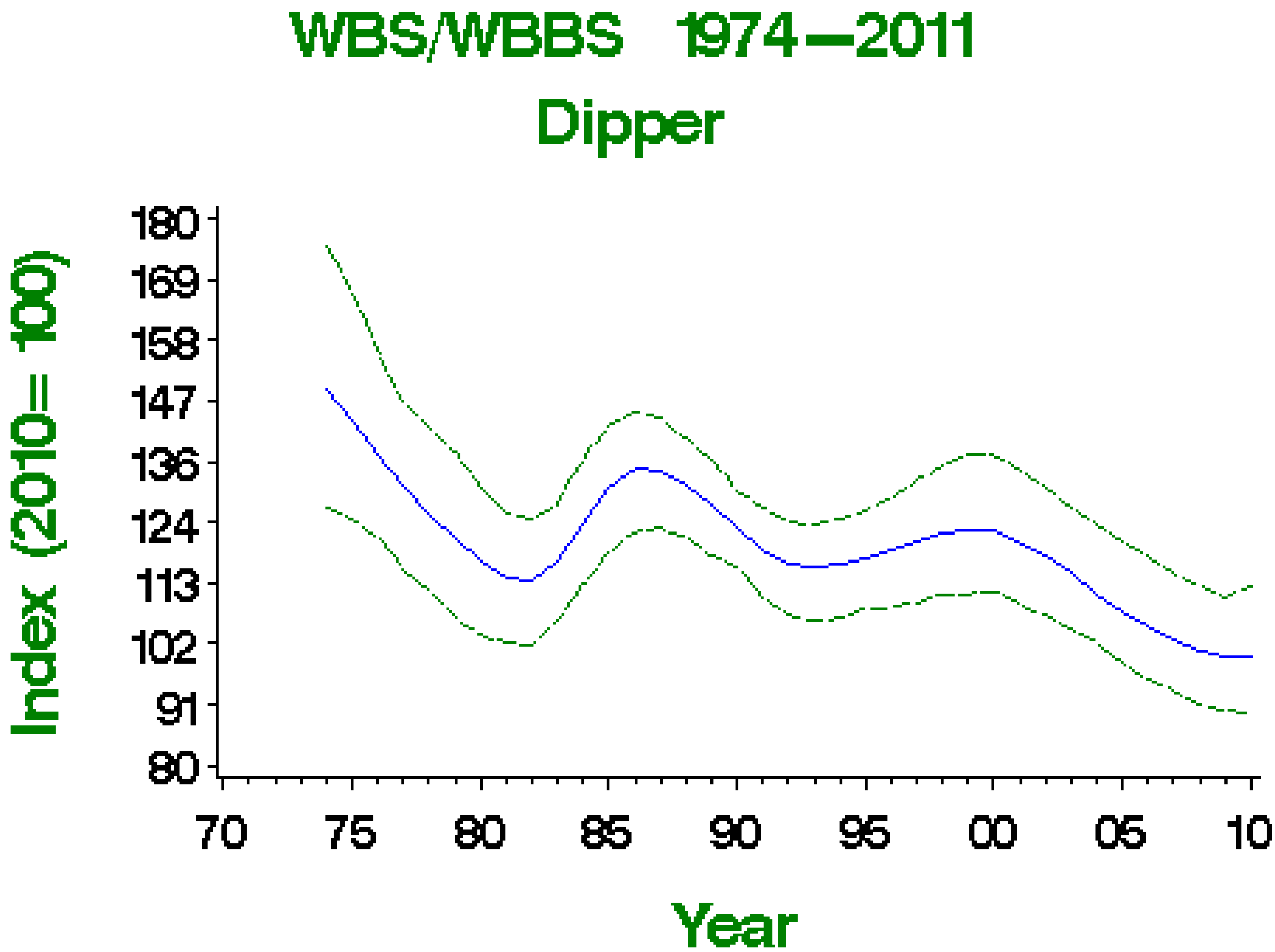
Cinclus cinclus

Key facts

Conservation listings:	Europe: no SPEC category (favourable conservation status in Europe, not concentrated in Europe) (BiE04) UK: green (species level); amber (race *gularis*, >20% of European breeders; race *hibernicus*, >20% of European breeders, European status) (BoCC3)
Long-term trend:	UK waterways: moderate decline
Population size:	6,200-18,700 pairs in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Status summary

The WBS/WBBS shows that Dipper populations have fluctuated over the last thirty years, but with an overall downward trend. The species is unusually sensitive to acidity and other water pollution (Ormerod & Tyler 1989, 1990), with lower breeding densities and productivity on acidic than on more neutral streams (Ormerod et al. 1991, Vickery 1991, 1992). Breeding performance has improved strongly over time, and laying dates have shifted earlier, perhaps because of climate change (Crick & Sparks 1999). Broods now average larger than in the late 1960s and 1970s, and there has been substantial reduction in failure rates of nests at the egg stage, leading to sustained increase in the number of fledglings per breeding attempt. In a river system in southern Norway, climate variables including winter temperature explained 84% of the variation in population level during 1978-2008 (Nilsson et al. 2011).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

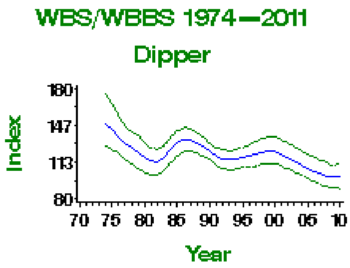
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
WBS/WBBS waterways	35	1975-2010	63	-30	-45	-11	>25	
	25	1985-2010	74	-24	-36	-3		
	10	2000-2010	113	-19	-28	-8		
	5	2005-2010	112	-7	-17	-1		

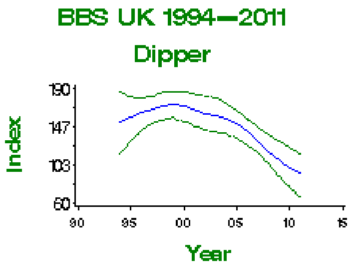
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	15	1995-2010	59	-36	-56	-10	>25	
	10	2000-2010	64	-41	-57	-21	>25	
	5	2005-2010	75	-33	-52	-12	>25	

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB

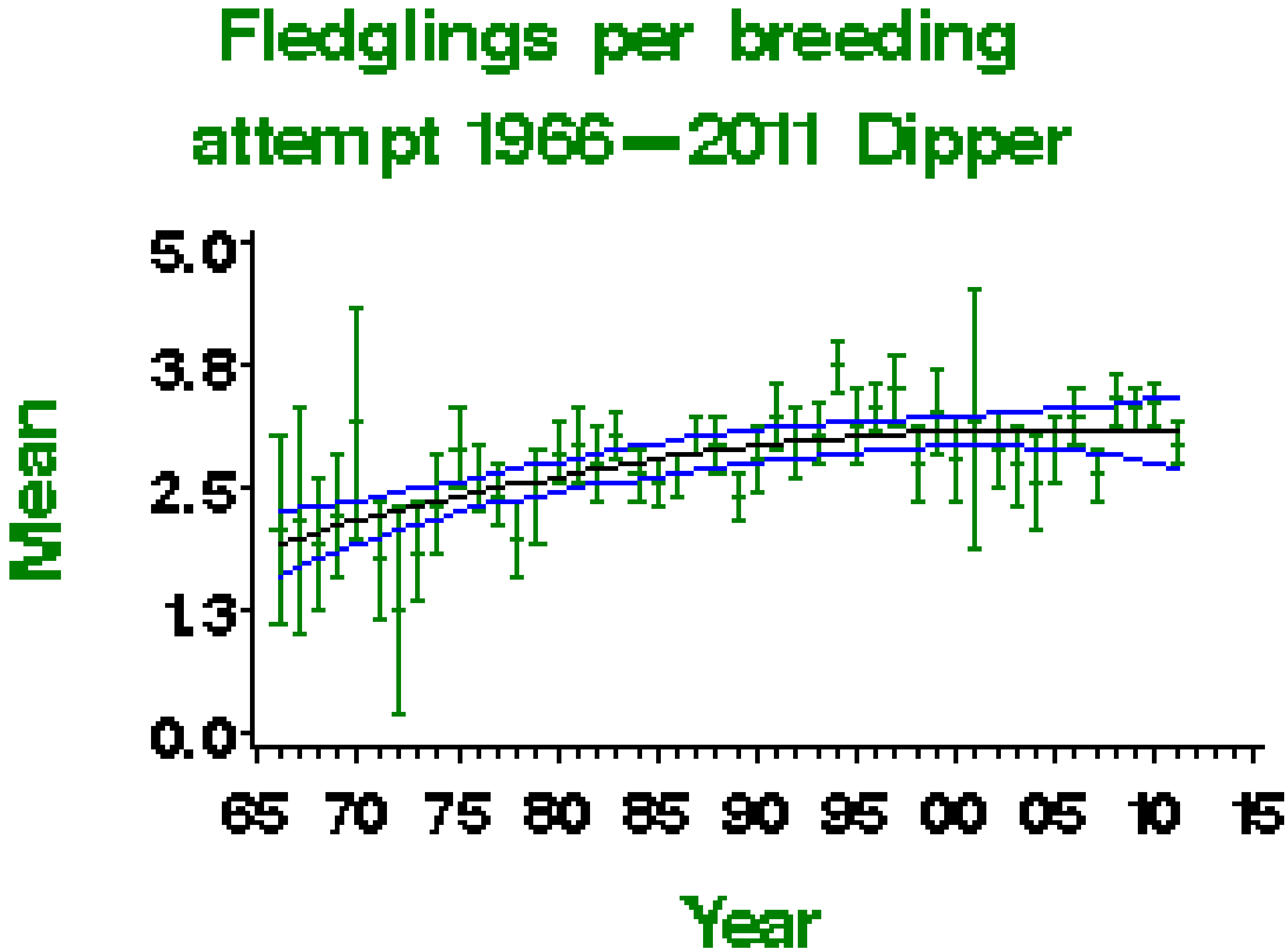


WBS/WBBS waterways graph

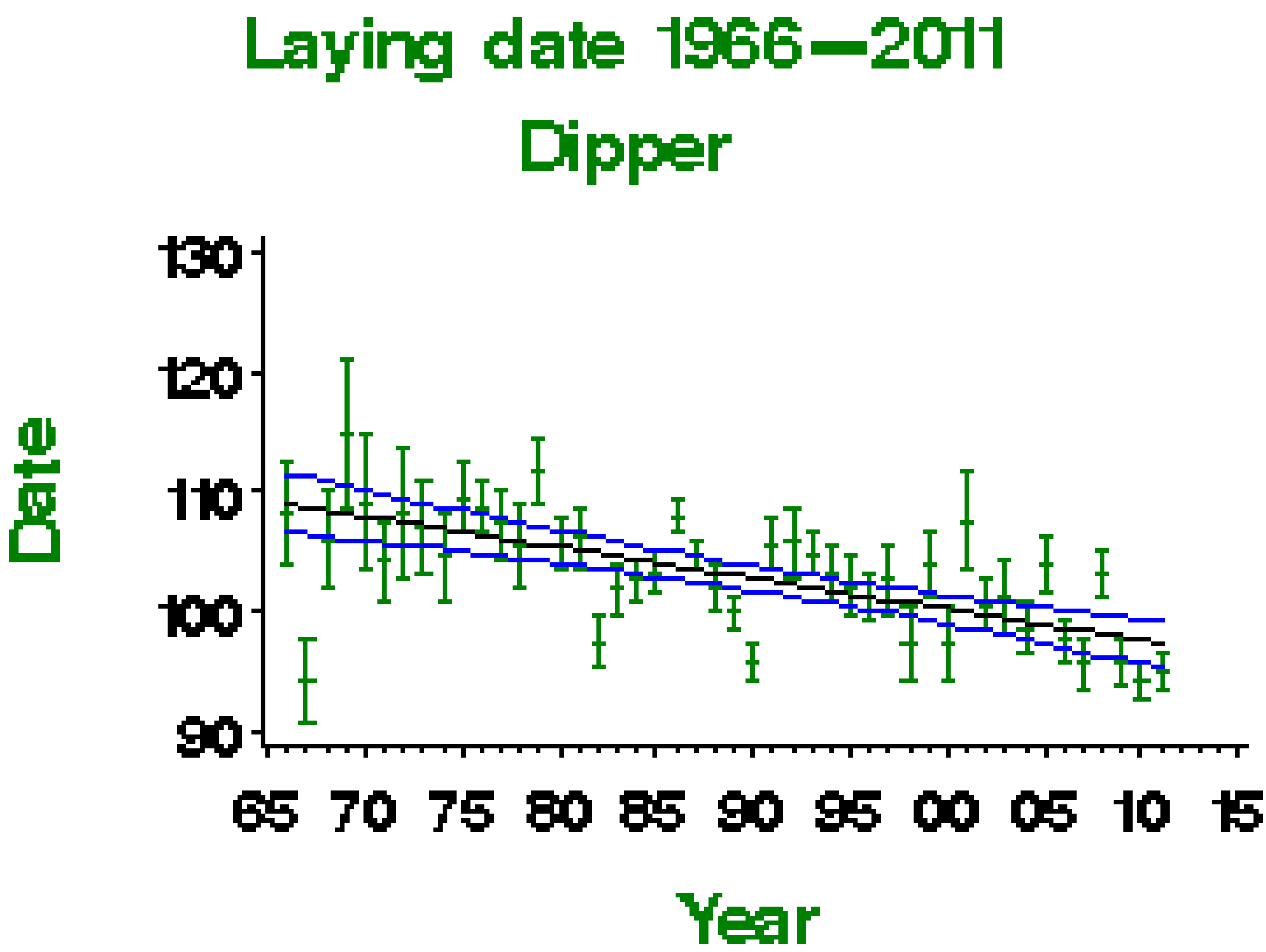


BBS UK graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

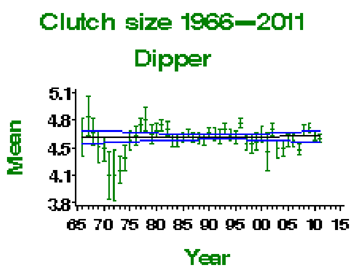


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

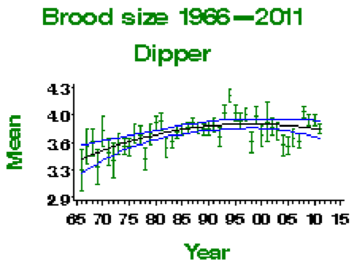
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	80	Curvilinear	2.06 fledglings	3.09 fledglings	50.6%		
Clutch size	42	1968-2010	75	None					
Brood size	42	1968-2010	146	Curvilinear	3.44 chicks	3.77 chicks	9.5%		
Nest failure rate at egg stage	42	1968-2010	105	Curvilinear	2.78% nests/day	0.34% nests/day	-87.8%		
Nest failure rate at chick stage	42	1968-2010	81	Curvilinear	0.62% nests/day	0.51% nests/day	-17.7%		
Laying date	42	1968-2010	64	Linear decline	Apr 19	Apr 8	-11 days		

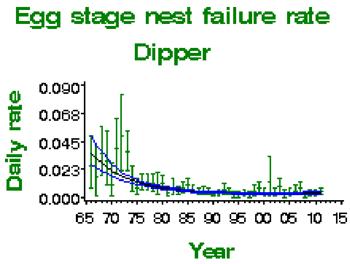
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



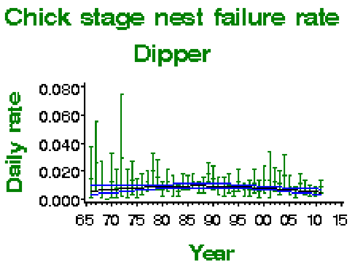
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



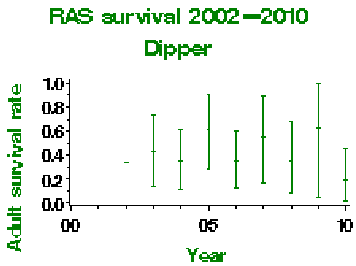
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of adult birds surviving to following year - error bars represent 95% confidence limits

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This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Ring Ouzel

Turdus torquatus

Key facts

Conservation listings:	Europe: no SPEC category (concentrated in Europe, conservation status favourable) (BiE04) UK: red (>50% population decline) (BoCC3) UK Biodiversity Action Plan: priority species
Long-term trend:	UK: decline
Population size:	6,200-7,500 pairs in 1999 (APEP13: Wotton et al. 2002a)

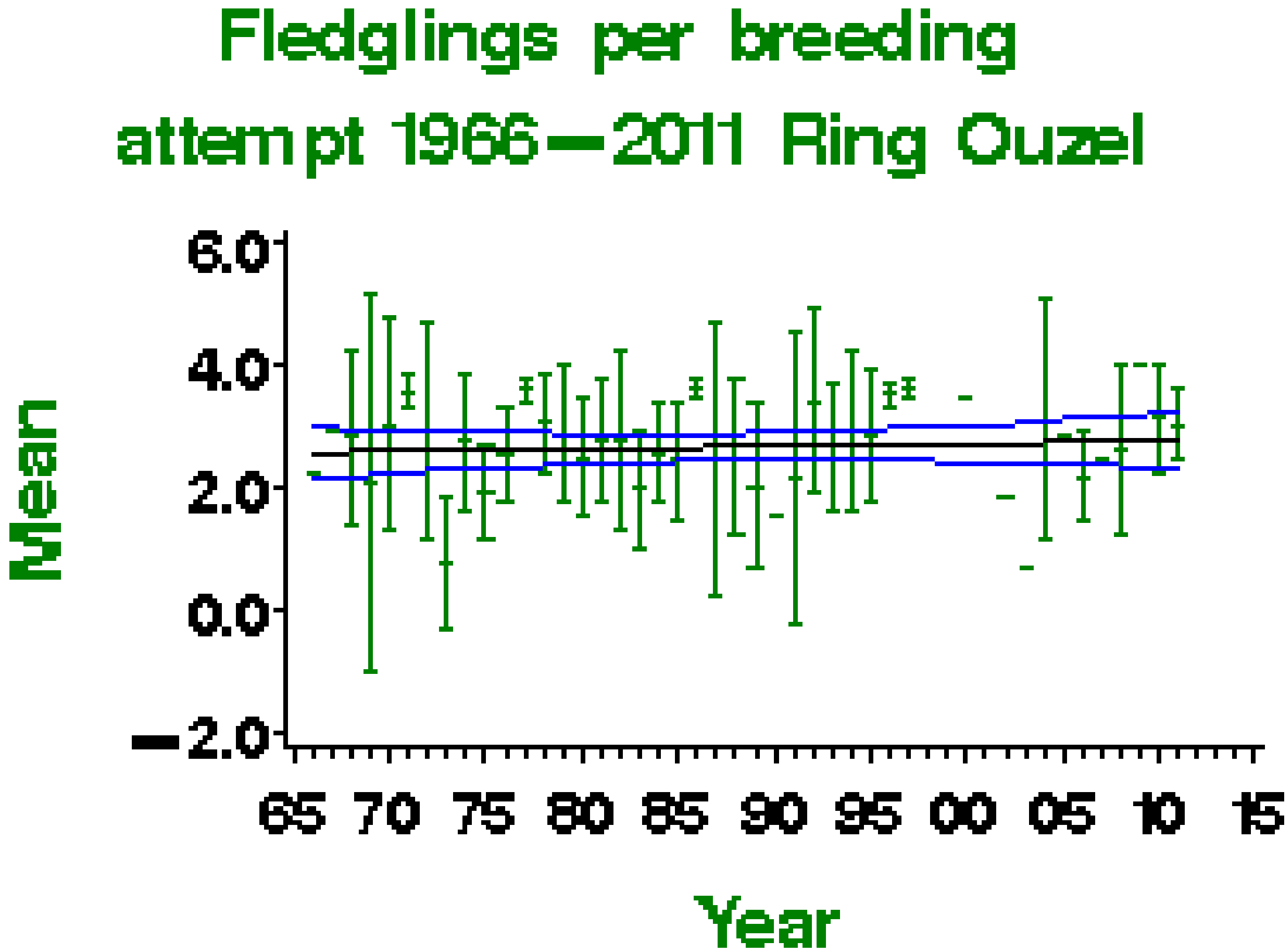
Status summary

The first breeding atlases showed a decline of 27% in the number of 10-km squares occupied between 1968-72 and 1988-91 (Gibbons et al. 1993), and the extent of population decline has since been established by a special survey: a 58% population decline was estimated for the period between 1988-91 and 1999, warranting red listing for this species (Gregory et al. 2002). Long-term surveys coordinated by the Sim et al. 2010). British & Irish bird observatory data show a decline in spring passage Ring Ouzels at western locations during 1970-98 that matches the estimated UK breeding decline, but no decline at eastern observatories where most birds are of Fennoscandian origin (Burfield & Brooke 2005). These authors infer that, since these populations winter together, the reasons for decline among UK breeders must lie on the breeding grounds or on passage: they also point out that UK birds are more exposed to hunting pressures, particularly in southwest France. It has proved difficult to establish any reasons for decline that are linked to the breeding grounds (Buchanan et al. 2003). In southeast Scotland, however, the breeding sites that are still occupied tend to be those at higher altitude and that have retained an extensive cover of heather (Sim et al. 2007b). In the same study, it was shown that declines were greatest in years following warm summers on the breeding grounds and also greater two years after high spring rainfall in Morocco: these results suggest that the population decline could be linked to reduced food supplies, and consequently higher rates of natural mortality, in autumn and winter (Beale et al. 2006). Large areas of apparently suitable juniper scrub, with abundant berries but no wintering Ring Ouzels, exist in the Atlas Mountains, however (Green et al. 2012). Low survival between breeding seasons is apparently a major national cause of decline (Sim et al. 2010). Within Glen Clunie, however, Sim et al. (2011) found that varying combinations of demographic factors produced each year-to-year decline.

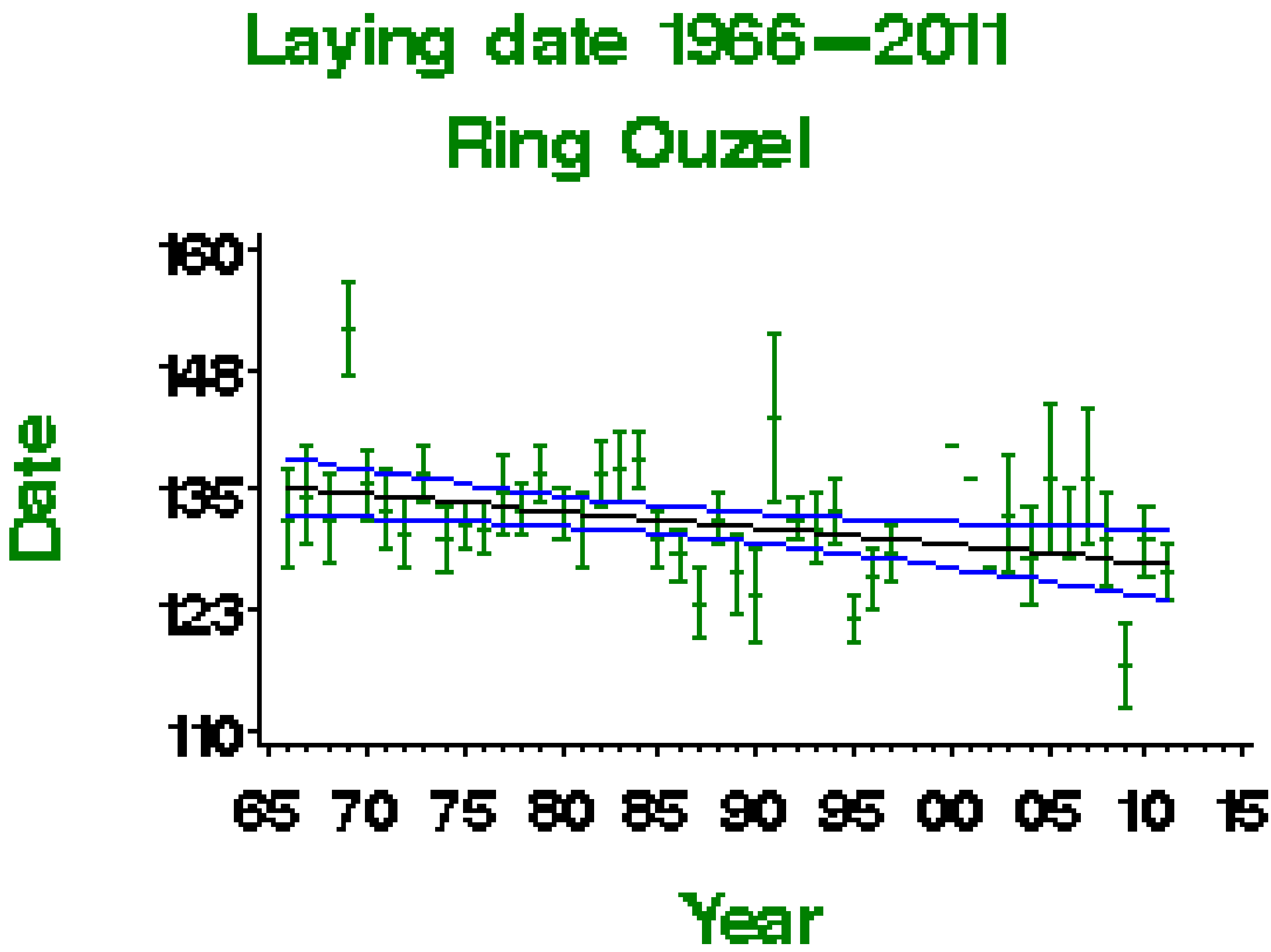
Population changes in detail

Annual breeding population changes for this species are not currently monitored by BTO

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend



Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

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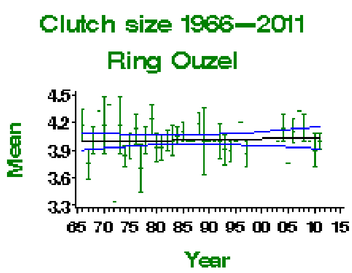
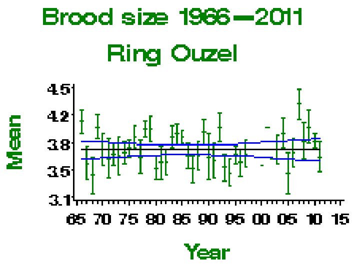
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	10	None					
Brood size	42	1968-2010	21	None					Small sample
Nest failure rate at egg stage	42	1968-2010	11	None					Small sample
Nest failure rate at chick stage	42	1968-2010	14	None					Small sample
Laying date	42	1968-2010	21	Linear decline	May 15	May 8	-7 days		Small sample

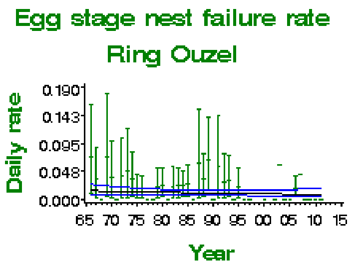
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



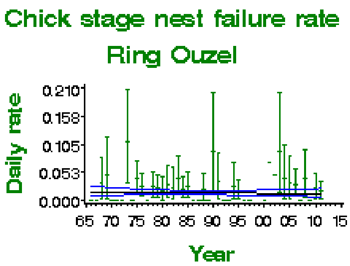
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

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Blackbird

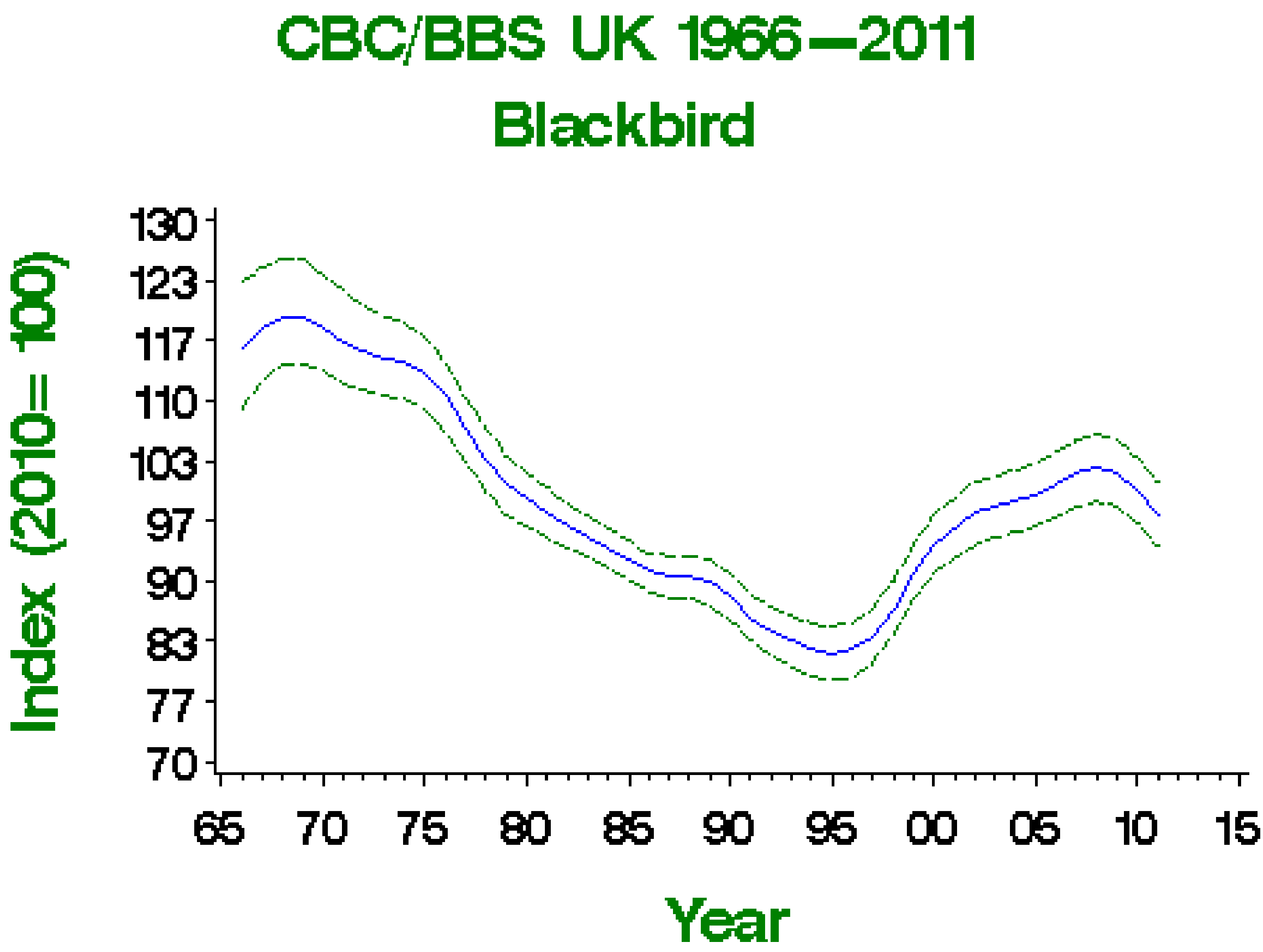
Turdus merula

Key facts

Conservation listings:	Europe: no SPEC category (concentrated in Europe, conservation status favourable) (BiE04) UK: green (BoCC3)
Long-term trend:	UK, England: shallow decline
Population size:	5.1 (4.9-5.3) million pairs in 2009 (APEP13: distance sampling estimate for 2006 (Newson et al. 2008) updated using BBS trend)

Status summary

Both CBC/BBS and CES data show long-term declines in Blackbird abundance up to about the mid 1990s, followed by a strong but partial recovery. The BBS Siriwardena et al. 1998a), although there has been little overall change in survival as recorded by CES since 1983. Annual population changes correlate best with adult survival, but population processes appear to differ between eastern and western Britain (Robinson et al. 2012). Fledgling numbers per breeding attempt increased during the population decline and are now decreasing again. Agricultural intensification is likely to have contributed to the population decline (Fuller et al. 1995), but, since numbers fell in woodland as well as farmland, additional factors probably operated. There has been widespread moderate increase across Europe since 1980 (PECBMS 2012a).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

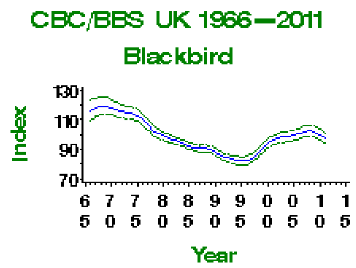
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	1049	-15	-23	-6		
	25	1985-2010	1638	8	2	15		
	10	2000-2010	2711	6	4	9		
	5	2005-2010	3066	1	-1	2		

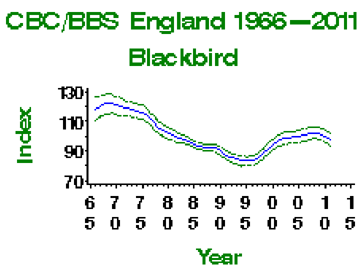
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	43	1967-2010	849	-17	-26	-7		
	25	1985-2010	1316	6	-1	13		
	10	2000-2010	2158	6	4	8		
	5	2005-2010	2457	0	-1	2		
CES adults	26	1984-2010	99	-13	-26	-1		
	25	1985-2010	101	-9	-21	4		
	10	2000-2010	108	-5	-13	3		
	5	2005-2010	105	0	-6	7		
CES juveniles	26	1984-2010	89	-42	-61	-12	>25	
	25	1985-2010	92	-31	-49	-6	>25	
	10	2000-2010	98	-17	-31	-3		
	5	2005-2010	94	-26	-40	-13	>25	
BBS UK	15	1995-2010	2415	23	19	27		
	10	2000-2010	2695	7	5	9		
	5	2005-2010	3066	0	-1	1		
BBS England	15	1995-2010	1905	21	17	24		
	10	2000-2010	2111	6	4	9		
	5	2005-2010	2402	0	-2	1		
BBS Scotland	15	1995-2010	194	27	11	45		
	10	2000-2010	216	12	-1	26		
	5	2005-2010	253	2	-6	9		
BBS Wales	15	1995-2010	195	42	30	53		
	10	2000-2010	222	21	14	29		
	5	2005-2010	234	4	-1	10		
BBS N.Ireland	15	1995-2010	85	30	2	46		
	10	2000-2010	98	-20	-27	-13		
	5	2005-2010	104	-12	-17	-6		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

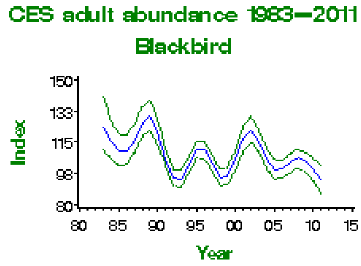
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



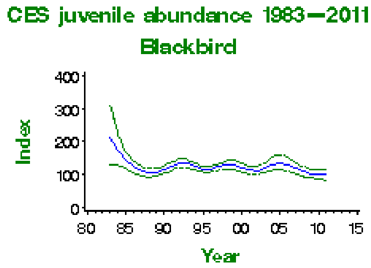
CBC/BBS UK graph



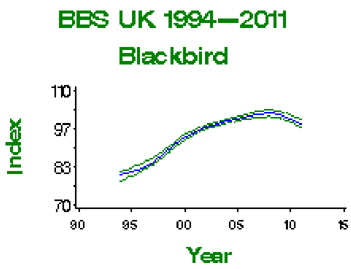
CBC/BBS England graph



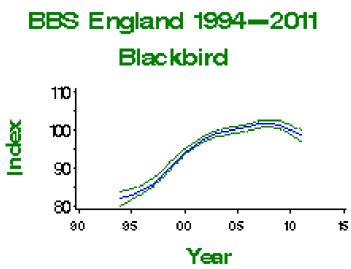
CES adults graph



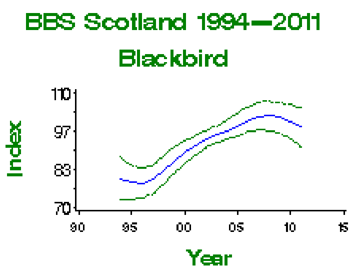
CES juveniles graph



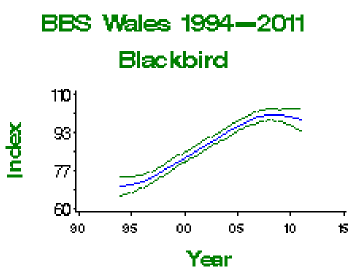
BBS UK graph



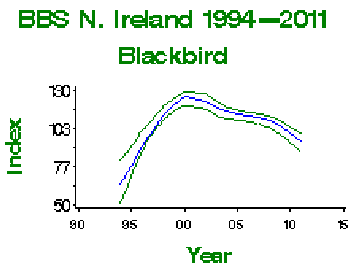
BBS England graph



BBS Scotland graph

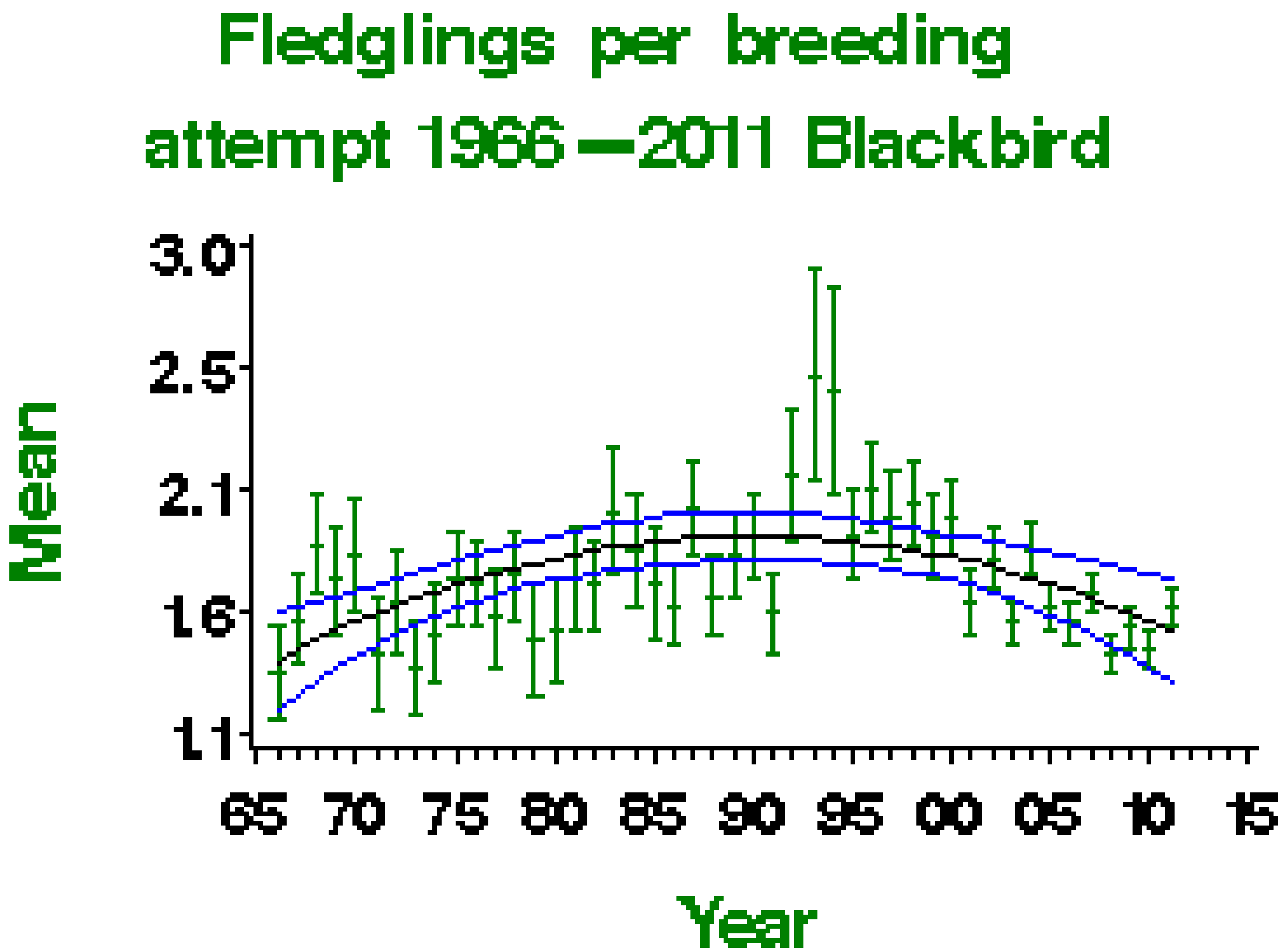


BBS Wales graph

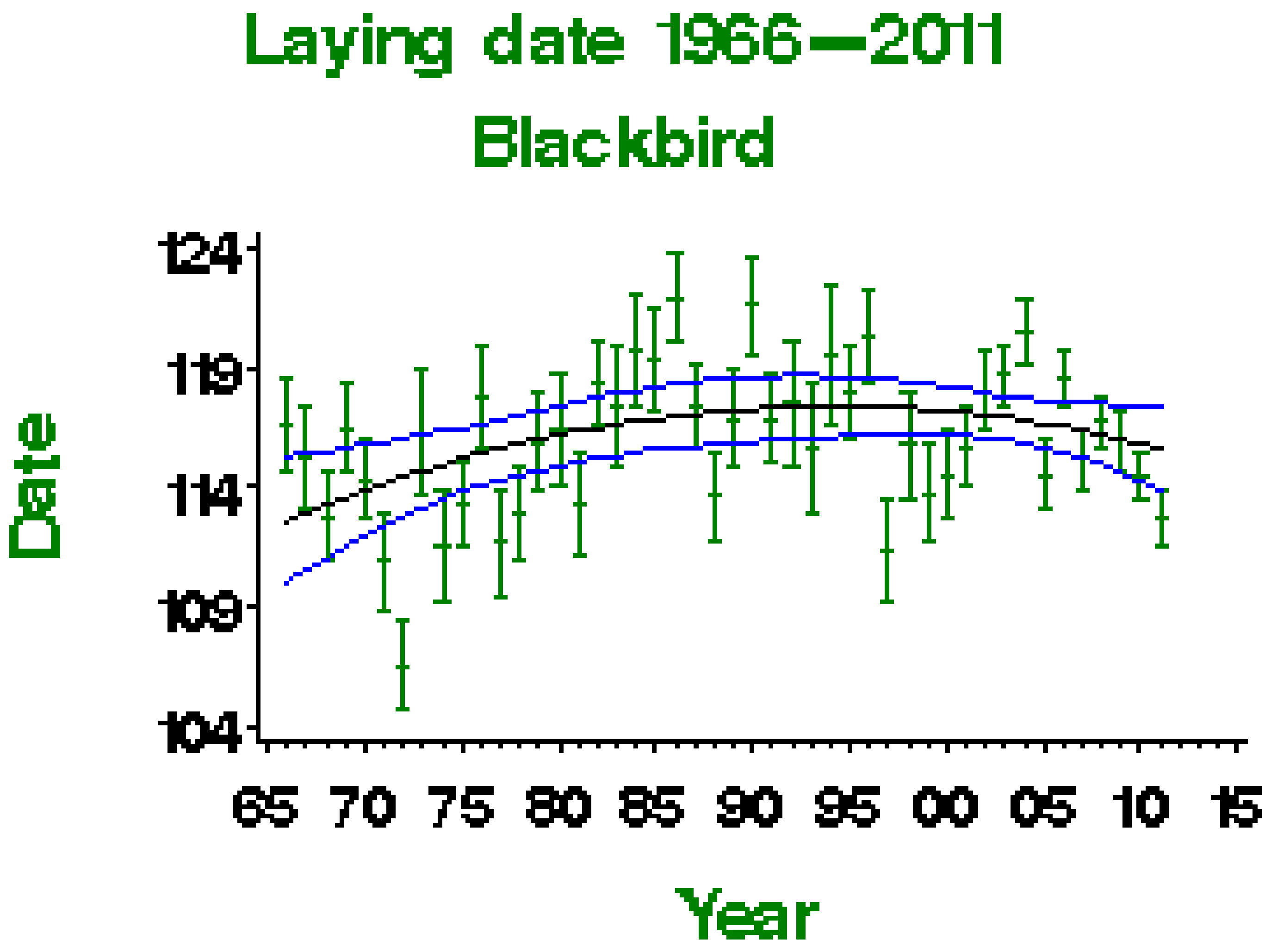


BBS N.Ireland graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

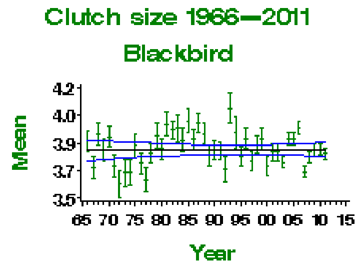


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

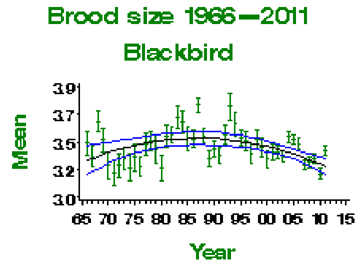
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	224	Curvilinear	1.47 fledglings	1.54 fledglings	5.4%		
Clutch size	42	1968-2010	186	None					
Brood size	42	1968-2010	245	Curvilinear	3.33 chicks	3.27 chicks	-1.9%		
Nest failure rate at egg stage	42	1968-2010	273	Curvilinear	2.63% nests/day	3.78% nests/day	43.7%		
Nest failure rate at chick stage	42	1968-2010	224	Linear decline	2.87% nests/day	1.91% nests/day	-33.4%		
Laying date	42	1968-2010	223	Curvilinear	Apr 23	Apr 26	3 days		
Juvenile to Adult ratio (CES)	26	1984-2010	101	Smoothed trend	162 Index value	100 Index value	-38%	>25	
Juvenile to Adult ratio (CES)	25	1985-2010	103	Smoothed trend	161 Index value	100 Index value	-38%	>25	
Juvenile to Adult ratio (CES)	10	2000-2010	110	Smoothed trend	120 Index value	100 Index value	-16%		
Juvenile to Adult ratio (CES)	5	2005-2010	106	Smoothed trend	135 Index value	100 Index value	-26%	>25	

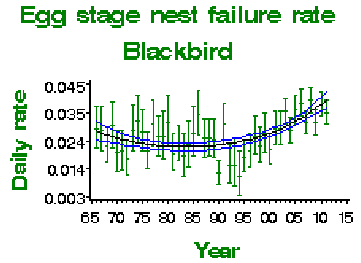
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



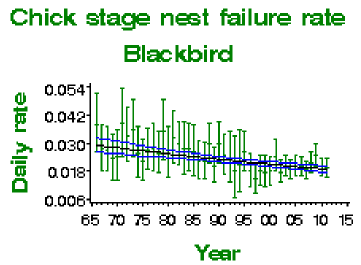
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



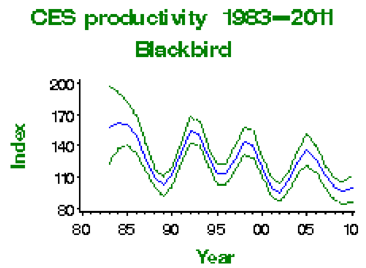
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



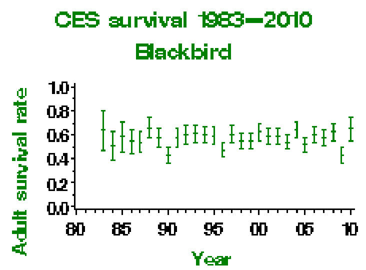
Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Smoothed long-term trend in ratio of juvenile:adult birds caught - green lines indicate 85% confidence limits



Proportion of adult birds surviving to following year - green bars represent 95% confidence limits

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Song Thrush

Turdus philomelos

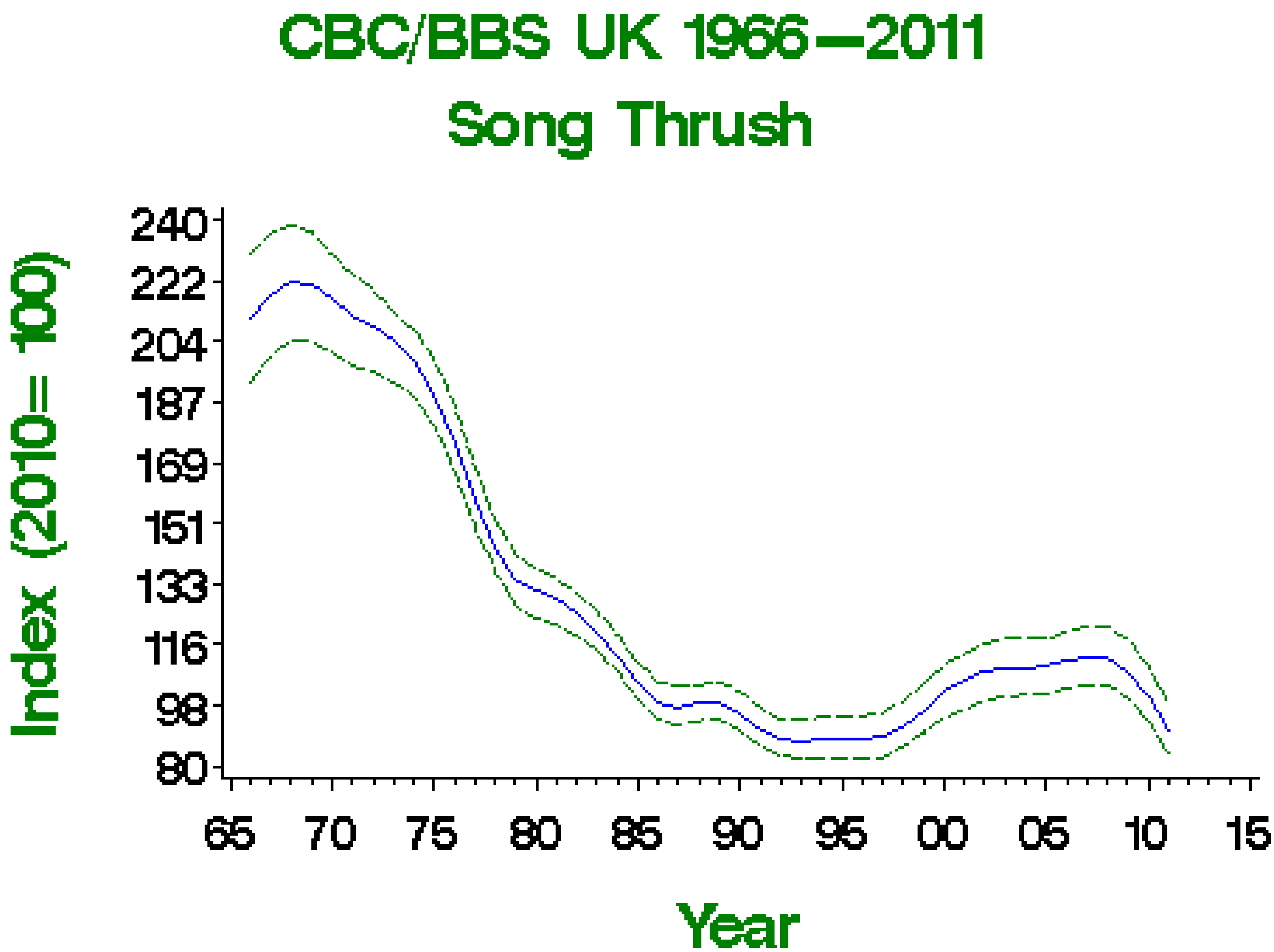
Key facts

Conservation listings:	Europe: no SPEC category (concentrated in Europe, conservation status favourable) (BiE04) UK: red (species level, races *clarkei* and *hebridensis*) (BoCC3) UK Biodiversity Action Plan: click here, priority species (*clarkei* and *hebridensis*)
Long-term trend:	UK: moderate decline England: rapid decline
Population size:	1.2 million territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Migrant status:	Short-distance migrant
Nesting habitat:	Above-ground nester
Primary breeding habitat:	Woodland
Secondary breeding habitat:	
Breeding diet:	Animal
Winter diet:	Animal

Status summary

CBC/BBS shows a rapid decline in Song Thrush abundance that began in the mid 1970s. The second half of this decline can also be seen in the CES index. Recent CBC/BBS data show a general increase, but population levels remain relatively low. The BBS PECBMS 2012a).



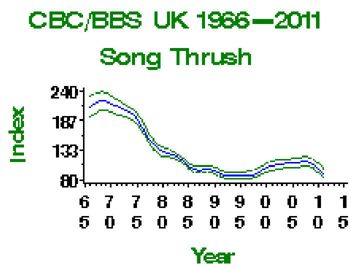
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

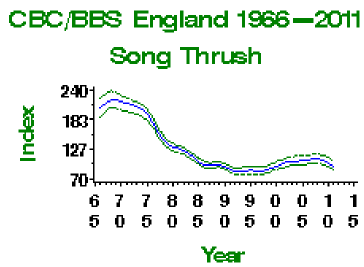
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	861	-54	-61	-45	>50	
	25	1985-2010	1324	-4	-15	8		
	10	2000-2010	2224	-1	-5	4		
	5	2005-2010	2526	-9	-11	-4		
CBC/BBS England	43	1967-2010	683	-54	-61	-44	>50	
	25	1985-2010	1041	-3	-14	12		
	10	2000-2010	1735	7	3	10		
	5	2005-2010	1985	-4	-6	-1		
CES adults	26	1984-2010	82	-30	-44	-15	>25	
	25	1985-2010	84	-22	-37	-4		
	10	2000-2010	92	-2	-14	9		
	5	2005-2010	89	-10	-19	2		
CES juveniles	26	1984-2010	69	-53	-68	-30	>50	
	25	1985-2010	70	-38	-56	-9	>25	
	10	2000-2010	78	-9	-24	8		
	5	2005-2010	75	-19	-30	-4		
BBS UK	15	1995-2010	1944	13	9	20		
	10	2000-2010	2210	-1	-4	4		
	5	2005-2010	2526	-10	-11	-6		
BBS England	15	1995-2010	1499	15	11	21		
	10	2000-2010	1698	7	4	11		
	5	2005-2010	1942	-5	-7	-3		
BBS Scotland	15	1995-2010	175	4	-10	27		
	10	2000-2010	195	-16	-28	-1		
	5	2005-2010	229	-20	-28	-10		
BBS Wales	15	1995-2010	167	17	8	34		
	10	2000-2010	192	-7	-14	3		
	5	2005-2010	204	-14	-18	-8		
BBS N.Ireland	15	1995-2010	76	39	12	78		
	10	2000-2010	90	-7	-17	10		
	5	2005-2010	97	-14	-19	0		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

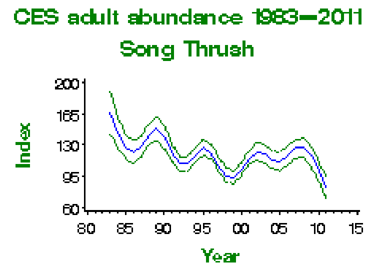
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



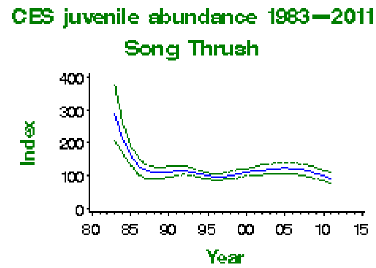
CBC/BBS UK graph



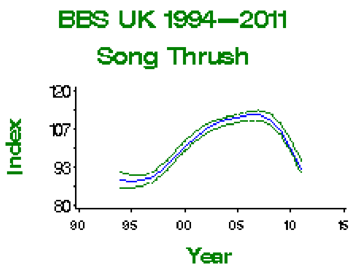
CBC/BBS England graph



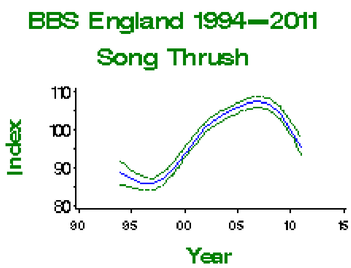
CES adults graph



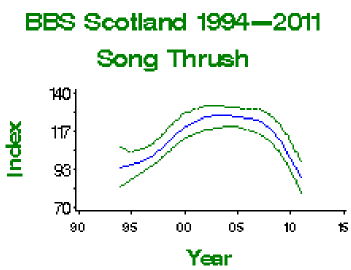
CES juveniles graph



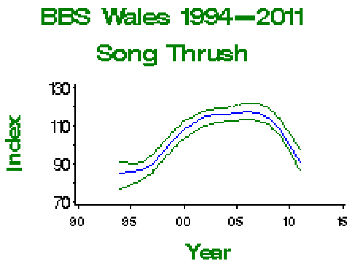
BBS UK graph



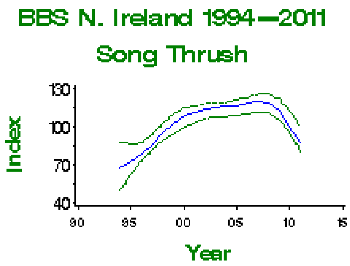
BBS England graph



BBS Scotland graph

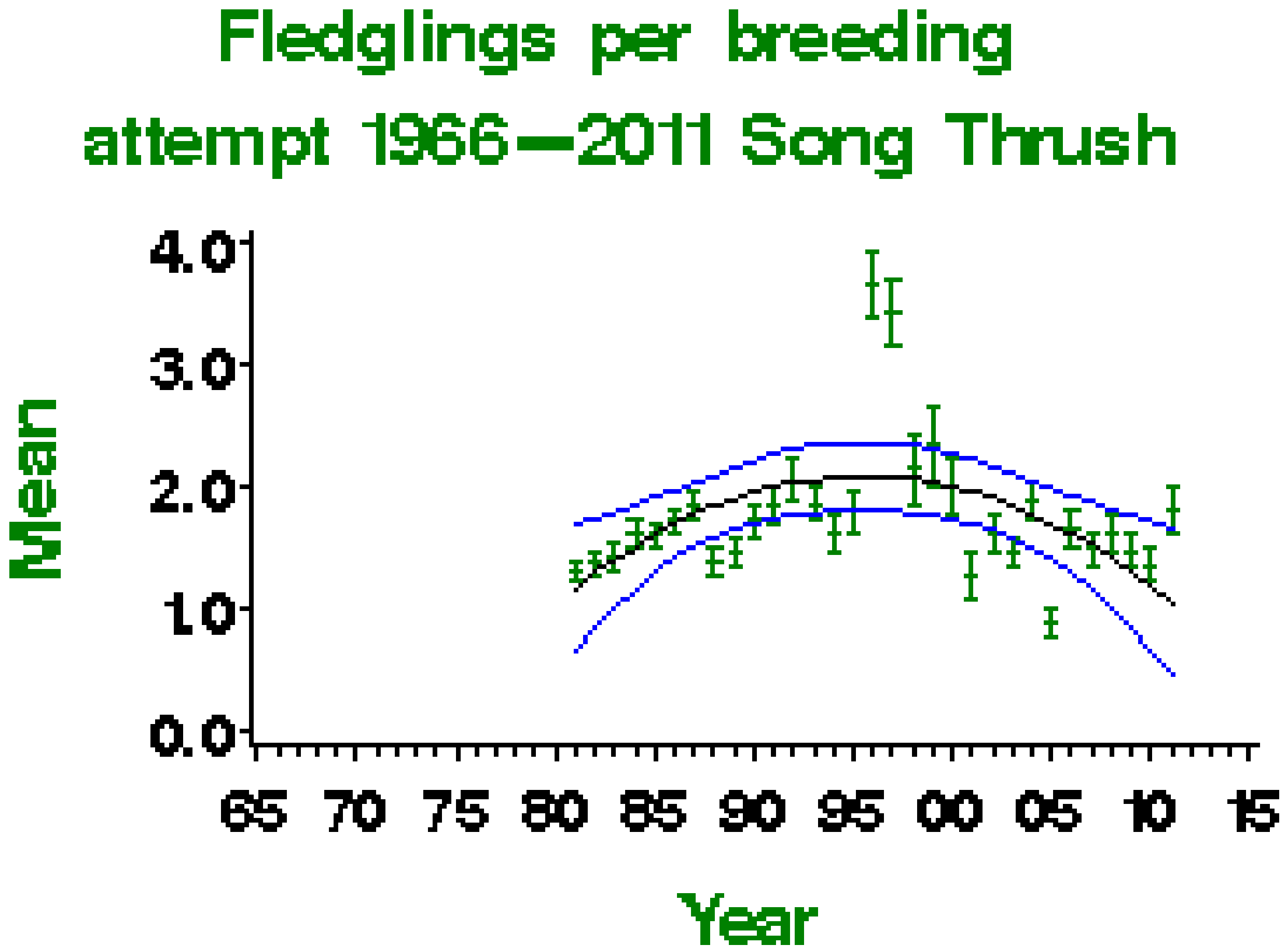


BBS Wales graph

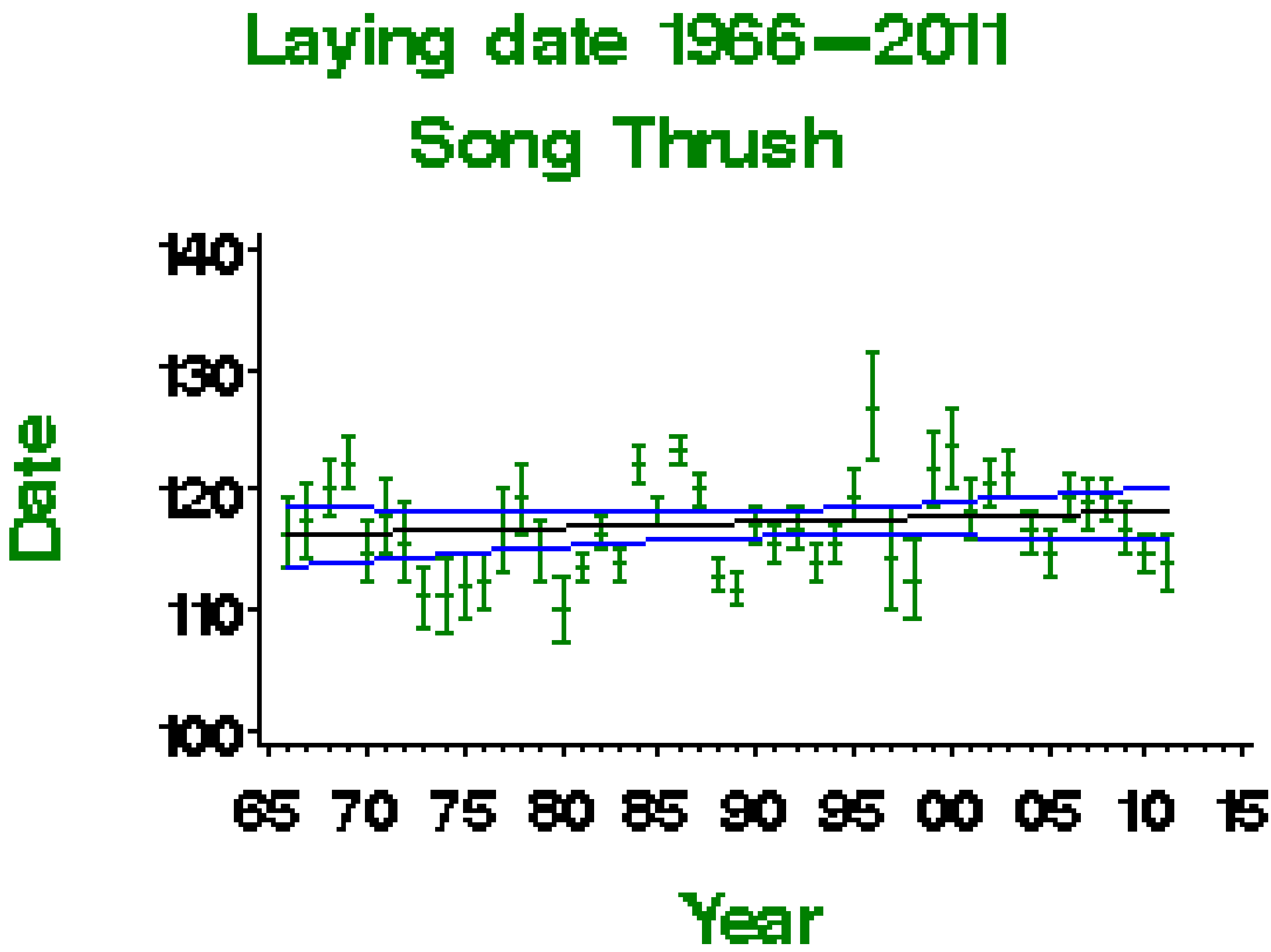


BBS N.Ireland graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

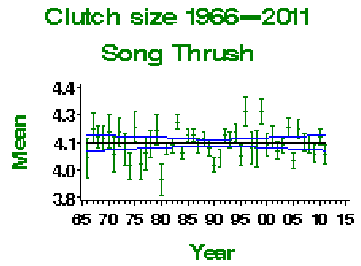


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

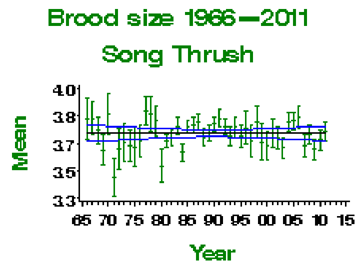
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	29	1981-2010	228	Curvilinear	1.18 fledglings	1.20 fledglings	1.4%		
Clutch size	42	1968-2010	170	None					
Brood size	42	1968-2010	189	None					
Nest failure rate at egg stage	29	1981-2010	310	Curvilinear	4.46% nests/day	4.86% nests/day	9.0%		
Nest failure rate at chick stage	29	1981-2010	228	Curvilinear	2.59% nests/day	2.38% nests/day	-8.1%		
Laying date	42	1968-2010	195	None			0 days		
Juvenile to Adult ratio (CES)	26	1984-2010	90	Smoothed trend	159 Index value	100 Index value	-37%	>25	
Juvenile to Adult ratio (CES)	25	1985-2010	92	Smoothed trend	136 Index value	100 Index value	-27%	>25	
Juvenile to Adult ratio (CES)	10	2000-2010	102	Smoothed trend	108 Index value	100 Index value	-8%		
Juvenile to Adult ratio (CES)	5	2005-2010	98	Smoothed trend	106 Index value	100 Index value	-6%		

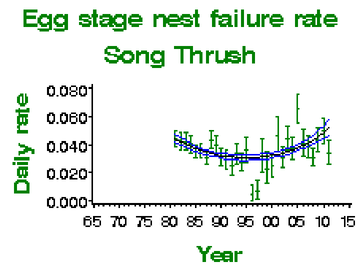
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



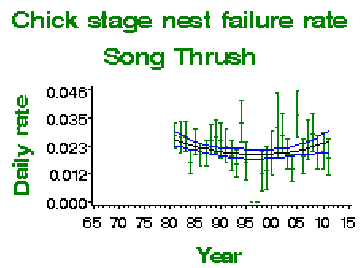
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



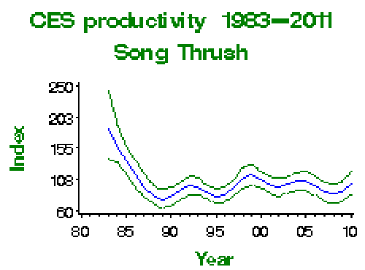
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



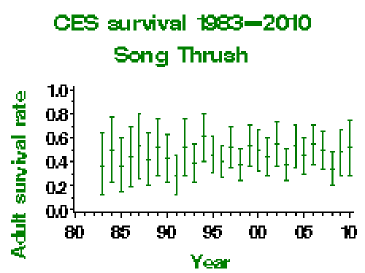
Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Smoothed long-term trend in ratio of juvenile:adult birds caught - green lines indicate 85% confidence limits



Proportion of adult birds surviving to following year - green bars represent 95% confidence limits

Causes of change

Changes in survival in the first winter, and perhaps also the post-fledging period, are sufficient to have caused the population decline. The environmental causes of this are unknown but are likely to include changes in farming practices, particularly land drainage and possibly increased pesticide usage.

Change factor	Primary driver	Secondary driver
Demographic	Decreased juvenile survival	
Ecological	Unknown	

Further information on causes of change

CES productivity shows an initial decrease, followed by some partial recovery, and the number of fledglings per breeding attempt increased during the 1980s and 1990s (see above). There is good evidence to show that changes in survival in the first winter, and perhaps also the post-fledging period, are sufficient to have caused the population decline (Thomson et al. 1997, Siriwardena et al. 1998, Robinson et al. 2004).

Peach et al. (2004) suggested that loss of hedgerows, scrub and permanent grassland with livestock and the widespread installation of field drainage systems, all of which would act to reduce the availability of good quality foraging areas, have probably contributed to the decline of the Song Thrush in the UK. Similarly, it has been suggested that the species is unable to survive the winter in woodland, due to a lack of food, and a reduction of food supply in other habitat types has also been reported (Simms 1989). It is likely that a reduction in food supply would adversely affect the survival of juvenile birds to a greater extent than adult birds, as appears to be the case (Robinson et al. 2004). Furthermore survival is reduced during periods of long drought or cold weather when food is likely to be less available (Robinson et al. 2007).

In woodland, drainage of damp ground and the depletion of woodland shrub layers through canopy closure and deer browsing may also be implicated (Fuller et al. 2005). There is also some concern of the impact of overgrazing by deer (e.g. Gill & Beardall 2001) and canopy closure (Mason 2007), due to changes in woodland management (Hopkins & Kirby 2007) on the low woodland layers, although good evidence from the UK is sparse (but there are some experimental studies in America on different species which demonstrate this effect, e.g. McShea & Rappole 2000). Several papers (e.g. Gosler 1990, Perrins & Overall 2001, Perrins 2003) state that the understorey has declined in Britain, but few data are available to support this on a national scale. However, Amar et al. (2006) found a 27% increase in understorey in the RSPB sites used in the Repeat Woodland Bird Survey.

Robinson et al. (2004) suggested that predation was a candidate cause of reduced survival but there is conflicting evidence on the role of predators in Song Thrush decline, and further research is needed. Newson et al. (2010b) found no evidence of effects of avian predators or grey squirrels on Song Thrushes.

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Mistle Thrush

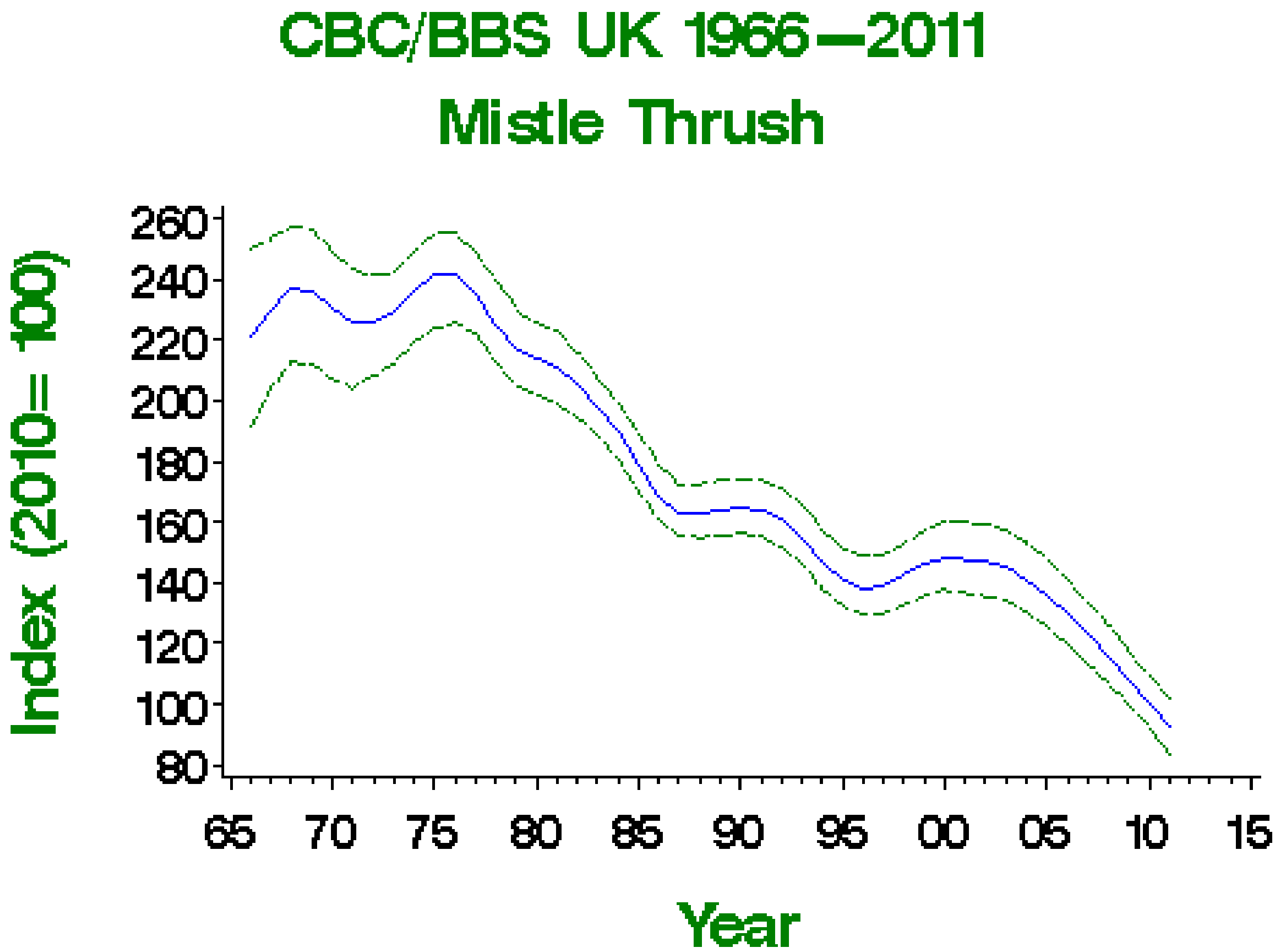
Turdus viscivorus

Key facts

Conservation listings:	Europe: no SPEC category (concentrated in Europe, conservation status favourable) (BiE04) UK: amber (25-50% population decline) (BoCC3)
Long-term trend:	UK, England: rapid decline
Population size:	170,000 territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Status summary

Like those of Siriwardena et al. 1998). Numbers have shown moderate decline across Europe since 1980, though with little change since 1990 (PECBMS 2012a).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

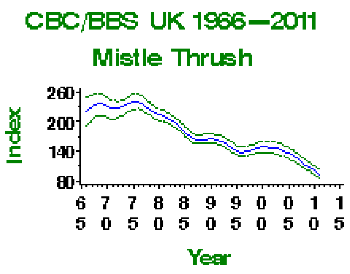
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	538	-56	-63	-46	>50	
	25	1985-2010	814	-44	-50	-36	>25	
	10	2000-2010	1288	-33	-37	-28	>25	
	5	2005-2010	1392	-26	-30	-22	>25	
CBC/BBS England	43	1967-2010	437	-59	-66	-47	>50	
	25	1985-2010	656	-49	-55	-41	>25	
	10	2000-2010	1016	-35	-39	-31	>25	

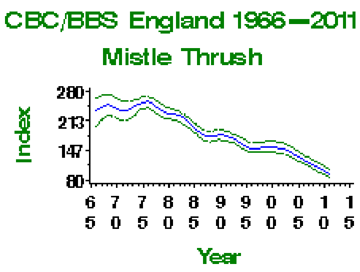
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	5	2005-2010	1100	-24	-28	-20		
BBS UK	15	1995-2010	1177	-28	-34	-21	>25	
	10	2000-2010	1279	-32	-37	-27	>25	
	5	2005-2010	1392	-26	-30	-22	>25	
BBS England	15	1995-2010	921	-35	-39	-30	>25	
	10	2000-2010	985	-35	-38	-31	>25	
	5	2005-2010	1061	-24	-28	-21		
BBS Scotland	15	1995-2010	78	-8	-34	31		
	10	2000-2010	87	-37	-51	-14	>25	
	5	2005-2010	103	-39	-50	-23	>25	
BBS Wales	15	1995-2010	100	-1	-20	22		
	10	2000-2010	112	-8	-21	8		
	5	2005-2010	115	-5	-17	8		
BBS N.Ireland	15	1995-2010	59	-12	-58	47		
	10	2000-2010	70	-31	-45	-16	>25	
	5	2005-2010	73	-34	-42	-23	>25	

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

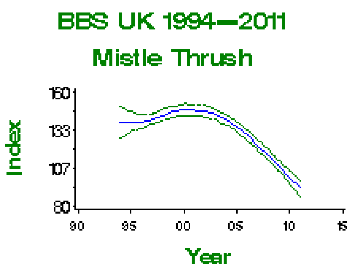
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



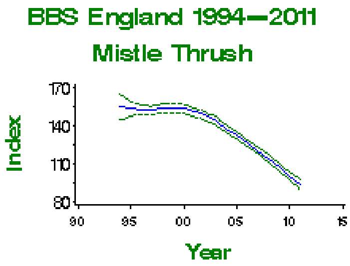
CBC/BBS UK graph



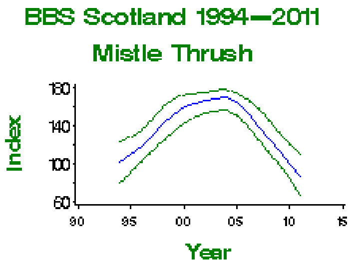
CBC/BBS England graph



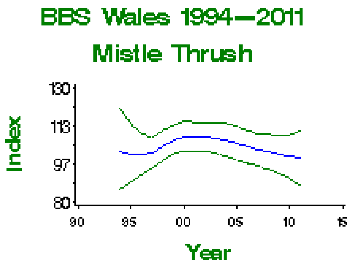
BBS UK graph



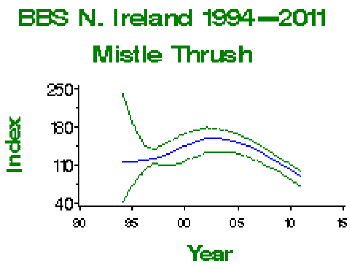
BBS England graph



BBS Scotland graph



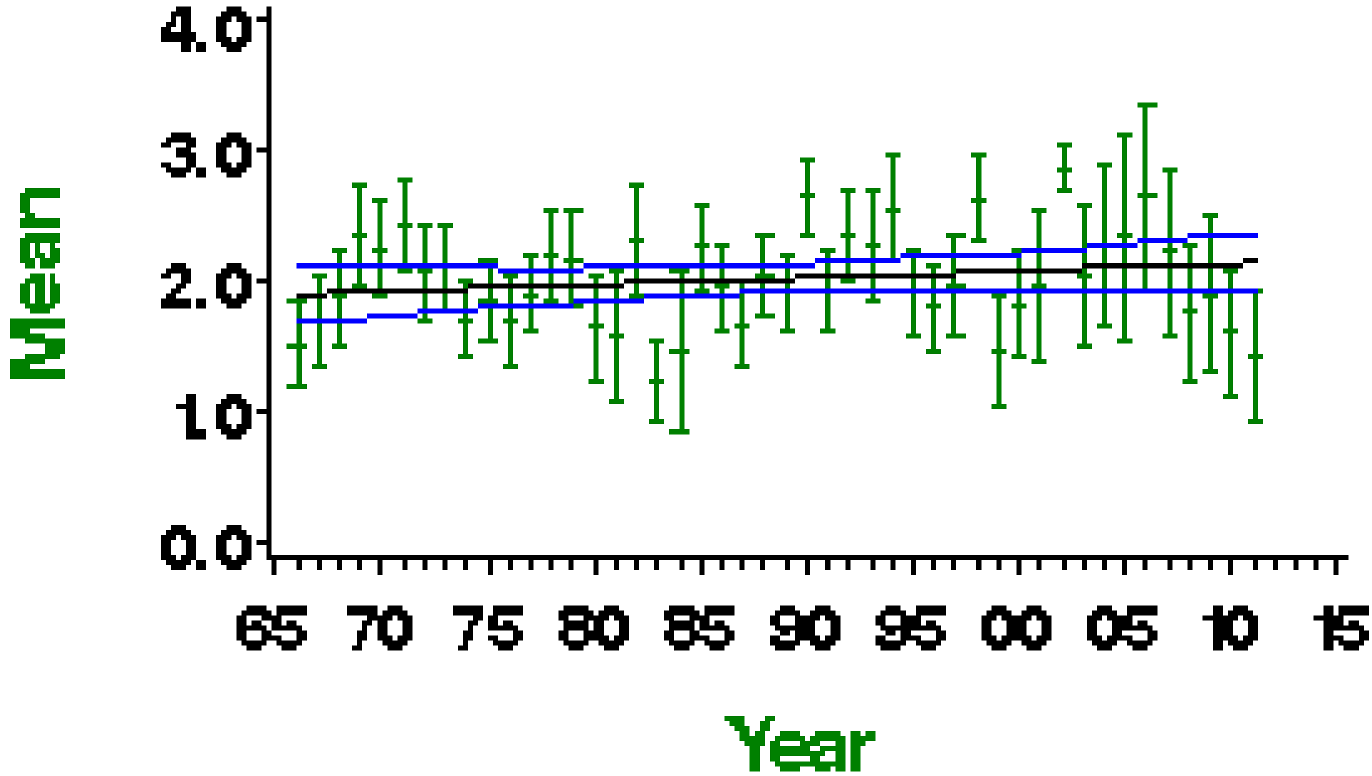
BBS Wales graph



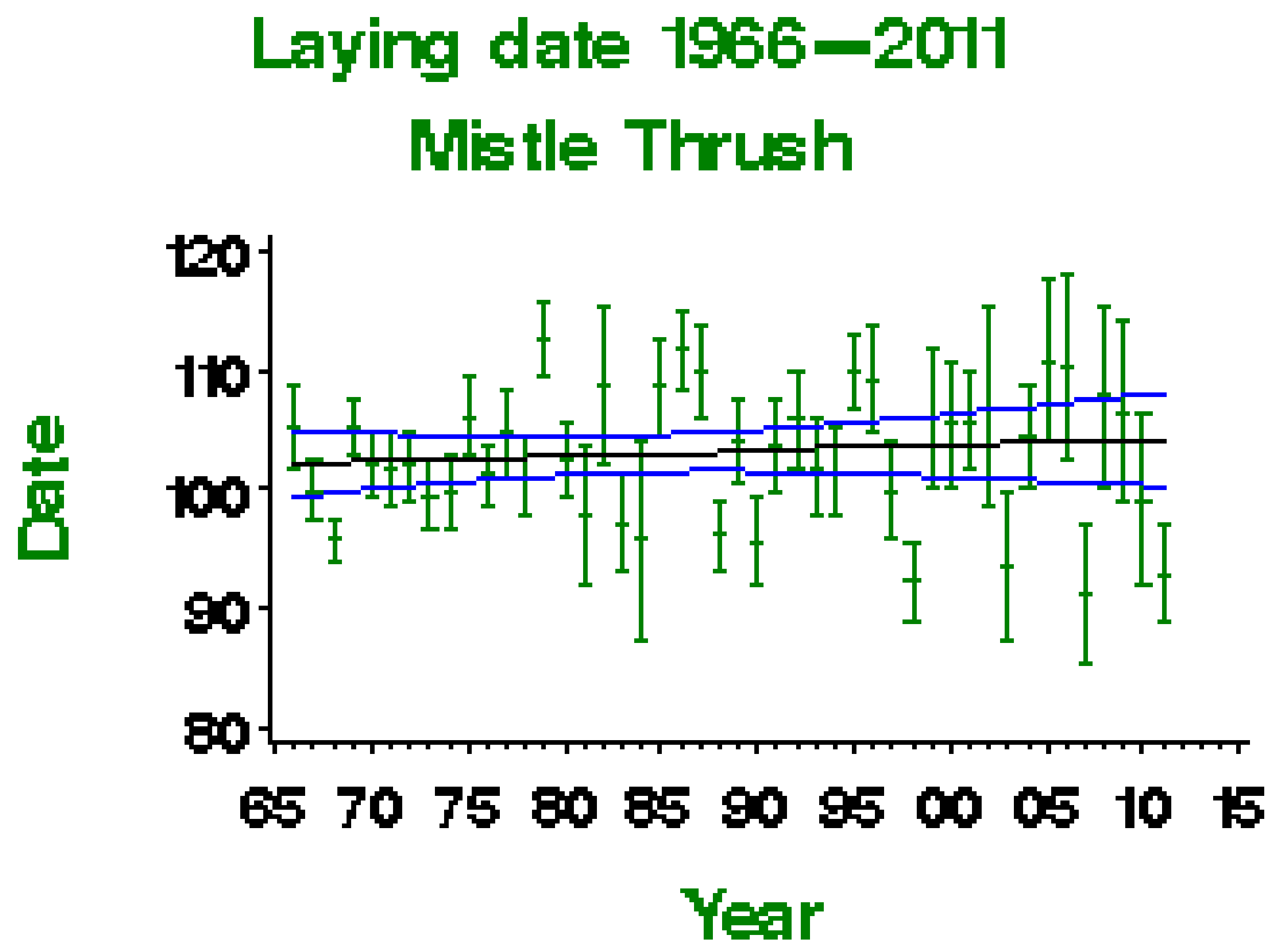
BBS N.Ireland graph

Demographic trends

Fledglings per breeding attempt 1966–2011 Mistle Thrush



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend



Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

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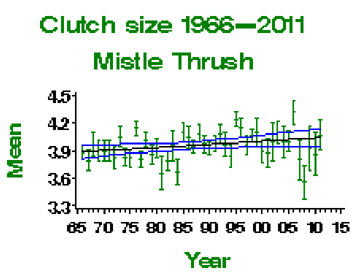
More on demographic trends

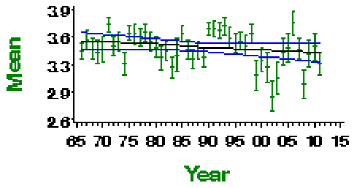
Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	52	None					
Clutch size	42	1968-2010	33	Linear increase	3.90 eggs	4.04 eggs	3.7%		
Brood size	42	1968-2010	65	None					
Nest failure rate at egg stage	42	1968-2010	54	Linear decline	2.48% nests/day	1.75% nests/day	-29.4%		
Nest failure rate at chick stage	42	1968-2010	57	None					
Laying date	42	1968-2010	27	None			0 days		Small sample

For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



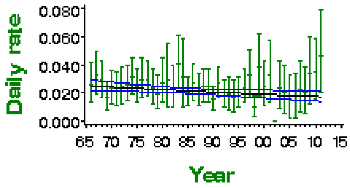
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend

Brood size 1966—2011
Mistle Thrush



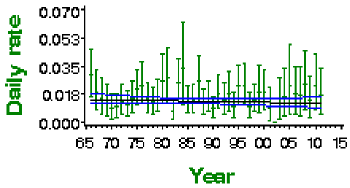
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend

Egg stage nest failure rate
Mistle Thrush



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

Chick stage nest failure rate
Mistle Thrush



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

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Spotted Flycatcher

Muscicapa striata

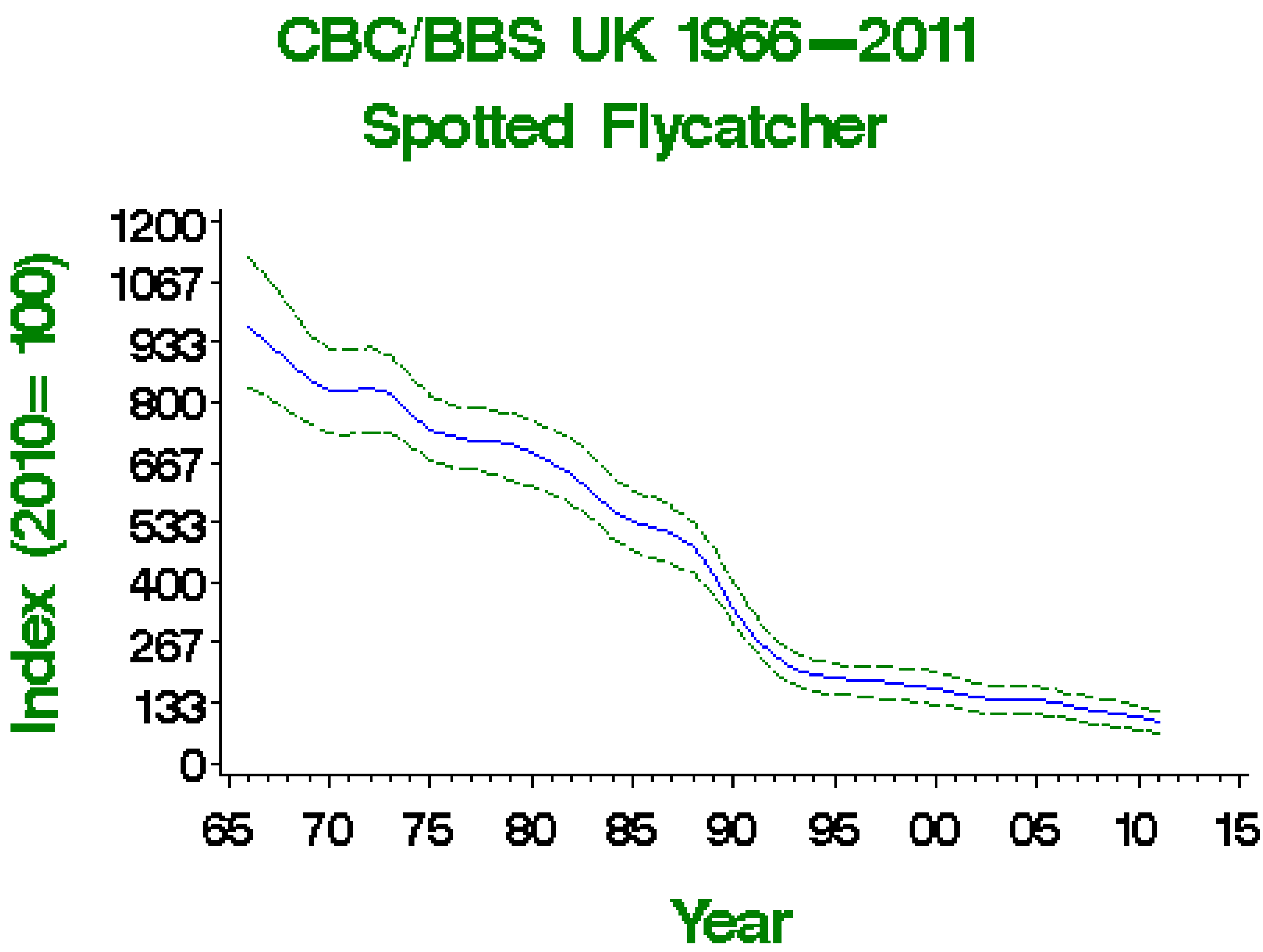
Key facts

Conservation listings:	Europe: SPEC category 3 (declining) (BiE04) UK: red (>50% population decline) (BoCC3) UK Biodiversity Action Plan: click here, priority species
Long-term trend:	UK, England: rapid decline
Population size:	36,000 territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Migrant status:	Long-distance migrant
Nesting habitat:	Above-ground nester
Primary breeding habitat:	Woodland
Secondary breeding habitat:	
Breeding diet:	Animal
Winter diet:	Animal

Status summary

Spotted Flycatchers have declined rapidly and consistently since the 1960s. The Repeat Woodland Bird Survey, however, using a set of CBC woodland and RSPB sites, detected a significant increase between the 1980s and 2003-04 in southwest England (Amar et al. 2006, Hewson et al. 2007), suggesting that change has not been uniform across Britain. Numbers have shown widespread moderate decrease across Europe since 1980, though with little change since 1990 (PECBMS 2012a).



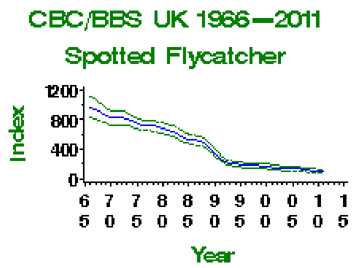
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

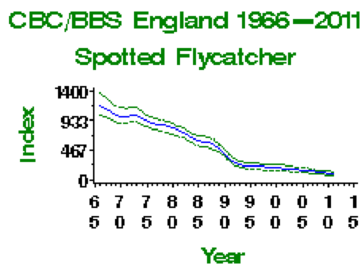
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	127	-89	-93	-85	>50	
	25	1985-2010	157	-81	-88	-75	>50	
	10	2000-2010	197	-39	-54	-23	>25	
	5	2005-2010	195	-28	-42	-11	>25	
CBC/BBS England	43	1967-2010	96	-91	-95	-87	>50	
	25	1985-2010	115	-84	-89	-77	>50	
	10	2000-2010	139	-48	-57	-38	>25	
	5	2005-2010	136	-33	-45	-22	>25	
BBS UK	15	1995-2010	197	-50	-62	-36	>25	
	10	2000-2010	194	-38	-53	-22	>25	
	5	2005-2010	195	-26	-42	-10	>25	
BBS England	15	1995-2010	138	-55	-64	-44	>50	
	10	2000-2010	132	-45	-55	-36	>25	
	5	2005-2010	129	-31	-44	-20	>25	

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

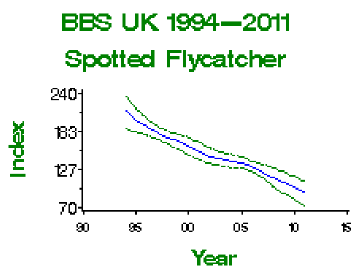
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



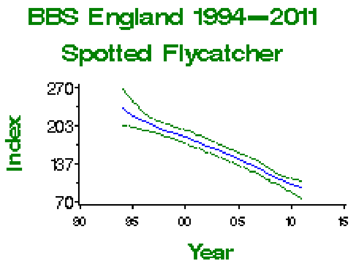
CBC/BBS UK graph



CBC/BBS England graph

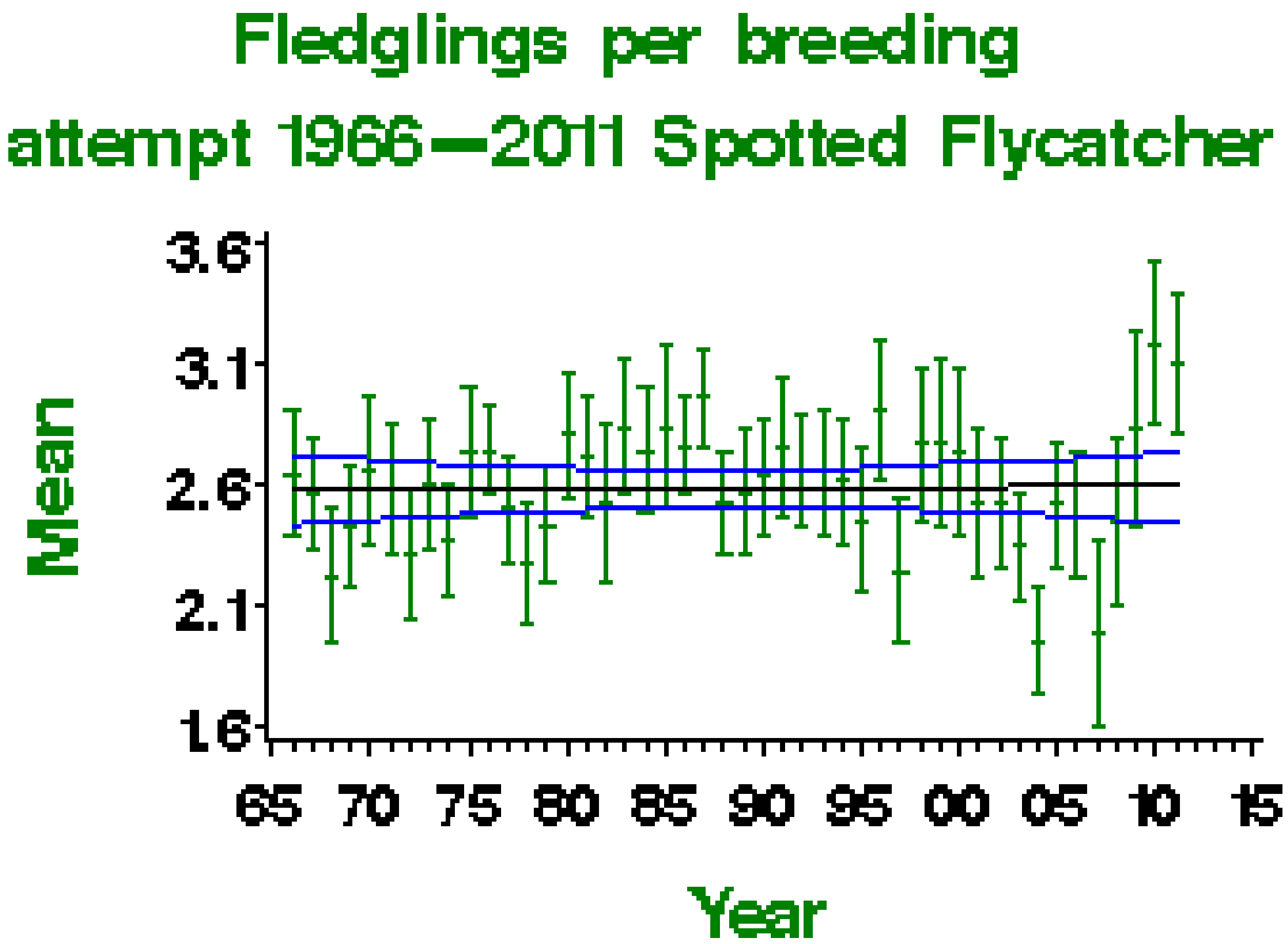


BBS UK graph

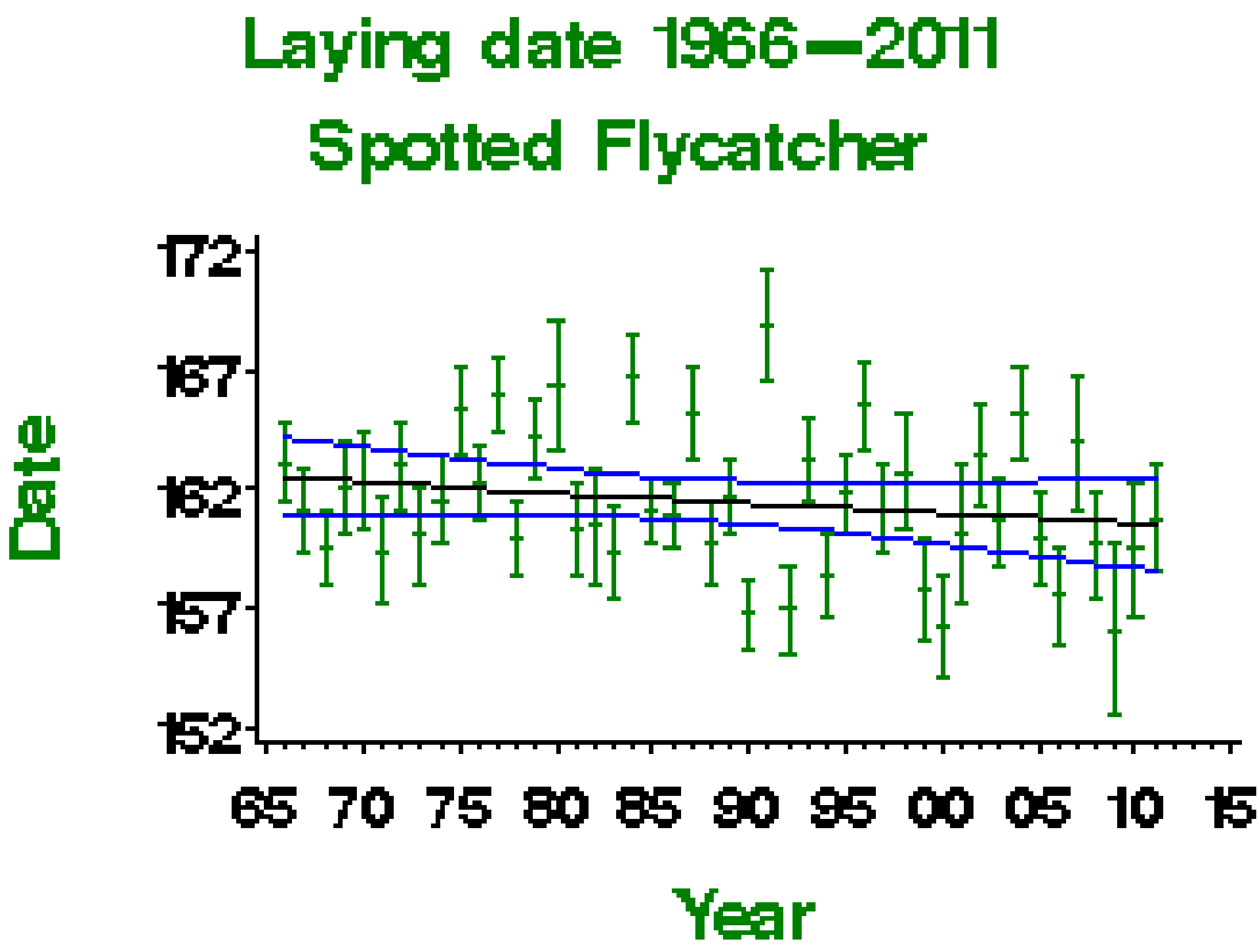


BBS England graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

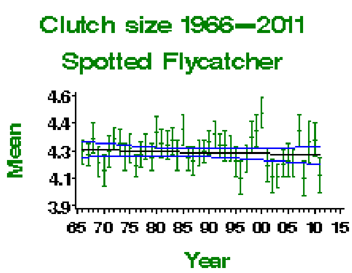


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

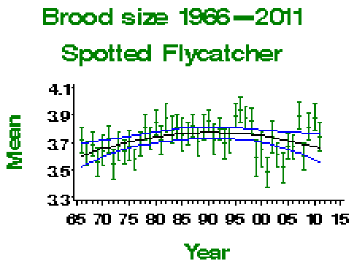
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	103	None					
Clutch size	42	1968-2010	78	None					
Brood size	42	1968-2010	129	Curvilinear	3.63 chicks	3.67 chicks	1.0%		
Nest failure rate at egg stage	42	1968-2010	115	Curvilinear	1.83% nests/day	1.73% nests/day	-5.5%		
Nest failure rate at chick stage	42	1968-2010	105	Linear increase	1.00% nests/day	1.40% nests/day	40.0%		
Laying date	42	1968-2010	70	None			0 days		

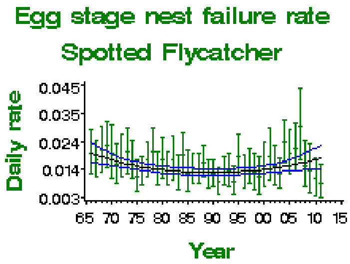
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



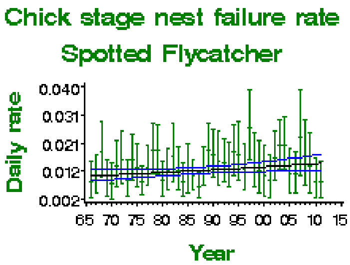
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

Causes of change

Demographic modelling provides evidence that a decrease in the annual survival rates of birds in their first year may have driven the decline. The ecological causes of the decline are uncertain as good-quality, direct evidence is sparse.

Change factor	Primary driver	Secondary driver
Demographic	Decreased survival	
Ecological	Unknown	

Further information on causes of change

Clutch size and brood size have both decreased slightly between 1968 and 2008 and daily failure rates have increased (see above). There has also been an increase in nest losses at the egg and chick stage while the number of fledglings per breeding attempt has decreased. Though samples are too small to continue presenting a trend, there was also a decrease overall in the ratio of juveniles to adults in CES captures. However, demographic modelling shows that decreases in the annual survival rates of birds in their first year of life are more likely to have driven the population decline than breeding parameters (Freeman & Crick 2003, Stevens et al. 2007). This effect on survival may operate in pre-migration period, during migration or in the wintering quarters. The number of adult Spotted Flycatchers caught at CES ringing sites was found to have declined drastically, providing further evidence that post-fledging and overwinter survival may be important factors in the population decline (Peach et al. 1998).

Evidence for the ecological causes of the decline is sparse. Fuller et al. (2005) hypothesise that declines in large flying insects that are food to the flycatcher, or conditions either on the wintering grounds or along migration routes may be involved. However, there is little detailed evidence to directly support any of these factors.

Data from the Repeat Woodland Bird Survey (Amaret al. 2006) showed that Spotted Flycatchers were more likely to have declined at sites with very open or very closed foliage conditions. Smart et al. (2007) also suggest this. However, overall, Amar et al. (2006) did not find that changes in habitat were significant in explaining population declines for this species. Stevens et al. (2007) found that nests in gardens more successful than those in farmland or woodland and nests in gardens fledged twice as many chicks as those in either woodland or farmland. The proximate cause of lower success in farmland and woodland was higher nest predation rates. In terms of nesting success, farmland and woodland appear to be suboptimal when compared with gardens, providing evidence of a problem on the breeding grounds for this species, in at least these two habitats (Stevens et al. 2007).

In Leicestershire, Stoate & Szczur (2006) found that the removal of nest predators prompted an increase in Spotted Flycatcher breeding success, especially in woodland, where nest success was lower overall than in gardens. However, Carpenter et al. (2009) found no link between presence/absence, abundance and population change of the species and avian predator abundance.

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Robin

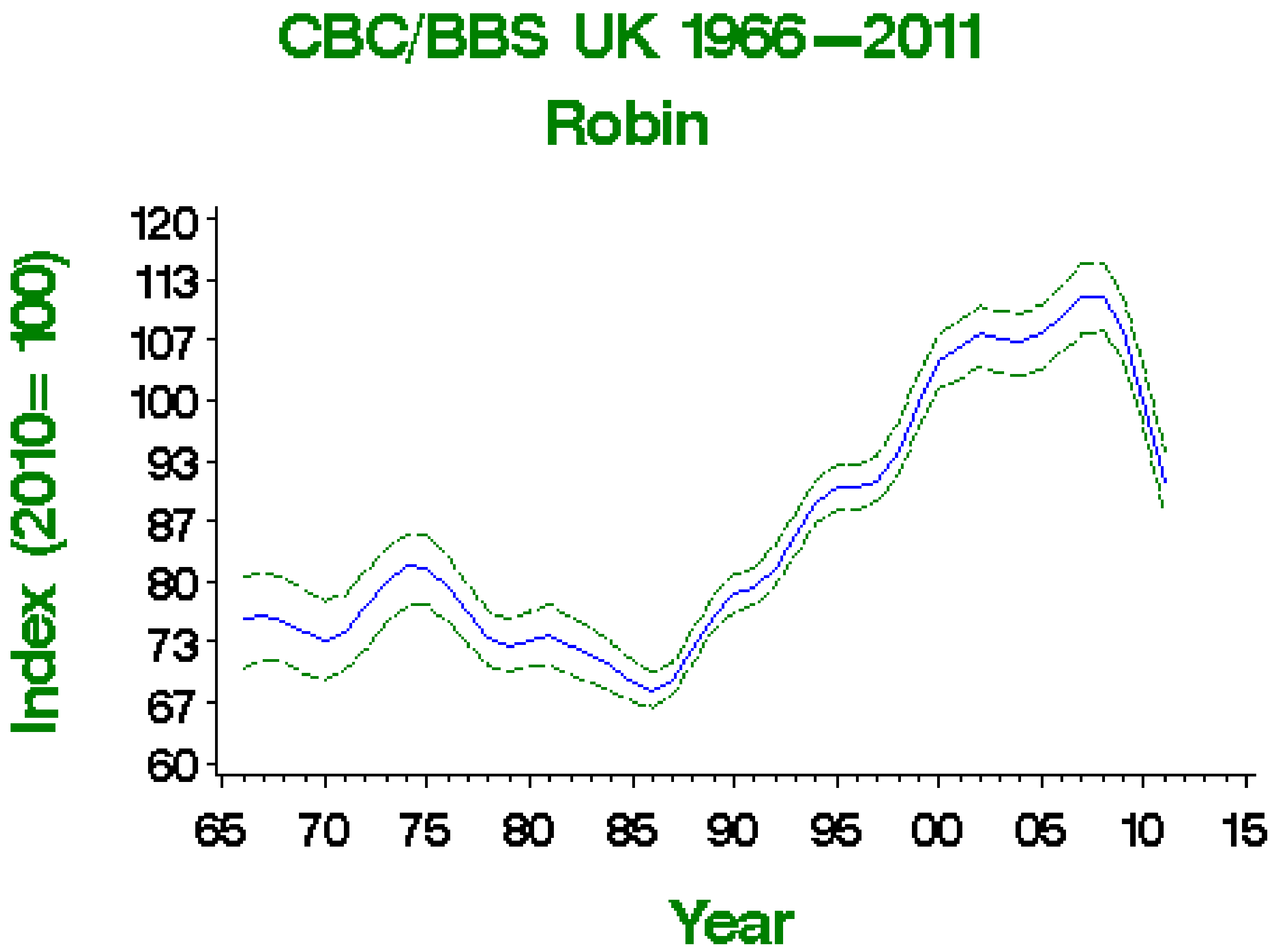
Erithacus rubecula

Key facts

Conservation listings:	Europe: no SPEC category (concentrated in Europe, conservation status favourable) (BiE04) UK: green (BoCC3)
Long-term trend:	UK: shallow increase England: moderate increase
Population size:	6.7 million territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Status summary

Robins have increased markedly since the mid 1980s, according to both CBC/BBS and CES results, having been set back earlier by a succession of cold winters. Steep improvements have occurred concurrently in the numbers of fledglings per breeding attempt, as measured by nest record data, due to reductions in nest failure rates at both egg and chick stages, although CES productivity measures have declined. Survival rates, as measured by CES, may perhaps show an increasing trend. The CES and BBS data show that marked and significant annual fluctuations occur in numbers, perhaps in response to winter weather, although these are not evident in the smoothed trends that are presented. The BBS PECBMS 2012a).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

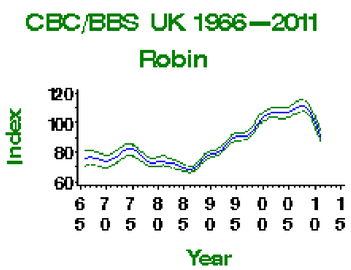
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	1009	31	19	46		
	25	1985-2010	1575	45	37	56		
	10	2000-2010	2614	-4	-6	-1		
	5	2005-2010	2960	-7	-8	-4		

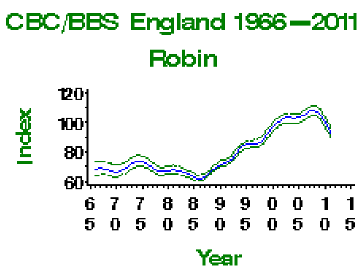
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	43	1967-2010	808	45	30	60		
	25	1985-2010	1254	59	49	69		
	10	2000-2010	2065	3	0	6		
	5	2005-2010	2353	-3	-5	-1		
CES adults	26	1984-2010	93	19	4	41		
	25	1985-2010	96	33	14	57		
	10	2000-2010	105	-14	-22	-5		
	5	2005-2010	101	-17	-24	-10		
CES juveniles	26	1984-2010	98	14	-13	58		
	25	1985-2010	101	29	-1	67		
	10	2000-2010	109	-6	-18	6		
	5	2005-2010	106	-2	-12	8		
BBS UK	15	1995-2010	2321	10	7	14		
	10	2000-2010	2598	-2	-5	1		
	5	2005-2010	2960	-8	-9	-6		
BBS England	15	1995-2010	1813	16	13	20		
	10	2000-2010	2021	4	1	7		
	5	2005-2010	2301	-4	-6	-2		
BBS Scotland	15	1995-2010	197	6	-5	18		
	10	2000-2010	215	-9	-17	1		
	5	2005-2010	256	-15	-19	-7		
BBS Wales	15	1995-2010	192	-9	-15	-1		
	10	2000-2010	217	-17	-23	-10		
	5	2005-2010	227	-21	-25	-15		
BBS N.Ireland	15	1995-2010	87	9	-11	26		
	10	2000-2010	100	-16	-23	-7		
	5	2005-2010	108	-4	-11	5		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

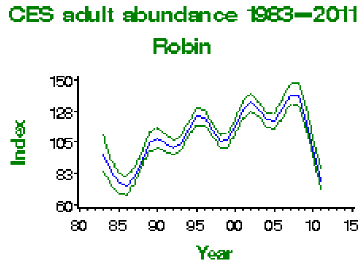
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



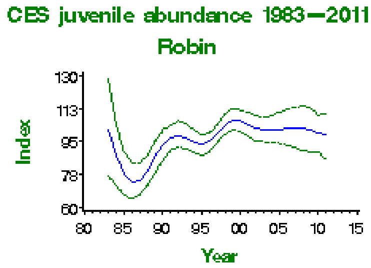
CBC/BBS UK graph



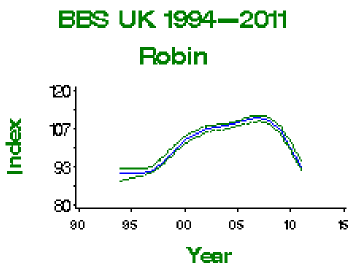
CBC/BBS England graph



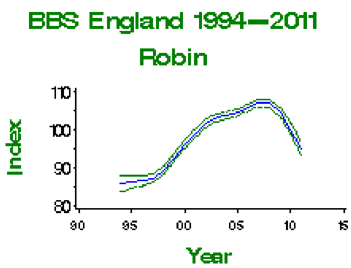
CES adults graph



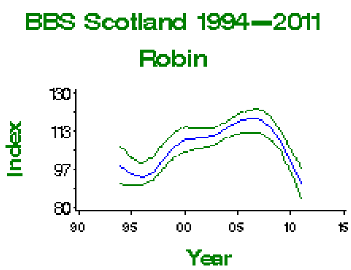
CES juveniles graph



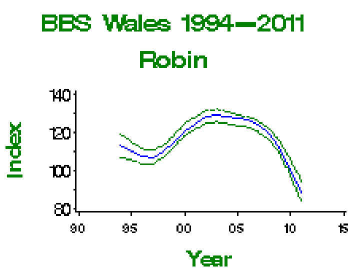
BBS UK graph



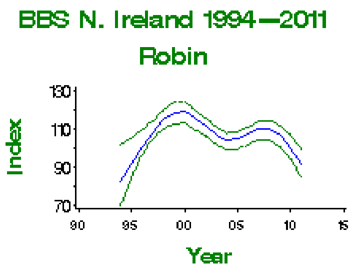
BBS England graph



BBS Scotland graph

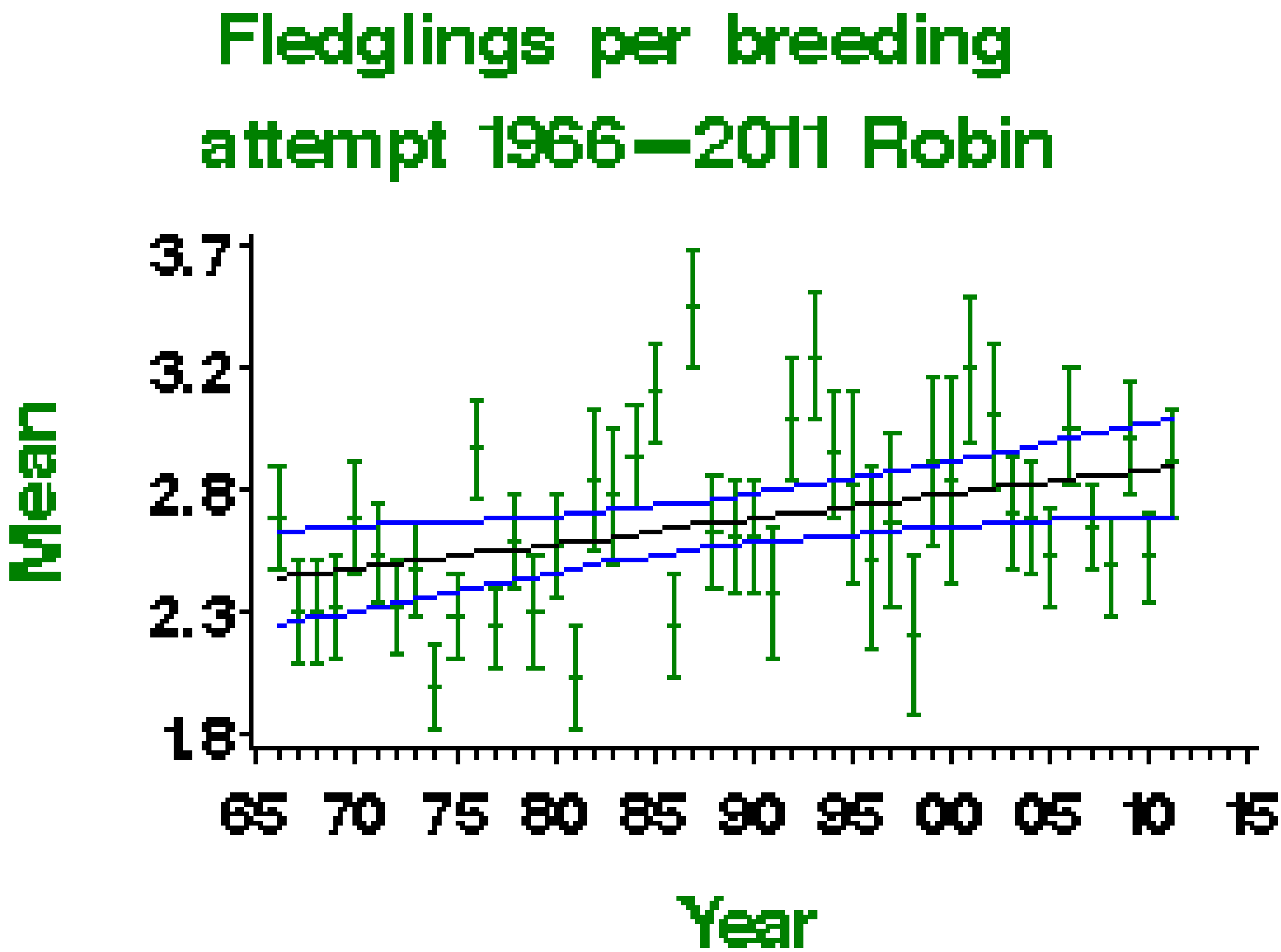


BBS Wales graph

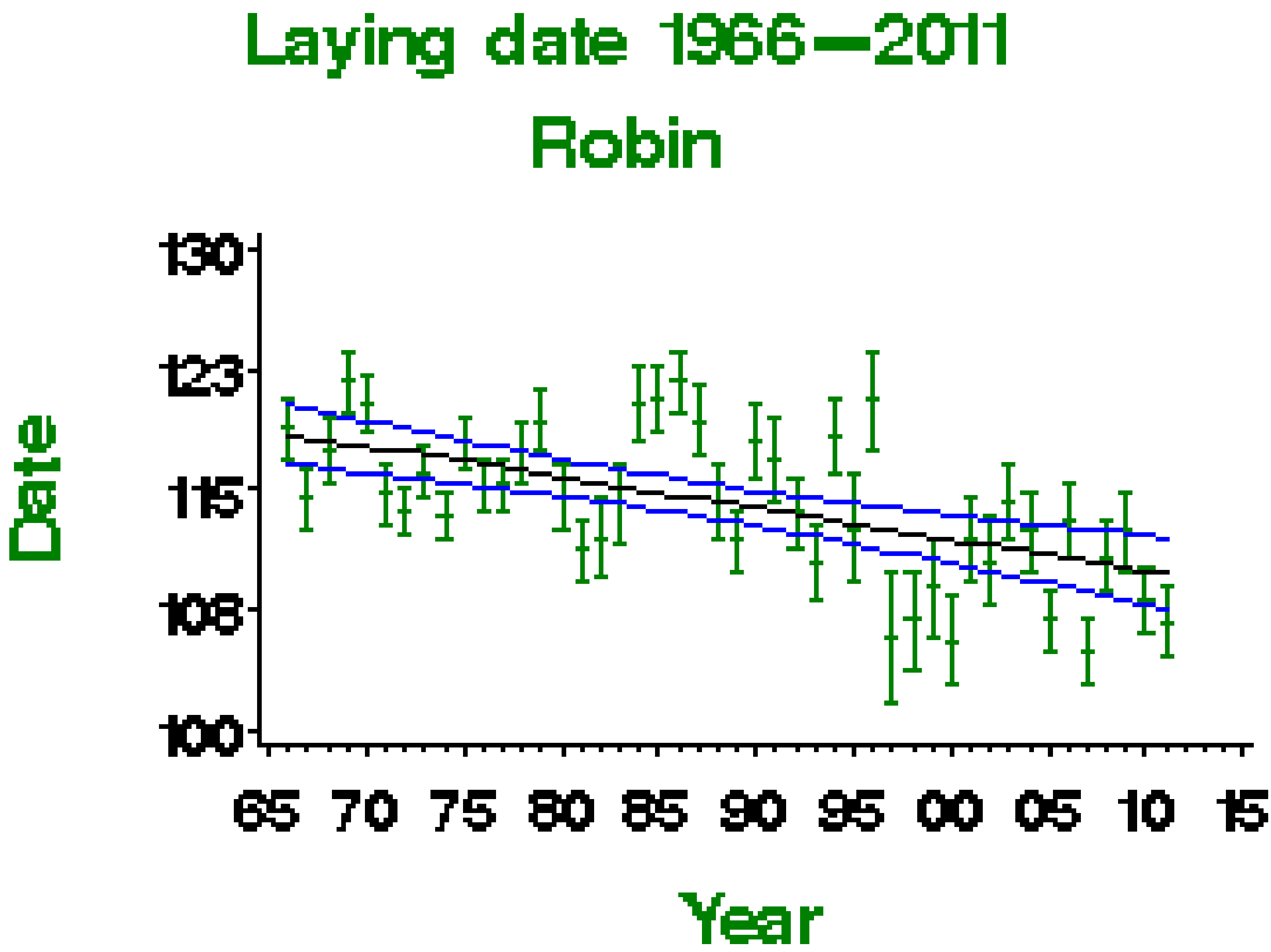


BBS N.Ireland graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend



Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

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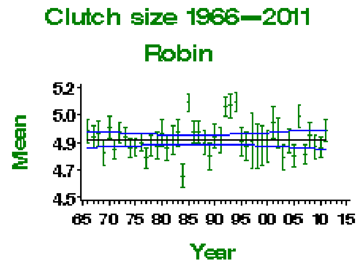
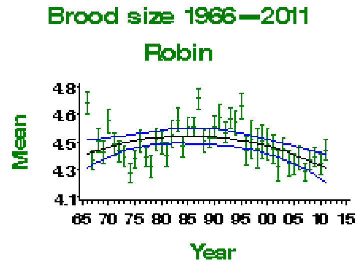
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	185	Linear increase	2.43 fledglings	2.83 fledglings	16.8%		
Clutch size	42	1968-2010	139	None					
Brood size	42	1968-2010	204	Curvilinear	4.40 chicks	4.30 chicks	-2.1%		
Nest failure rate at egg stage	42	1968-2010	202	Curvilinear	2.47% nests/day	1.38% nests/day	-44.1%		
Nest failure rate at chick stage	42	1968-2010	187	None					
Laying date	42	1968-2010	132	Linear decline	Apr 28	Apr 20	-8 days		
Juvenile to Adult ratio (CES)	26	1984-2010	102	Smoothed trend	98 Index value	100 Index value	2%		
Juvenile to Adult ratio (CES)	25	1985-2010	104	Smoothed trend	110 Index value	100 Index value	-9%		
Juvenile to Adult ratio (CES)	10	2000-2010	112	Smoothed trend	101 Index value	100 Index value	-1%		
Juvenile to Adult ratio (CES)	5	2005-2010	108	Smoothed trend	92 Index value	100 Index value	9%		

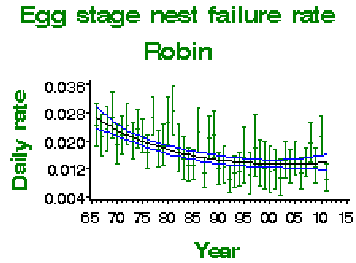
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



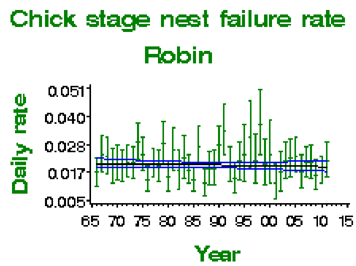
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



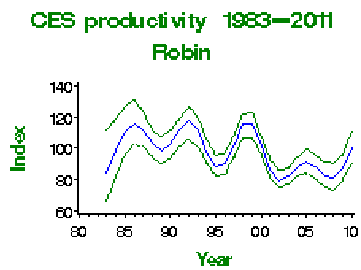
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



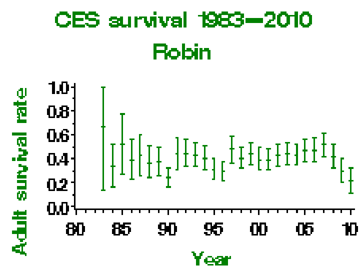
Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Smoothed long-term trend in ratio of juvenile:adult birds caught - green lines indicate 85% confidence limits



Proportion of adult birds surviving to following year - green bars represent 95% confidence limits

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Nightingale

Luscinia megarhynchos

Key facts

Conservation listings:	Europe: no SPEC category (concentrated in Europe, conservation status favourable) (BiE04) UK: amber (25-50% distribution decline) (BoCC3)
Long-term trend:	England: decline
Population size:	6,700 (5,600-9,400) males in 1999 (APEP13: Wilson et al. 2002)

Status summary

In 1999, the BTO organised a national survey of Nightingales, which showed a marked range contraction since the previous survey in 1980, but only an 8% overall population decline (Wilson et al. 2002; for more details Fuller et al. (2005) suggest the likely causes of Nightingale decline relate to pressures on migration and in winter, perhaps compounded by habitat loss in Britain. The increasing intensity of browsing by deer is known to be reducing habitat quality for this species (Gill & Fuller 2007, Holt et al. 2010). Though samples are too small to continue presenting a trend, CES suggested a sharp decline in productivity during the 1980s, perhaps because Nightingale nesting success may be adversely affected by cold and wet springs. Holt et al. (2012b) emphasise the value for Nightingale conservation of promoting habitat quality and researching breeding biology and migration/wintering areas. Woodland-scrub mosaics appear to be important breeding habitats, with implications for conservation practice at such sites (Holt et al. 2012c). Nightingale has been in moderate decline across Europe since 1980, though with little change since 1990 (PECBMS 2012a); this overall trend masks a marked contrast between severe decreases in southern and western Europe and increases in the east of the range (PECBMS 2007).

BTO is organising new Nightingale Surveys across Britain from 2012: for more details click here). Using a combination of daytime and night-time fieldwork, the 2012 survey investigates how many singing males are paired, as well as recording their current numbers and distribution.

Smoothed population index, relative to an arbitrary 100 in 2013, with 85% confidence limits in green

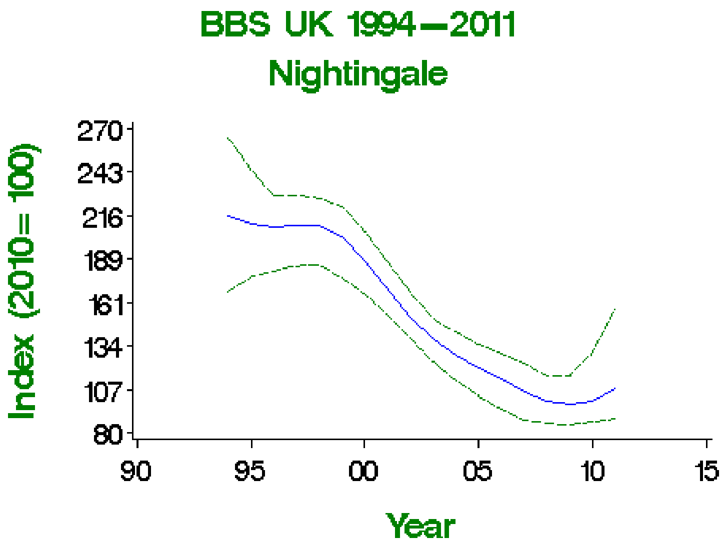
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	15	1995-2010	30	-52	-64	-26	>50	
	10	2000-2010	31	-47	-57	-26	>25	
	5	2005-2010	33	-17	-32	20		
BBS England	15	1995-2010	30	-49	-60	-25	>25	
	10	2000-2010	31	-46	-56	-24	>25	
	5	2005-2010	32	-15	-28	20		

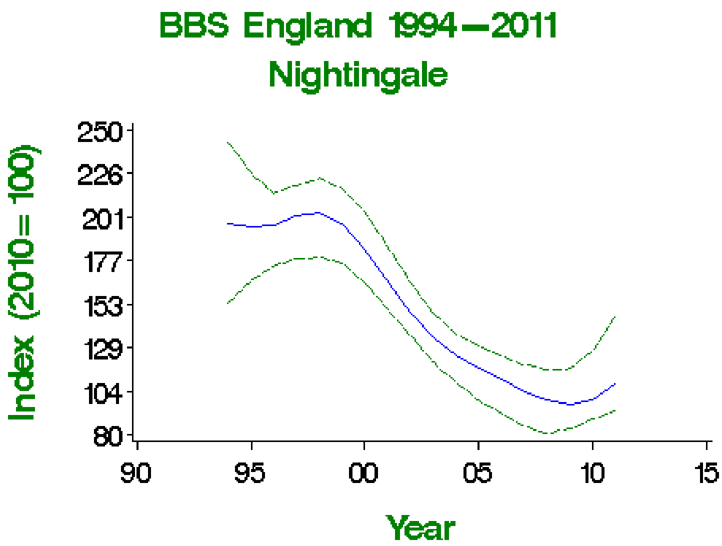
Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB

No CBC/BBS UK trend is available for this species. Smoothed CBC/BBS England trend graph



No long-term CBC/BBS trends available for this species. Smoothed BBS UK trend graph



No long-term CBC/BBS trends available for this species. Smoothed BBS England trend graph

Demographic trends

Productivity and survival trends for this species are not currently produced by BTO

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Pied Flycatcher

Ficedula hypoleuca

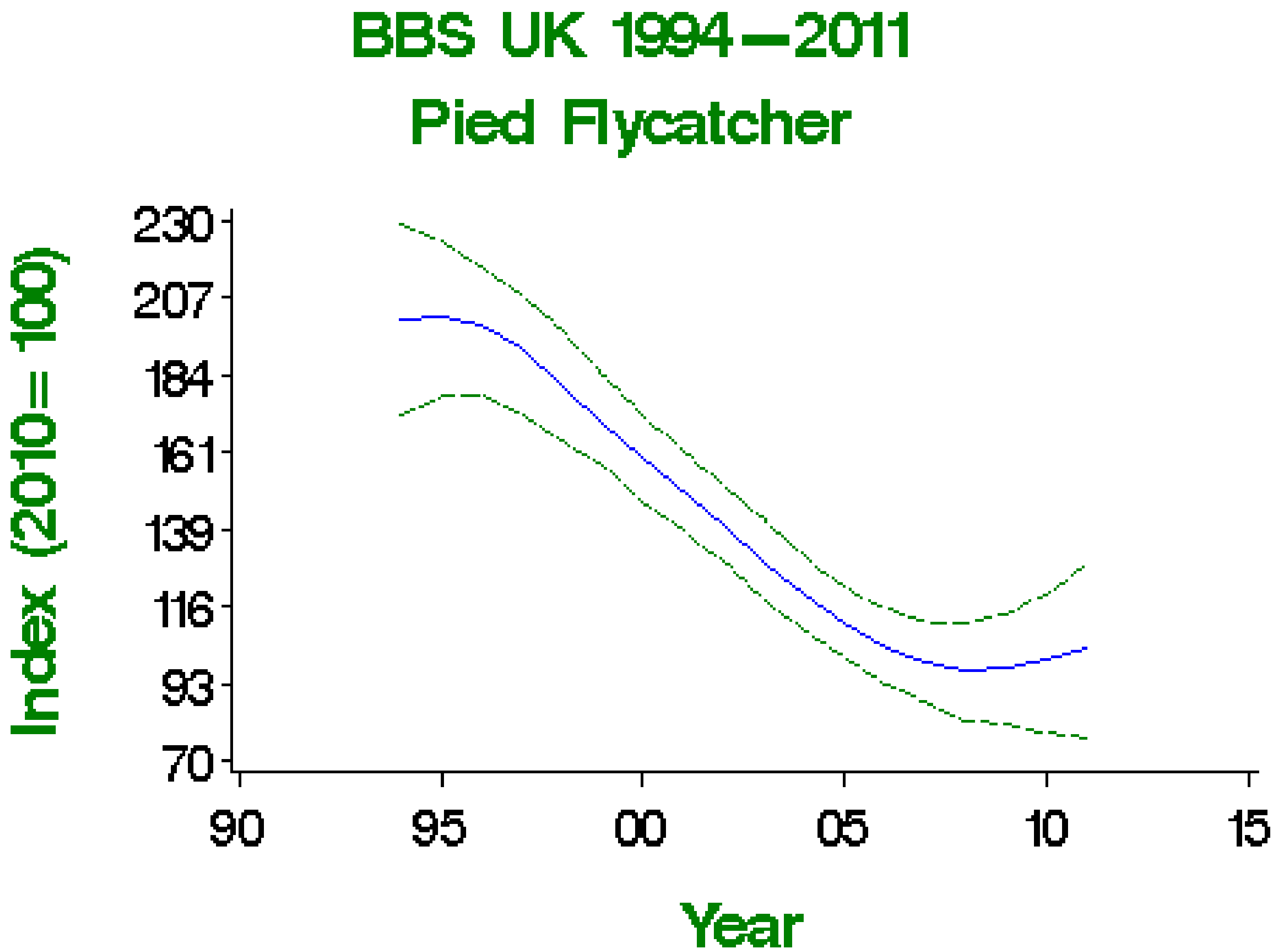
Key facts

Conservation listings:	Europe: no SPEC category (concentrated in Europe, conservation status favourable) (BiE04) UK: amber (25-50% decline) (BoCC3)
Long-term trend:	UK: decline
Population size:	17,000-20,000 pairs in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Migrant status:	Long-distance migrant
Nesting habitat:	Above-ground nester
Primary breeding habitat:	Woodland
Secondary breeding habitat:	
Breeding diet:	Animal
Winter diet:	Animal

Status summary

Pied Flycatchers are restricted to upland deciduous woods in parts of western and northern Britain. The proportions of CBC plots occupied rose during the 1980s, but the species was never numerous enough for trends to be estimated (Marchant et al. 1990). The 1988-91 breeding atlas revealed a small expansion in range from 1968-72, aided by the provision of nest boxes in new areas (Gibbons et al. 1993). BBS indicates, however, that abundance has decreased steeply since 1994, prompting the species' recent move from the green to the amber list. Percentage nestbox occupancy has also fallen over a similar period at a number of sites monitored as RAS projects. Numbers have shown widespread moderate decline across Europe since 1980 (PECBMS 2012a).



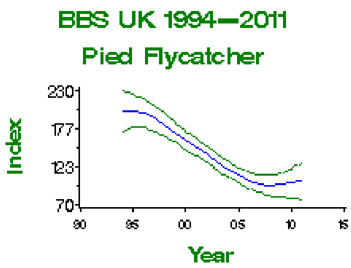
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	15	1995-2010	40	-50	-65	-32	>50	

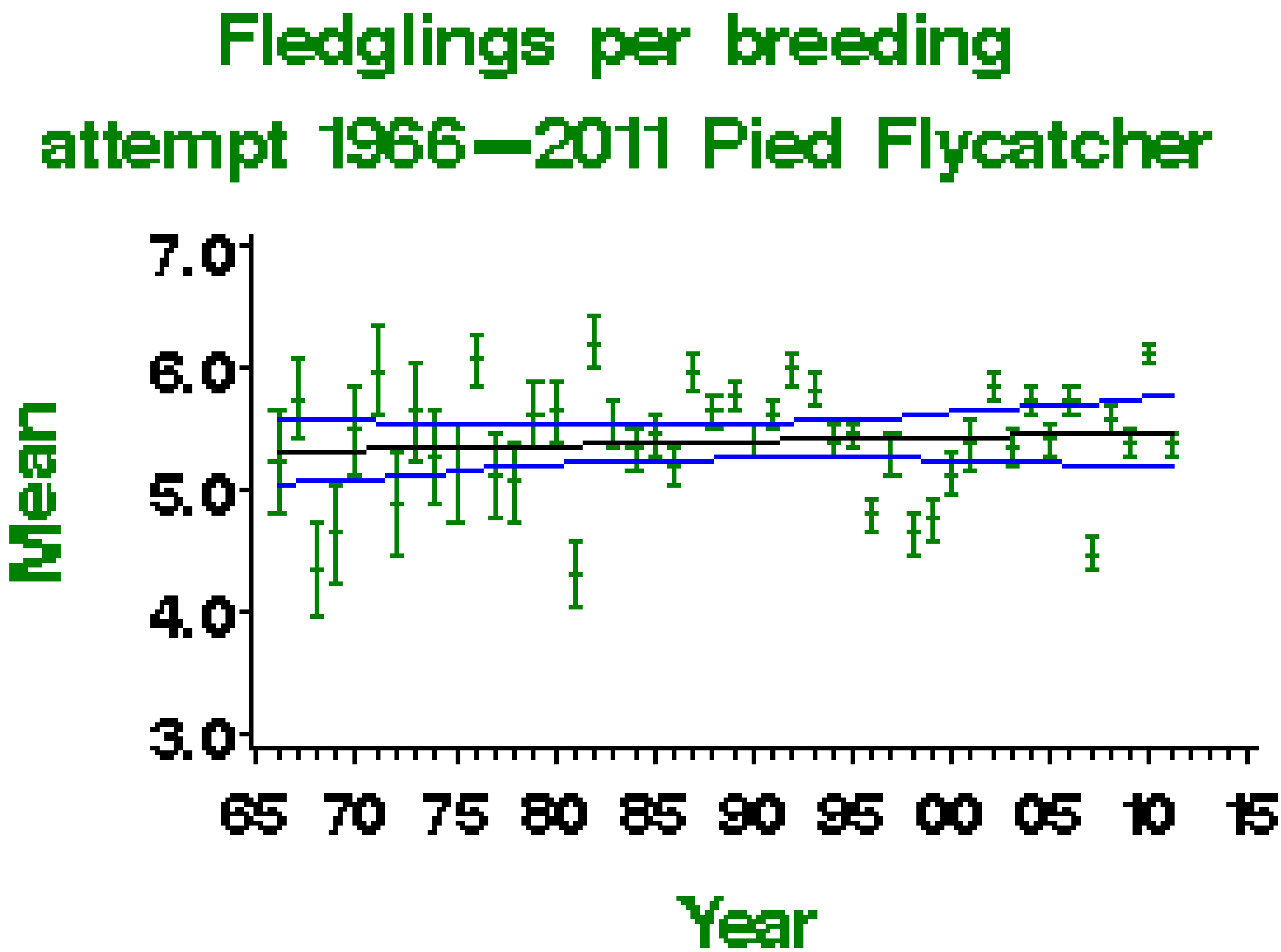
Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB

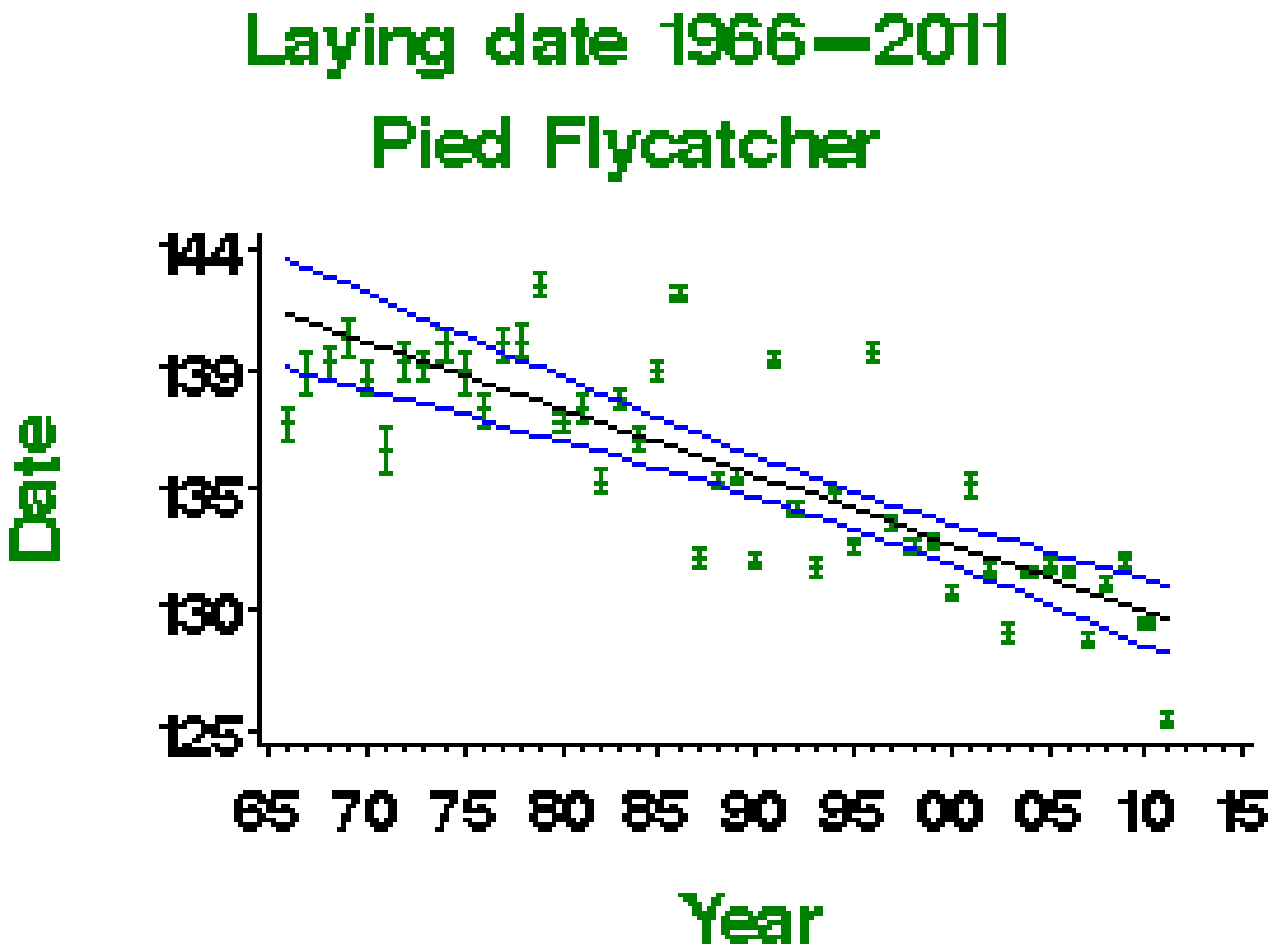


BBS UK graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

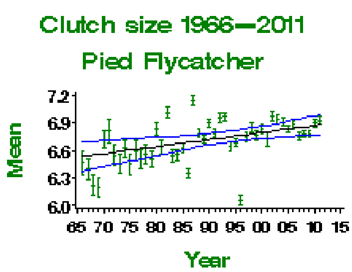


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

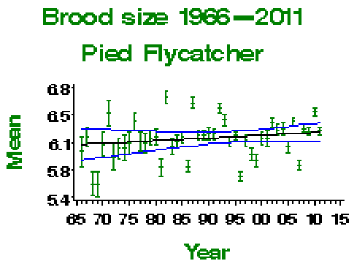
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	344	None					
Clutch size	42	1968-2010	348	Linear increase	6.55 eggs	6.88 eggs	4.9%		
Brood size	42	1968-2010	380	None					
Nest failure rate at egg stage	42	1968-2010	424	Curvilinear	0.59% nests/day	0.28% nests/day	-52.5%		
Nest failure rate at chick stage	42	1968-2010	347	Curvilinear	0.29% nests/day	0.57% nests/day	96.6%		
Laying date	42	1968-2010	430	Linear decline	May 21	May 10	-11 days		

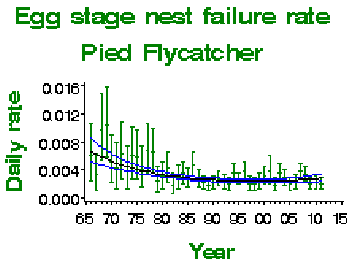
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



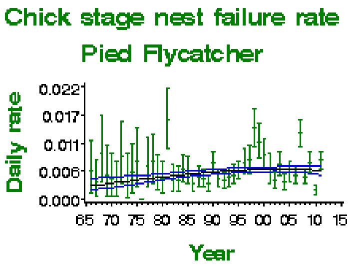
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



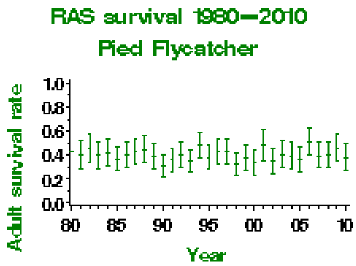
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of adult birds surviving to following year - error bars represent 95% confidence limits

Causes of change

The reasons for this decline are unknown, but there is good evidence that they lie at least partly outside the breeding season and are thought to be linked to changing conditions on wintering grounds and migration.

Change factor	Primary driver	Secondary driver
Demographic	Overwinter survival	
Ecological	Changes on wintering grounds	

Further information on causes of change

The reasons for this decline are unknown, but there is good evidence that they lie at least partly outside the breeding season (Goodenough et al. 2009). No trends are evident in the number of fledglings per breeding attempt (see above). There has been a linear increase in clutch size but although the failure rate at the egg stage has shown a decrease, failure rate at the chick stage has increased.

There is good evidence that declines are related to conditions outside the breeding season. Goodenough et al. (2009) found that decreasing breeding performance is contributing to decline, but that non-breeding factors are more important. Winter NAO index is a strong predictor of breeding population, probably because the North Atlantic oscillation influences food abundance in Africa and at migratory stopover points. Long-term autumn bird monitoring data from Russia was related to monthly mean temperatures in the West African wintering grounds; the positive relationship suggests that increasing bird numbers are explained by increasing mean November temperatures. Precipitation and European autumn, spring and breeding-range temperatures did not show a strong relationship (Chernetsov & Huettmann 2005). Thingstad et al. (2006) found that weather conditions at the flycatcher's wintering areas in western Africa were suspected to be responsible for the decrease in Scandinavia, although the breeding success of the sink populations was significantly correlated to June temperatures.

In the Netherlands, climate change may have brought about decline in Pied Flycatchers by advancing the peak period of food availability for this species in deciduous forests - the birds being unable to compensate for the change in food supply by breeding earlier (Both 2002, Both et al. 2006). A more recent paper found that timing of spring migration has responded flexibly to climate change as recovery dates during spring migration in North Africa advanced by ten days between 1980 and 2002, which was explained by improving Sahel rainfall and a phenotypic effect of birth date. However, there was no advance in arrival dates on the breeding grounds, most likely due to environmental constraints during migration (Both 2010). Futhermore, declines were found to be stronger in forests, as these were more seasonal habitats whereas less seasonal marshes showed less steep declines (Both et al. 2009).

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Redstart

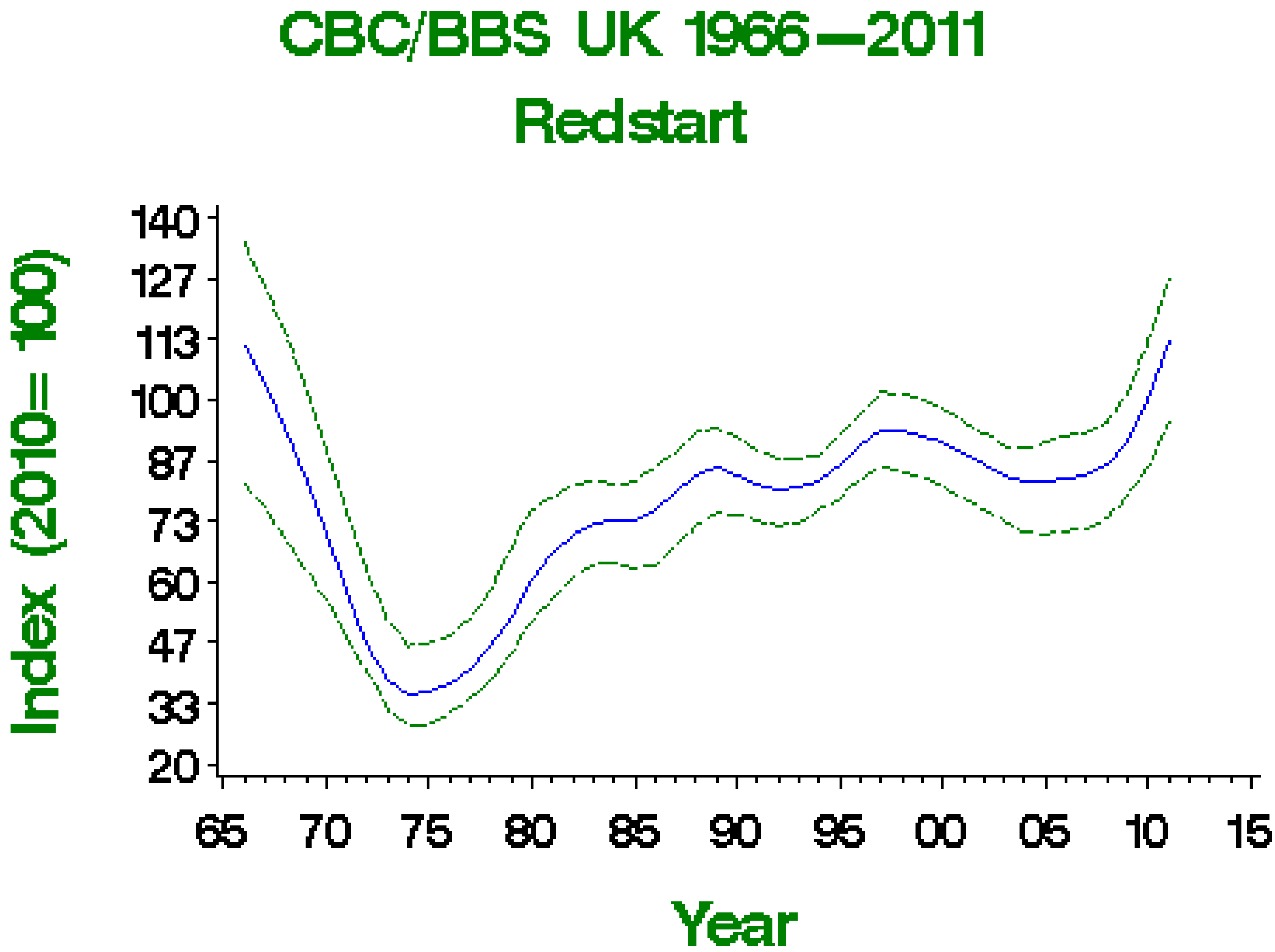
Phoenicurus phoenicurus

Key facts

Conservation listings:	Europe: SPEC category 2 (depleted) (BiE04) UK: amber (European status) (BoCC3)
Long-term trend:	UK, England: probable shallow decline
Population size:	100,000 (70,000-130,000) pairs in 2009 (APEP13: distance sampling estimate for 2006 (Newson et al. 2008) updated using BBS trend)

Status summary

The decline in the late 1960s and early 1970s was thought to be due to severe drought conditions in the Sahel wintering area in Africa (Marchant et al. 1990). There was a loss of range of 20% in Britain between 1968-72 and 1988-91, in terms of the numbers of occupied 10-km squares (Gibbons et al. 1993). A recovery in population size began in the mid 1970s and appears to have continued, at least in England, into the late 1990s. This increase has been associated with steeply improving numbers of fledglings per breeding attempt and progressively earlier laying dates. The trend towards earlier laying can be partly explained by recent climate change (Crick & Sparks 1999). There has been widespread moderate increase across Europe since 1980 (PECBMS 2012a).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

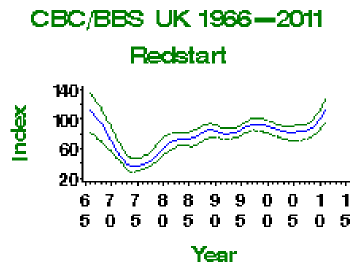
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	75	-4	-31	51		
	25	1985-2010	114	36	8	70		
	10	2000-2010	169	11	-2	24		
	5	2005-2010	188	22	10	39		

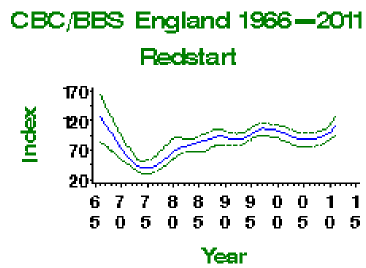
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	43	1967-2010	46	-12	-41	43		Small CBC sample
	25	1985-2010	67	21	-1	59		Small CBC sample
	10	2000-2010	97	-2	-14	12		
	5	2005-2010	112	14	-1	32		
BBS UK	15	1995-2010	157	19	4	33		
	10	2000-2010	167	11	0	21		
	5	2005-2010	188	22	11	36		
BBS England	15	1995-2010	89	5	-11	21		
	10	2000-2010	96	-1	-12	14		
	5	2005-2010	112	14	1	31		
BBS Wales	15	1995-2010	56	27	0	58		
	10	2000-2010	58	24	1	51		
	5	2005-2010	61	36	14	66		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

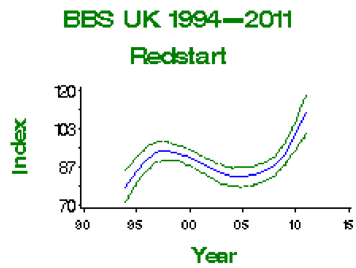
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



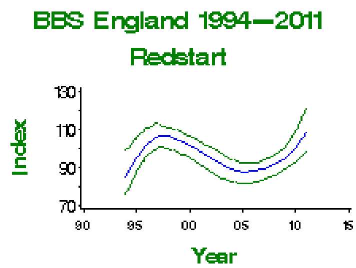
CBC/BBS UK graph



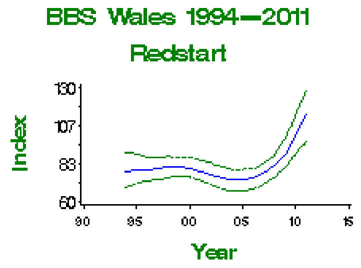
CBC/BBS England graph



BBS UK graph

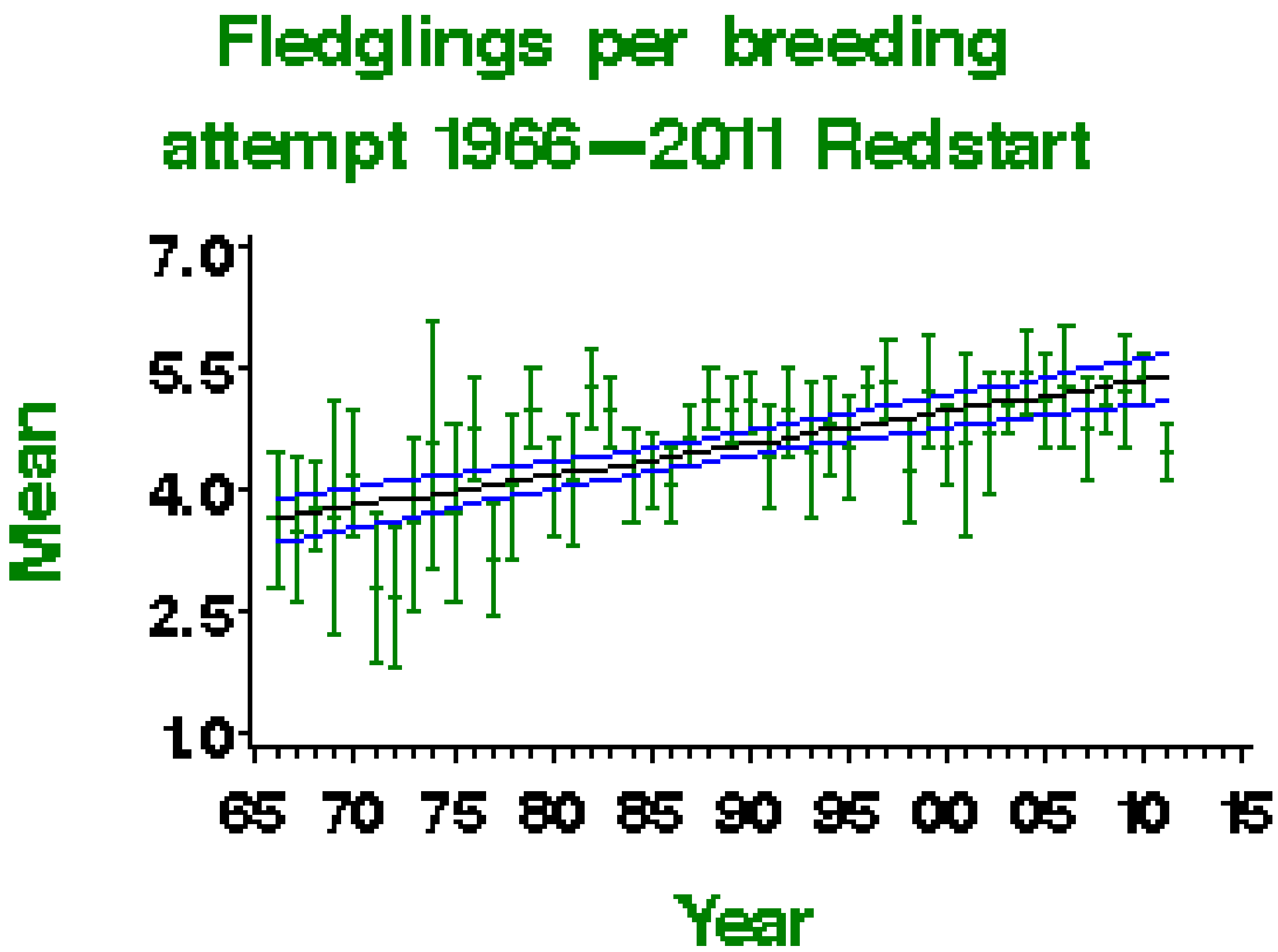


BBS England graph

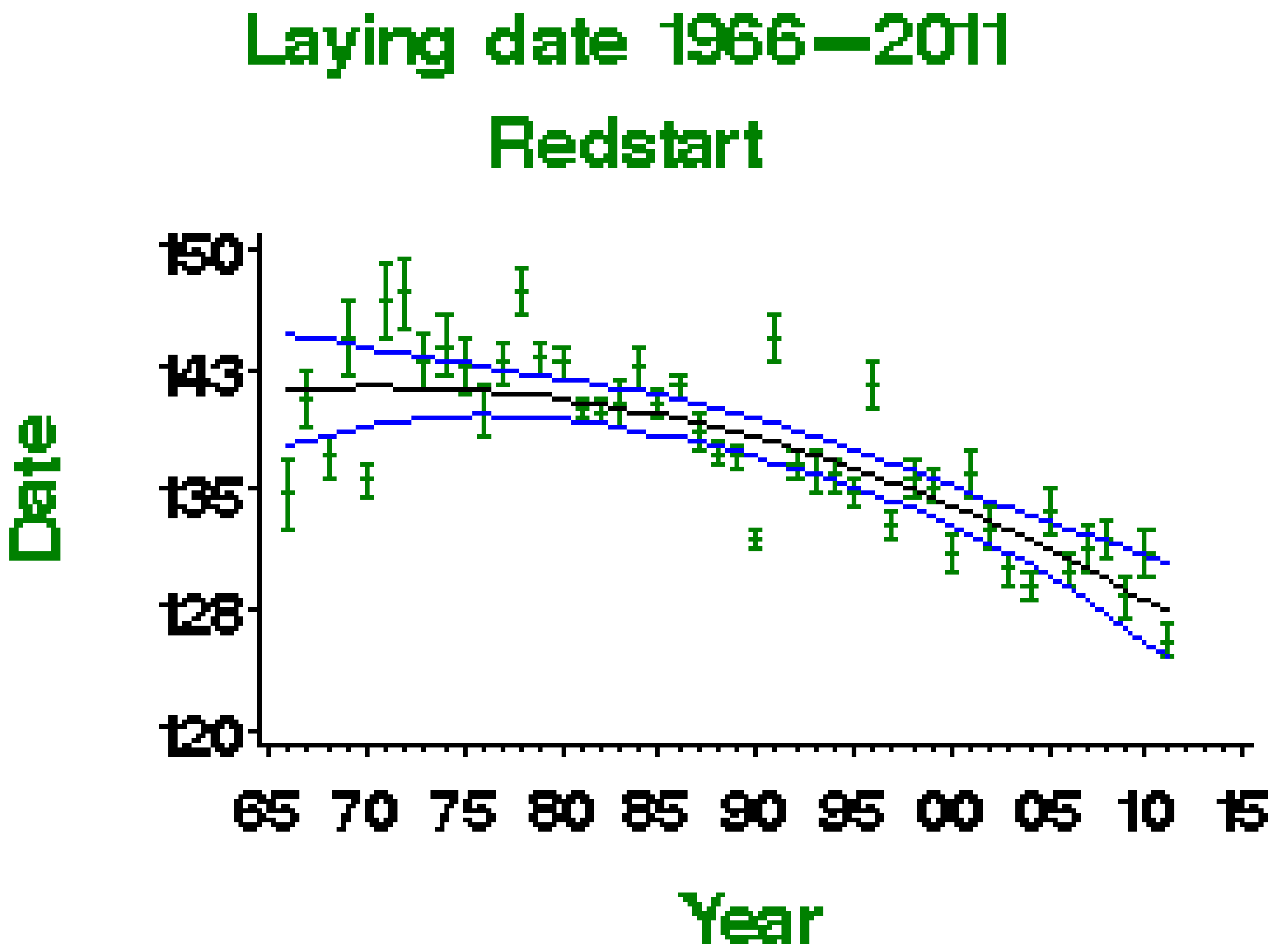


BBS Wales graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend



Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

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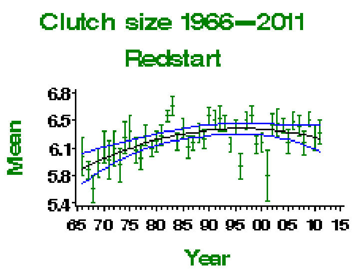
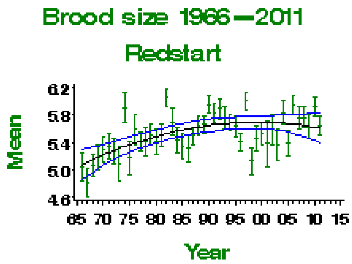
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	53	Linear increase	3.72 fledglings	5.37 fledglings	44.2%		
Clutch size	42	1968-2010	49	Curvilinear	5.91 eggs	6.24 eggs	5.6%		
Brood size	42	1968-2010	87	Curvilinear	5.15 chicks	5.63 chicks	9.3%		
Nest failure rate at egg stage	42	1968-2010	74	Curvilinear	1.30% nests/day	0.37% nests/day	-71.5%		
Nest failure rate at chick stage	42	1968-2010	53	Linear decline	1.27% nests/day	0.31% nests/day	-75.6%		
Laying date	42	1968-2010	63	Curvilinear	May 21	May 8	-13 days		

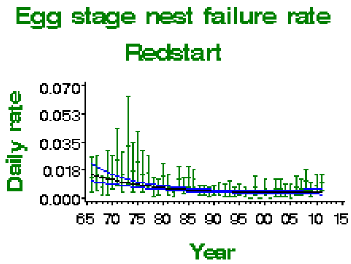
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



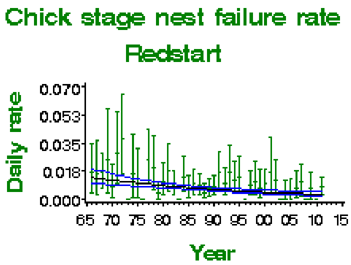
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

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This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

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Whinchat

Saxicola rubetra

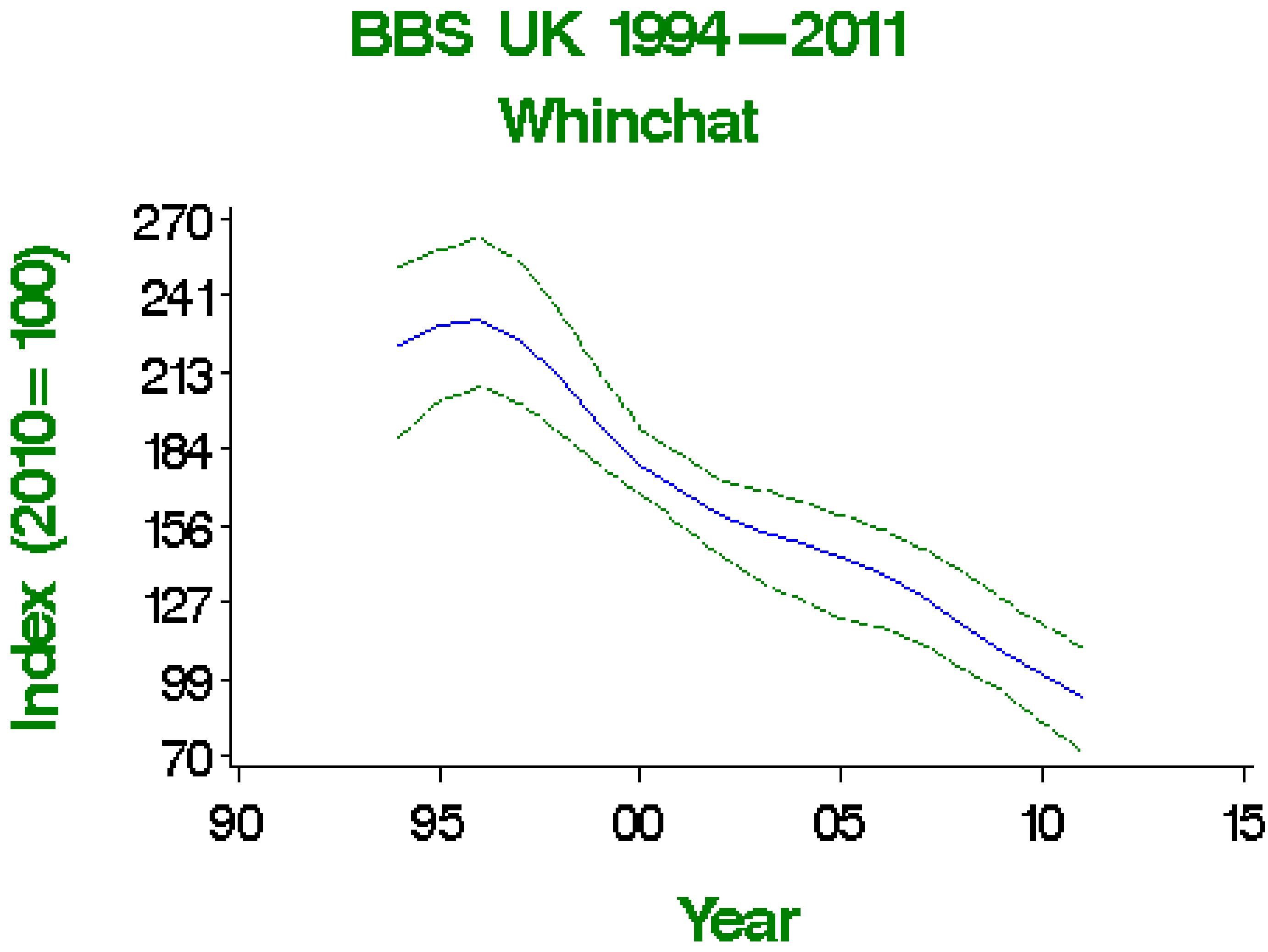
Key facts

Conservation listings:	Europe: no SPEC category (concentrated in Europe, conservation status favourable) (BiE04) UK: amber (25-50% decline) (BoCC3)
Long-term trend:	UK: decline
Population size:	47,000 (19,000-75,000) pairs in 2009 (APEP13: distance sampling estimate for 2006 (Newson et al. 2008) updated using BBS trend)

Status summary

Whinchats were not monitored until the BBS began in 1994. By then, however, Gibbons et al. (1993) had already identified a major range contraction, mainly from lowland England, that was probably at least partly due to the loss of marginal farmland habitats (Marchant et al. 1990). Further extinctions have occurred since then among the remaining pockets of lowland breeders. In the uplands, Whinchat habitat is somewhat restricted, being sandwiched between intensive agriculture at lower levels and higher land unsuitable for breeding, and limited also by aspect (Calladine & Bray 2012). BBS data indicate that further strong population decline have taken place since the 1990s, raising BTO alerts for the UK as a whole as well as for England. Nest record samples are small, but indicate substantial recent rises in nest losses at the egg and chick stages, which are of NRS concern (Leech & Barimore 2008). Whinchats have shown moderate decline across Europe since 1980, though with little change since 1990 (PECBMS 2012a). On the strength of its UK decline, Whinchat has recently been moved from the green to the amber list of conservation concern (Eaton et al. 2009).

In 2012, BTO conducted a survey of Whinchats, Stonechats and Wheatears in sample 1-km squares in Wales. The survey will estimate breeding numbers and distribution and record habitat choice by territorial males.



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

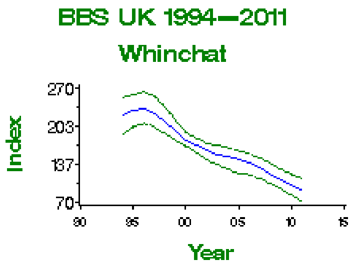
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	15	1995-2010	77	-57	-69	-42	>50	

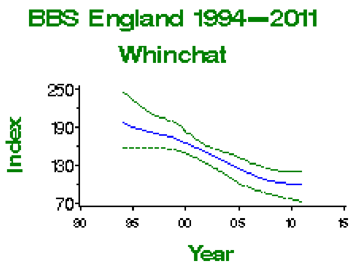
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	10	2000-2010	72	-44	-57	-30	>25	
	5	2005-2010	79	-30	-44	-15	>25	
BBS England	15	1995-2010	33	-47	-68	-21	>25	
	10	2000-2010	33	-39	-59	-24	>25	
	5	2005-2010	38	-19	-37	-1		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB

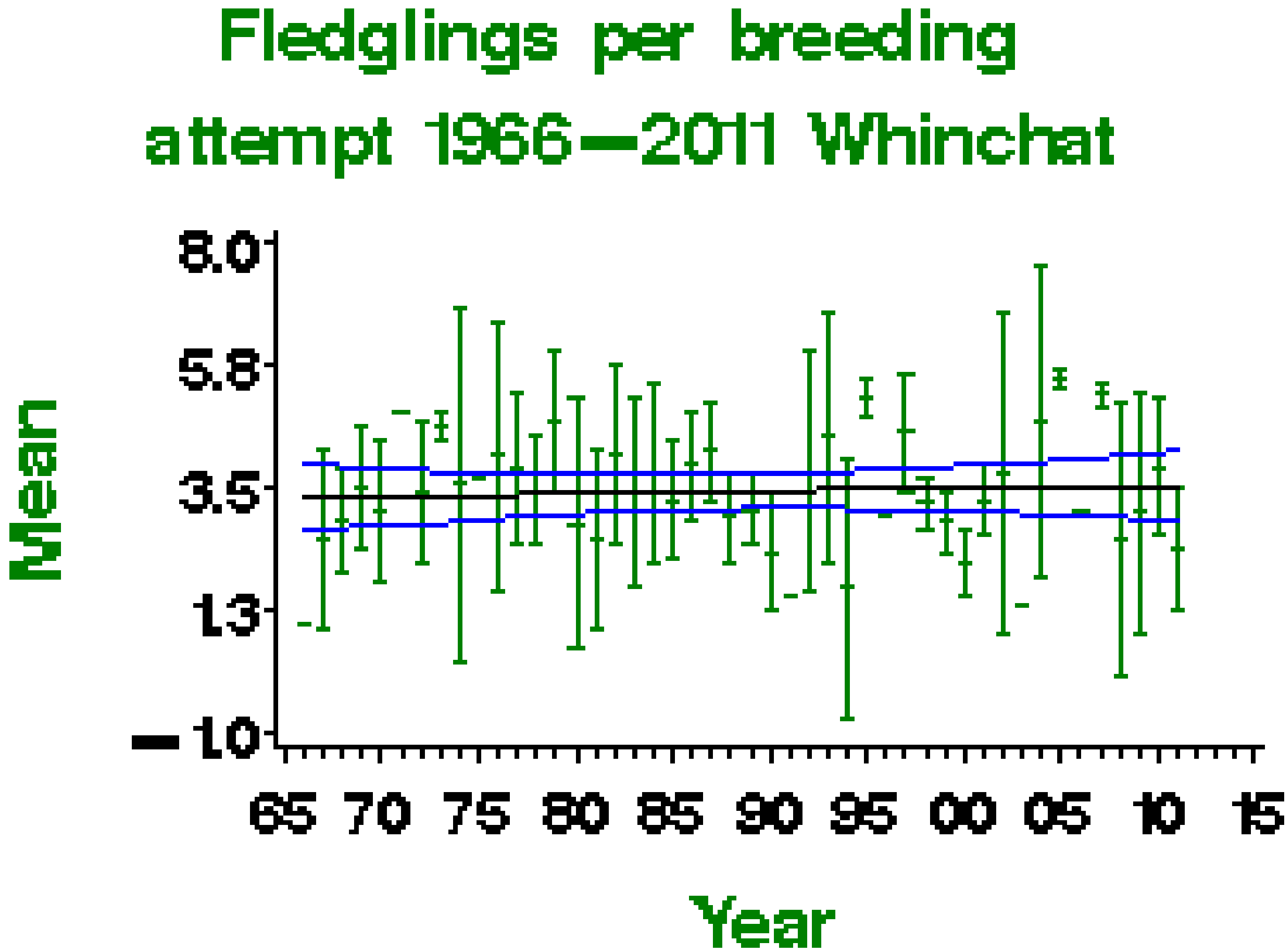


BBS UK graph

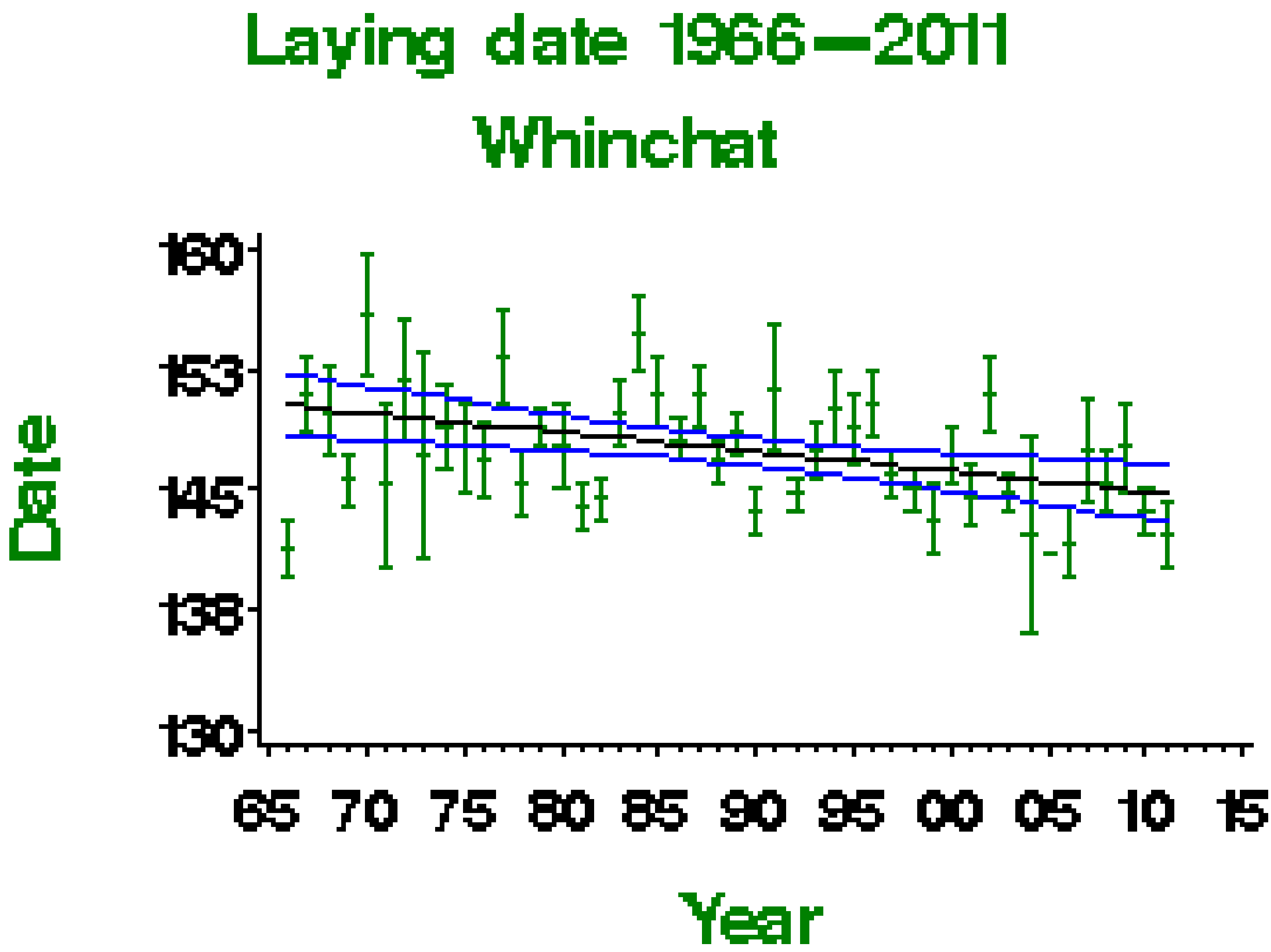


BBS England graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

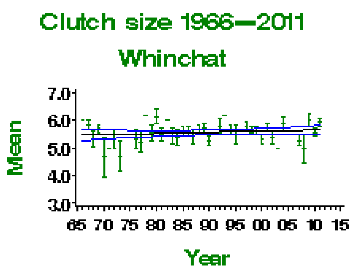


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

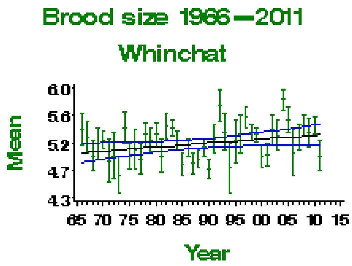
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	14	None					
Clutch size	42	1968-2010	12	None					Small sample
Brood size	42	1968-2010	37	Linear increase	5.02 chicks	5.28 chicks	5.2%		
Nest failure rate at egg stage	42	1968-2010	14	None					Small sample
Nest failure rate at chick stage	42	1968-2010	26	None					Small sample
Laying date	42	1968-2010	27	Linear decline	May 30	May 25	-5 days		Small sample

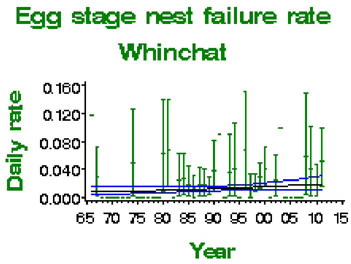
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



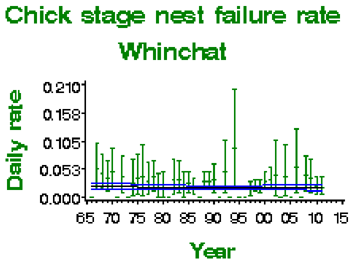
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

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Stonechat

Saxicola rubicola

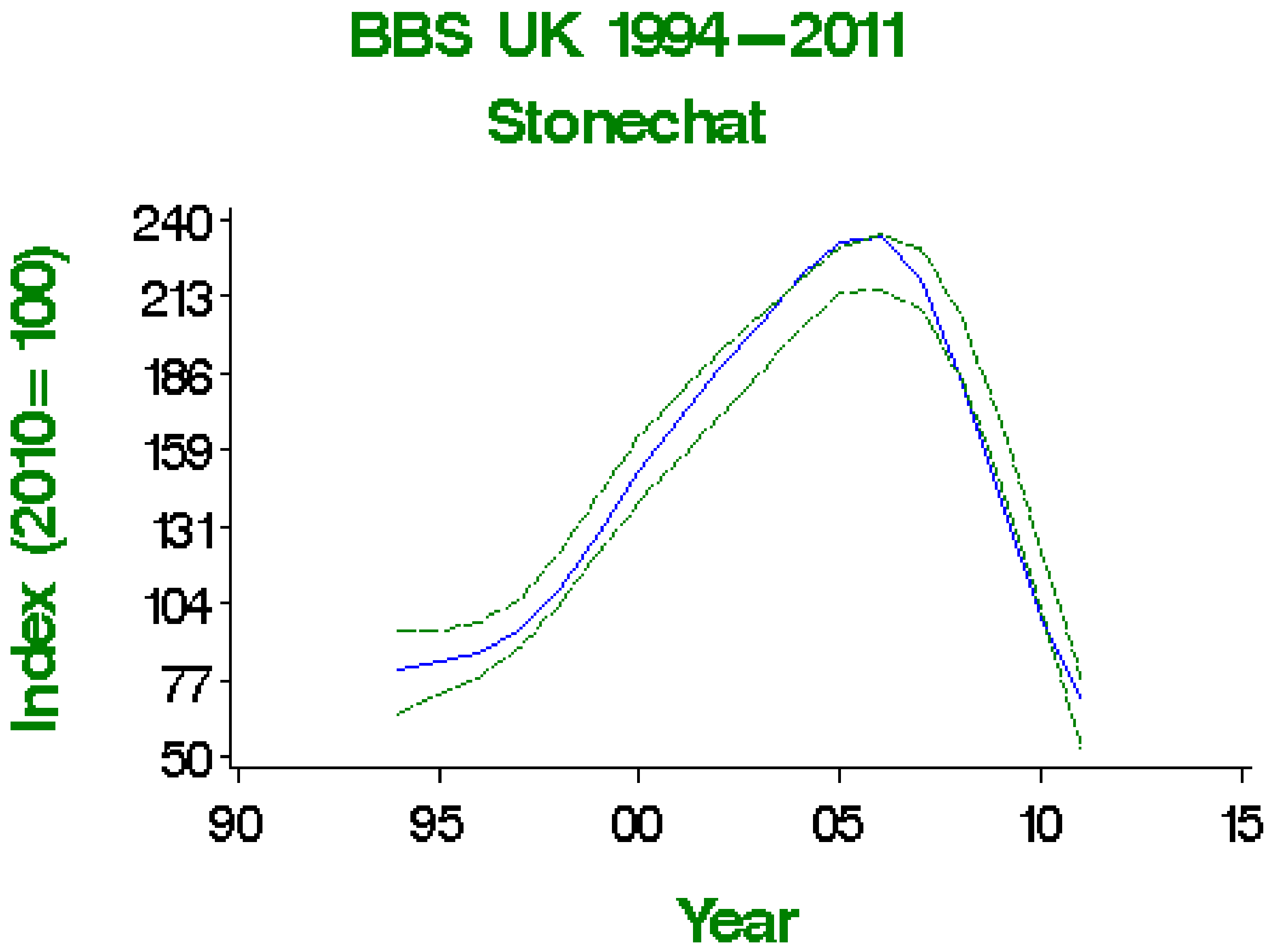
Key facts

Conservation listings:	Europe: no SPEC category (favourable conservation status in Europe, not concentrated in Europe) (BiE04) UK: green (BoCC3)
Long-term trend:	UK: probably fluctuating, with no long-term trend
Population size:	59,000 (39,000-79,000) pairs in 2009 (APEP13: distance sampling estimate for 2006 (Newson et al. 2008) updated using BBS trend)

Status summary

Trends were poorly quantified before the start of the BBS, but a long-term decline is suspected: severe winter weather, and loss and fragmentation of suitable breeding habitat in many inland regions, are believed to have reduced the population from the 1940s onward (Marchant et al. 1990). Breeding atlas data showed a substantial contraction in the Stonechat's range between the early 1970s and late 1980s (Gibbons et al. 1993). Nest failure rates have fallen markedly over the long term, and the numbers of fledglings per breeding attempt have risen steeply. Against this background, the strongly increasing BBS trend to 2006 represents substantial and possibly even complete recovery. Following similar increases widely across Europe, the species is now provisionally categorised as 'secure' (BirdLife International 2004) and consequently the species has recently been moved from the amber to the green list in the UK (Eaton et al. 2009). A strong increase has been recorded in the Republic of Ireland since 1998 (Crowe et al. 2010). UK data now indicate a sharp decrease, however, in response to recent snowy winters. There has been little change across Europe since 1990 and no longer-term trend is available (PECBMS 2012a).

In 2012, BTO conducted a survey of Whinchats, Stonechats and Wheatears in sample 1-km squares in Wales. The survey will estimate breeding numbers and distribution and record habitat choice by territorial males.



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

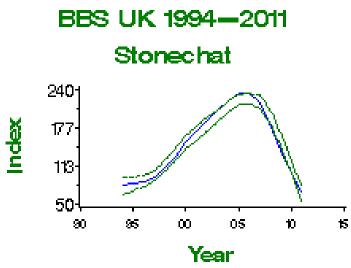
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	15	1995-2010	161	19	9	67		

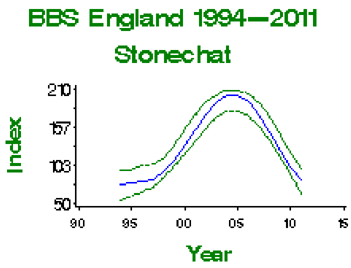
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	10	2000-2010	205	-34	-38	-12	>25	
	5	2005-2010	251	-57	-55	-43	>50	
BBS England	15	1995-2010	72	27	-6	100		
	10	2000-2010	94	-23	-41	-1		
	5	2005-2010	121	-50	-55	-36	>50	
BBS Scotland	15	1995-2010	36	-1	-7	100		
	10	2000-2010	44	-43	-41	-1	>25	
	5	2005-2010	54	-68	-62	-43	>50	
BBS Wales	15	1995-2010	36	106	17	202		
	10	2000-2010	45	-4	-31	34		
	5	2005-2010	49	-31	-43	-14	>25	

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

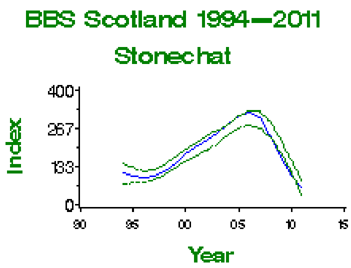
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



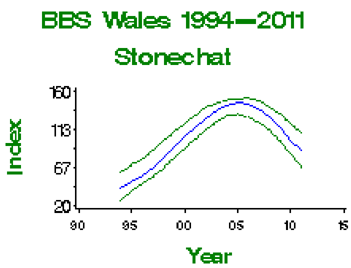
BBS UK graph



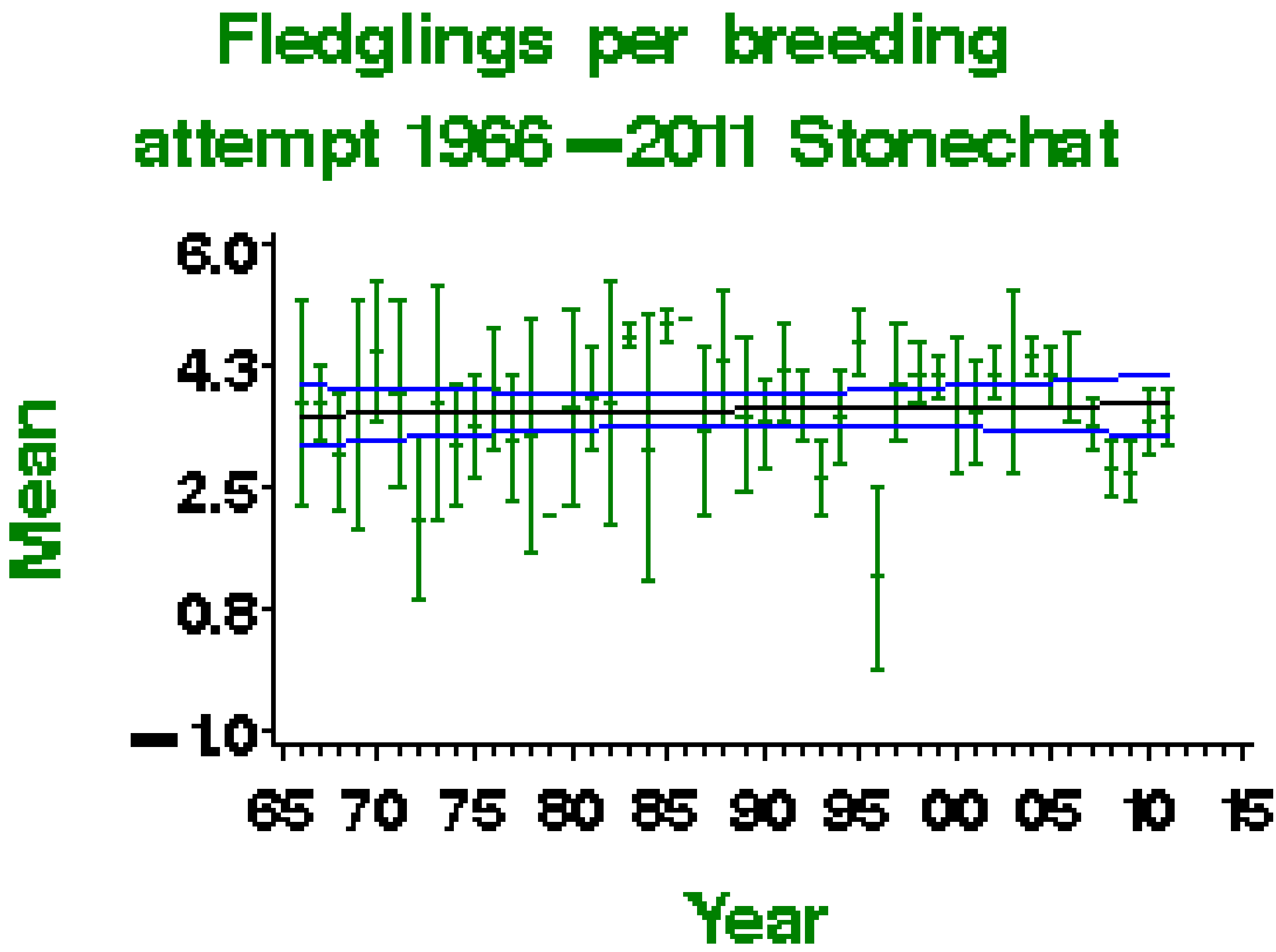
BBS England graph



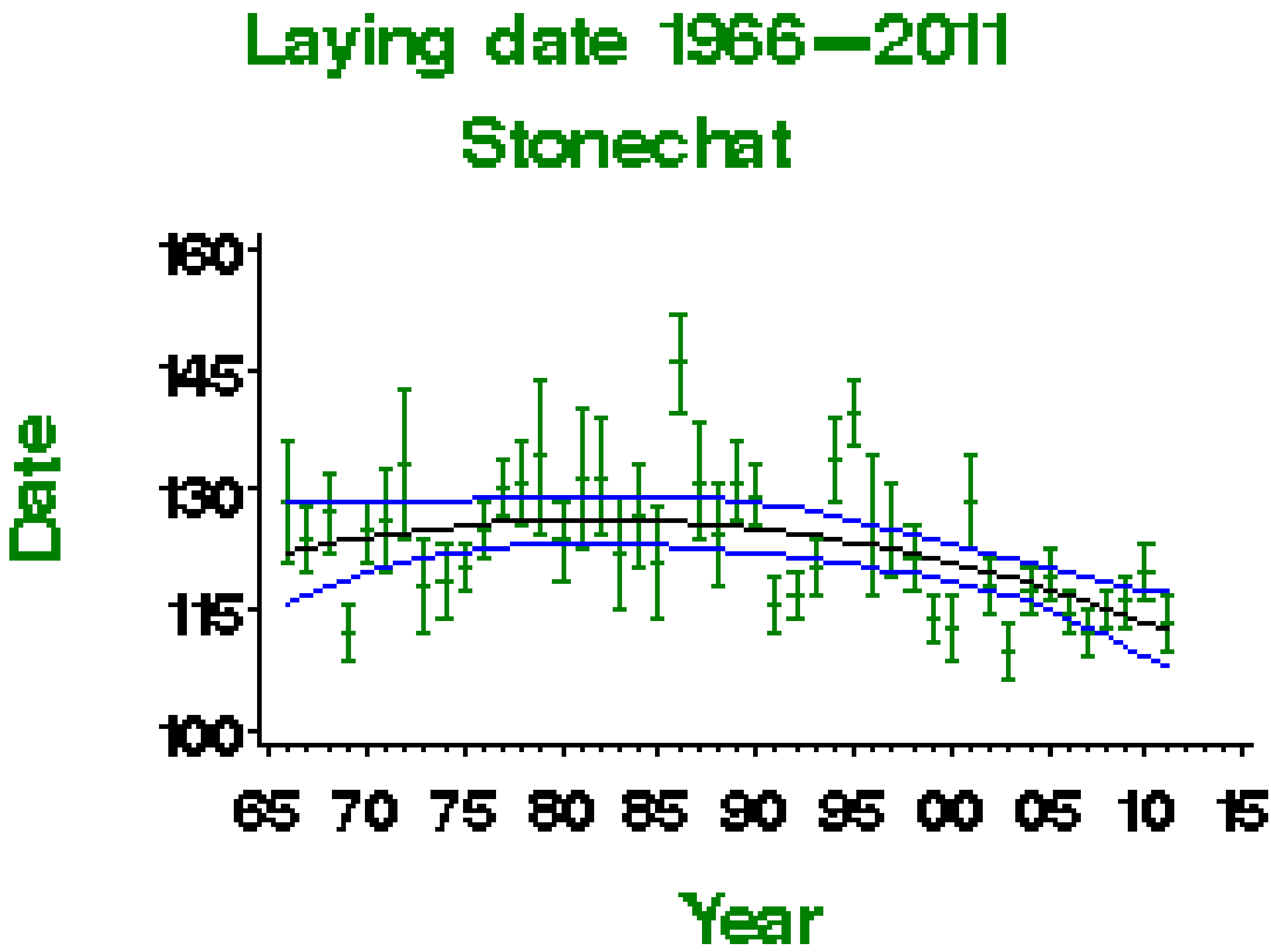
BBS Scotland graph



BBS Wales graph



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

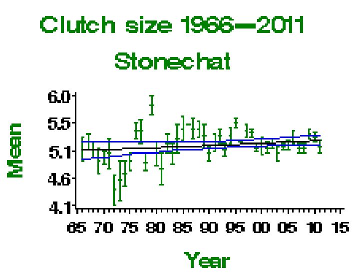


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

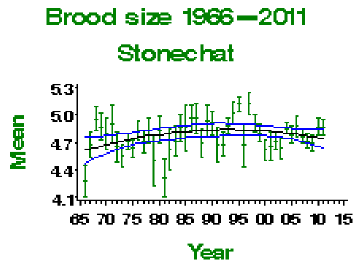
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	37	None					
Clutch size	42	1968-2010	33	None					
Brood size	42	1968-2010	66	Curvilinear	4.65 chicks	4.75 chicks	2.3%		
Nest failure rate at egg stage	42	1968-2010	37	None					
Nest failure rate at chick stage	42	1968-2010	60	Curvilinear	1.62% nests/day	1.33% nests/day	-17.9%		
Laying date	42	1968-2010	40	Curvilinear	May 3	Apr 24	-9 days		

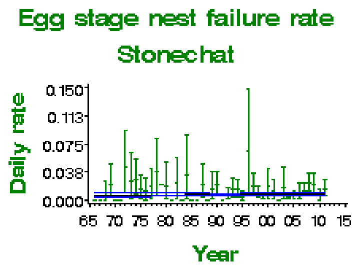
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



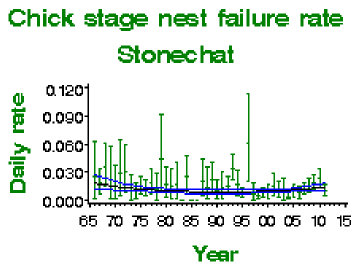
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



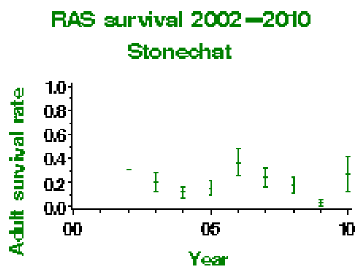
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of adult birds surviving to following year - error bars represent 95% confidence limits

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Wheatear

Oenanthe oenanthe

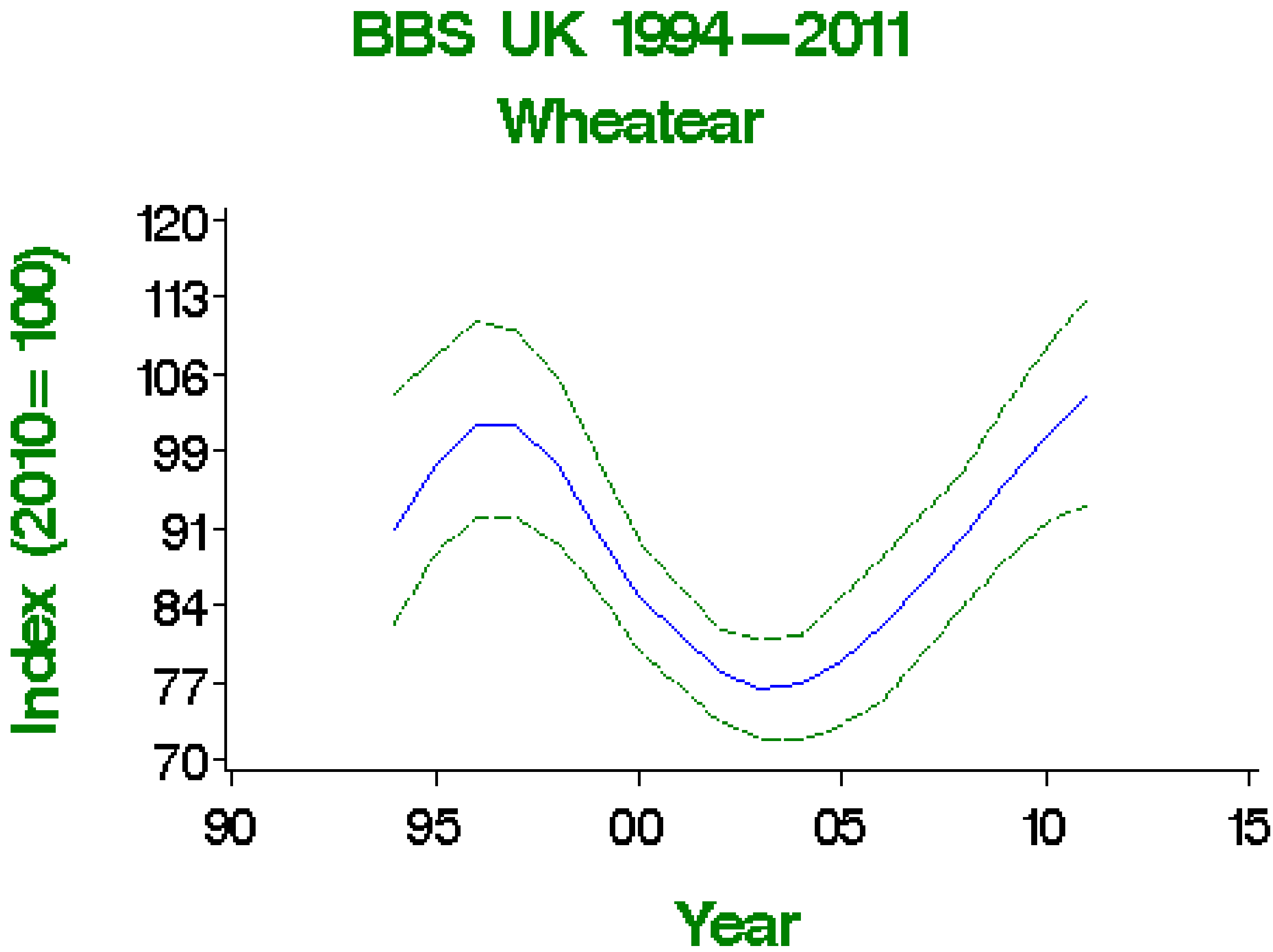
Key facts

Conservation listings:	Europe: SPEC category 3 (declining) (BiE04) UK: amber (species level and nominate race oenanthe, European status) (BoCC3)
Long-term trend:	UK: possible decline
Population size:	240,000 (170,000-310,000) pairs in 2009 (APEP13: distance sampling estimate for 2006 (Newson et al. 2008) updated using BBS trend)

Status summary

Although it is a common breeding species in many upland areas, the Wheatear was not monitored at the UK scale until the BBS began in 1994. Gibbons et al. (1993) had by then identified range contractions from lowland Britain since 1968-72, perhaps due to losses of suitable grassland and declines in rabbit abundance. BBS trends show wide fluctuations, with little indication of directional change. BBS data indicate that the estimates of UK population made for the 1988-91 Atlas may have been far too low, possibly by an order of magnitude (Gillings et al. 2007). Failure rates at the egg stage (18 days, comprising 14 days incubation and 4 days laying) have fallen substantially. Wheatear has shown moderate decline across Europe since 1980 (PECBMS 2012a). Following widespread declines during the 1990s, the European status of this species is no longer considered 'secure' (BirdLife International 2004). Accordingly, the species has recently been moved from the green to the amber list in the UK (Eaton et al. 2009).

In 2012, BTO conducted a survey of Whinchats, Stonechats and Wheatears in sample 1-km squares in Wales. The survey will estimate breeding numbers and distribution and record habitat choice by territorial males.



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	15	1995-2010	321	3	-15	23		

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	10	2000-2010	354	17	-1	34		
	5	2005-2010	423	26	14	41		
BBS England	15	1995-2010	178	12	-11	38		
	10	2000-2010	205	19	-4	51		
	5	2005-2010	261	32	16	46		
BBS Scotland	15	1995-2010	78	6	-18	44		
	10	2000-2010	76	17	-8	49		
	5	2005-2010	85	23	5	47		
BBS Wales	15	1995-2010	52	-16	-35	6		
	10	2000-2010	57	2	-18	23		
	5	2005-2010	60	13	-6	40		

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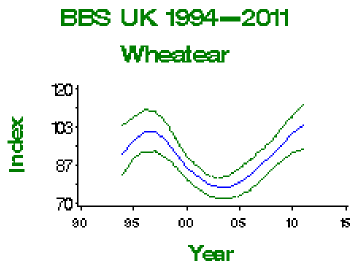
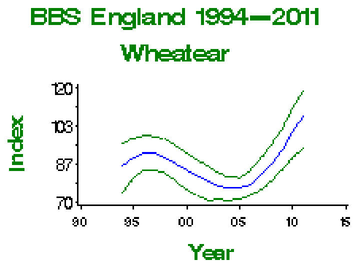
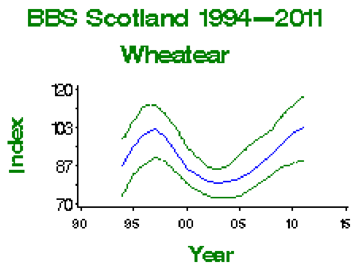


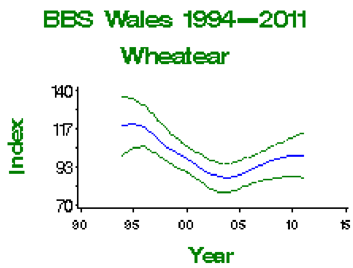
BBS UK graph



BBS England graph

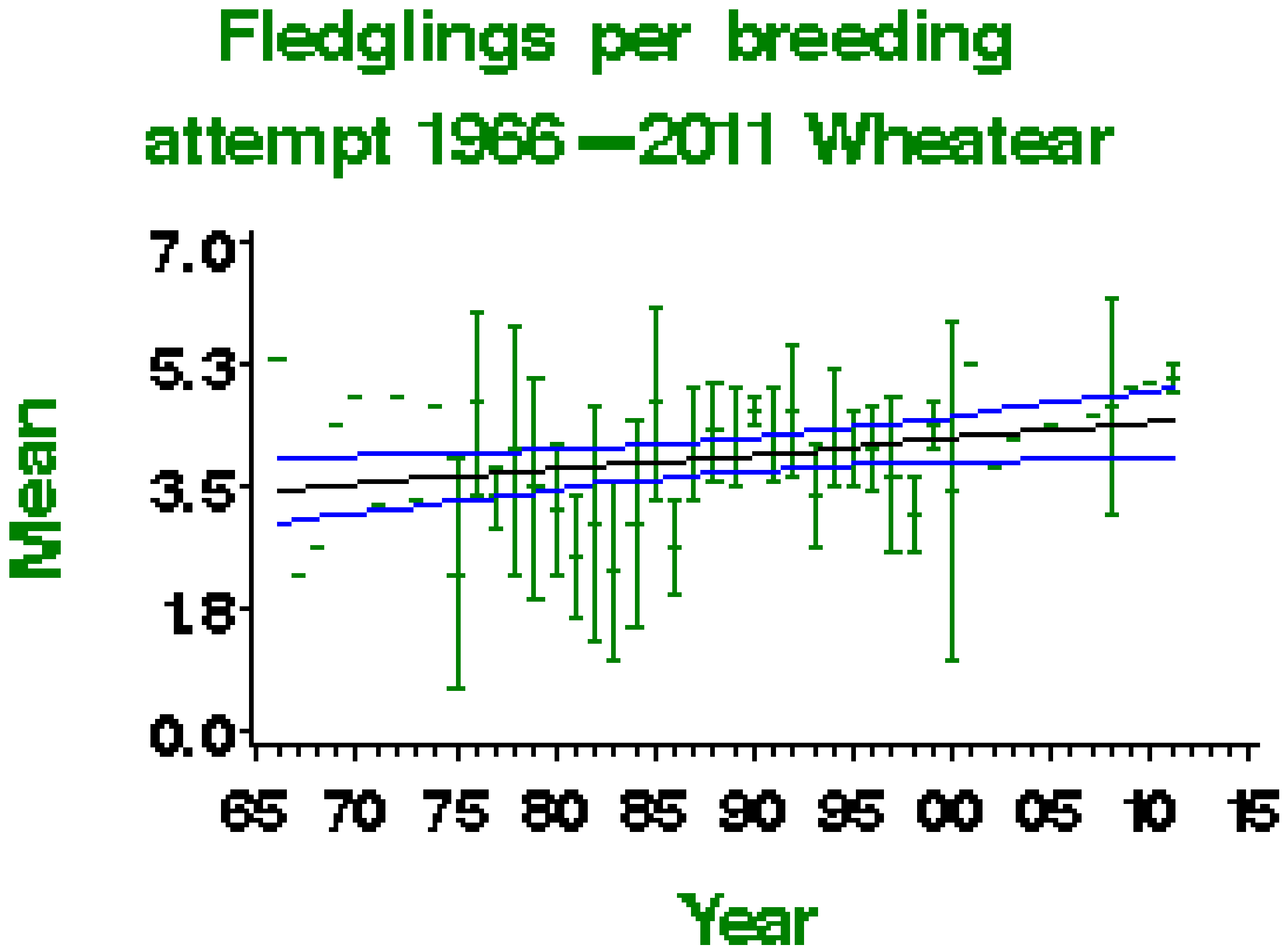


BBS Scotland graph

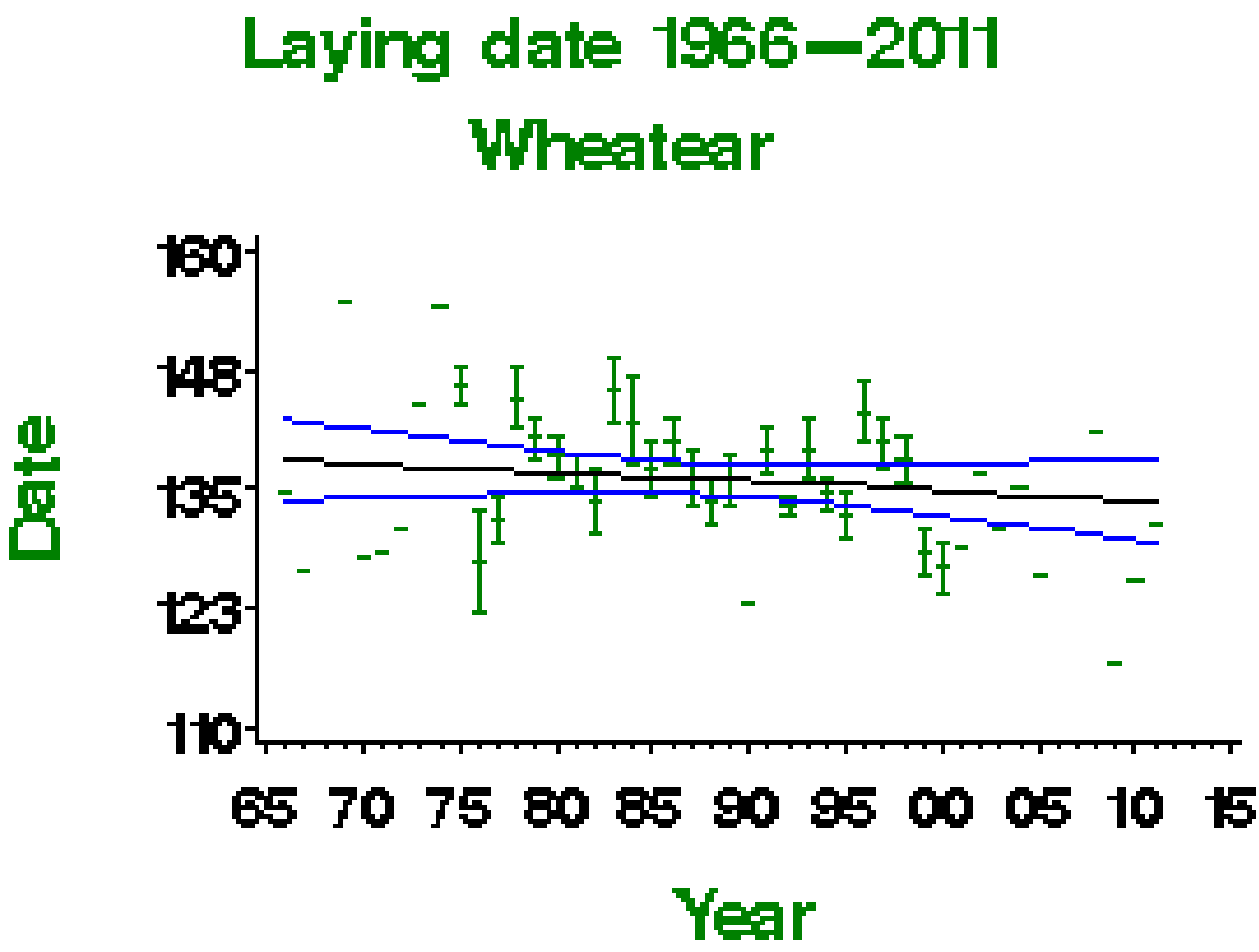


BBS Wales graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

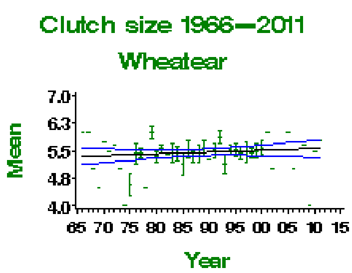


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

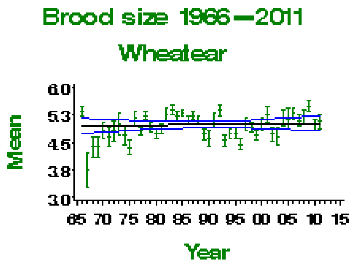
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	16	Linear increase	3.50 fledglings	4.42 fledglings	26.5%		
Clutch size	42	1968-2010	11	None					Small sample
Brood size	42	1968-2010	57	None					
Nest failure rate at egg stage	42	1968-2010	16	Curvilinear	0.79% nests/day	0.02% nests/day	-97.5%		Small sample
Nest failure rate at chick stage	42	1968-2010	38	None					
Laying date	42	1968-2010	12	None			0 days		Small sample

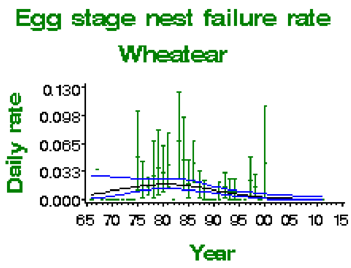
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



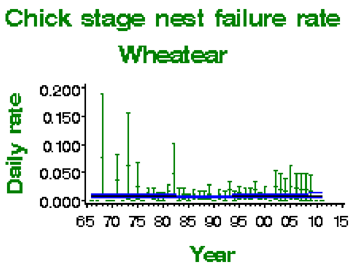
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



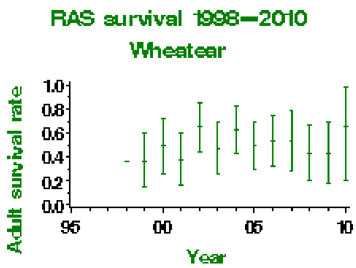
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of adult birds surviving to following year - error bars represent 95% confidence limits

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Dunnock

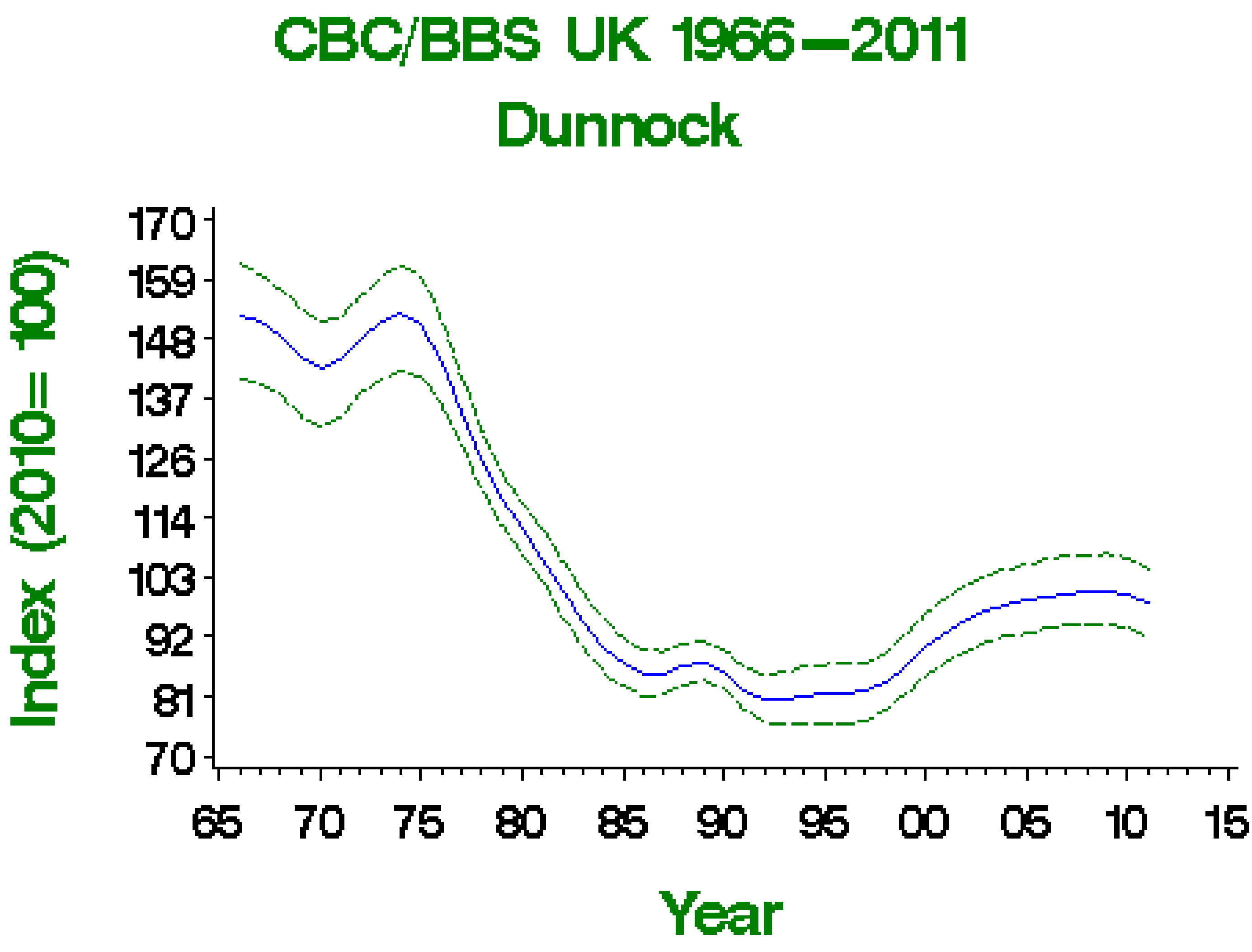
Prunella modularis

Key facts

Conservation listings:	Europe: no SPEC category (concentrated in Europe, conservation status favourable) (BiE04) UK: amber (species level, race *occidentalis*, 25-50% population decline; race *hebridium*, >20% of European breeders) (BoCC3) UK Biodiversity Action Plan: priority species
Long-term trend:	UK, England: moderate decline
Population size:	2.5 million territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Status summary

Dunnock abundance fell substantially between the mid 1970s and mid 1980s, after a period of population stability. Some recovery has occurred throughout the UK since the late 1990s, but the species is still amber listed. The BBS Fuller et al. 2005). There has been little variation in survival rates over time (Siriwardenaet al. 1998a). Clutch and brood sizes, and the number of fledglings per breeding attempt all increased as the population fell. Nest failure rates are currently increasing, and are of NRS concern (Leech & Barimore 2008). Numbers have shown widespread moderate decrease across Europe since 1980 (PECBMS 2012a).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

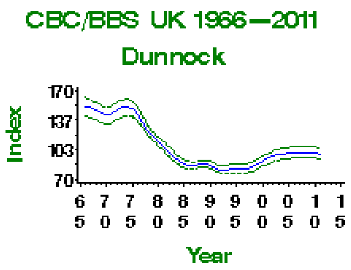
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	887	-34	-41	-22	>25	
	25	1985-2010	1370	15	4	29		
	10	2000-2010	2274	11	7	14		
	5	2005-2010	2575	1	-1	4		

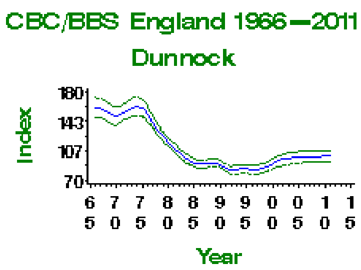
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	43	1967-2010	732	-37	-46	-27	>25	
	25	1985-2010	1125	9	4	22		
	10	2000-2010	1850	10	6	14		
	5	2005-2010	2106	2	-1	5		
CES adults	26	1984-2010	97	-19	-30	-6		
	25	1985-2010	100	-9	-21	6		
	10	2000-2010	107	-11	-19	-1		
	5	2005-2010	104	-15	-21	-7		
CES juveniles	26	1984-2010	95	-21	-46	21		
	25	1985-2010	97	-12	-35	24		
	10	2000-2010	104	-3	-16	15		
	5	2005-2010	100	-6	-18	7		
BBS UK	15	1995-2010	2013	22	17	28		
	10	2000-2010	2259	11	7	14		
	5	2005-2010	2575	1	-1	3		
BBS England	15	1995-2010	1627	17	12	22		
	10	2000-2010	1815	11	7	14		
	5	2005-2010	2069	1	-1	4		
BBS Scotland	15	1995-2010	139	56	31	87		
	10	2000-2010	156	23	8	39		
	5	2005-2010	184	8	-3	20		
BBS Wales	15	1995-2010	151	30	14	49		
	10	2000-2010	171	12	1	25		
	5	2005-2010	182	-5	-11	3		
BBS N.Ireland	15	1995-2010	69	68	14	106		
	10	2000-2010	82	-16	-25	1		
	5	2005-2010	88	-15	-21	-4		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

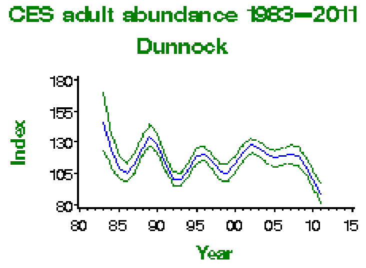
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



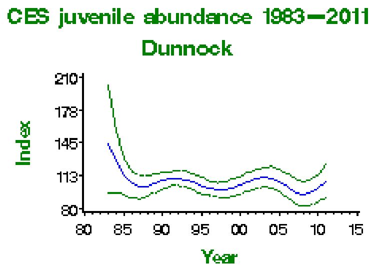
CBC/BBS UK graph



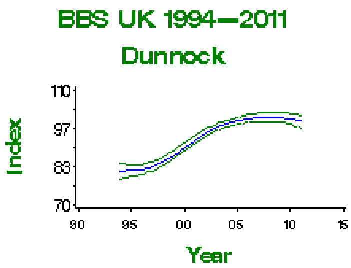
CBC/BBS England graph



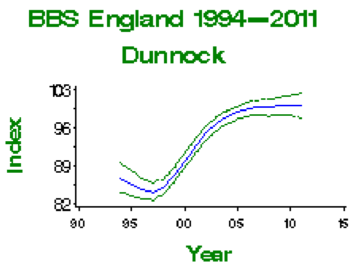
CES adults graph



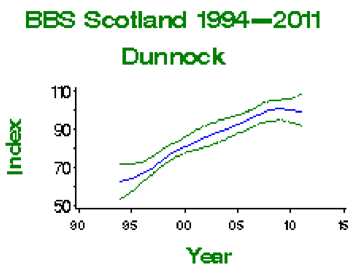
CES juveniles graph



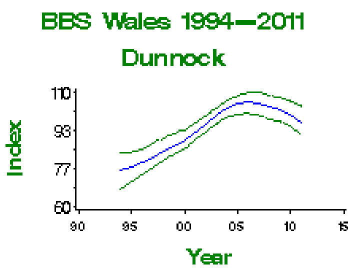
BBS UK graph



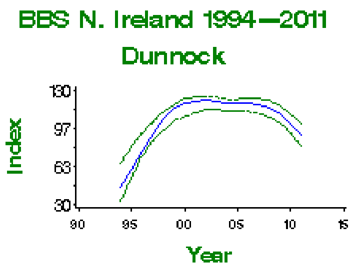
BBS England graph



BBS Scotland graph

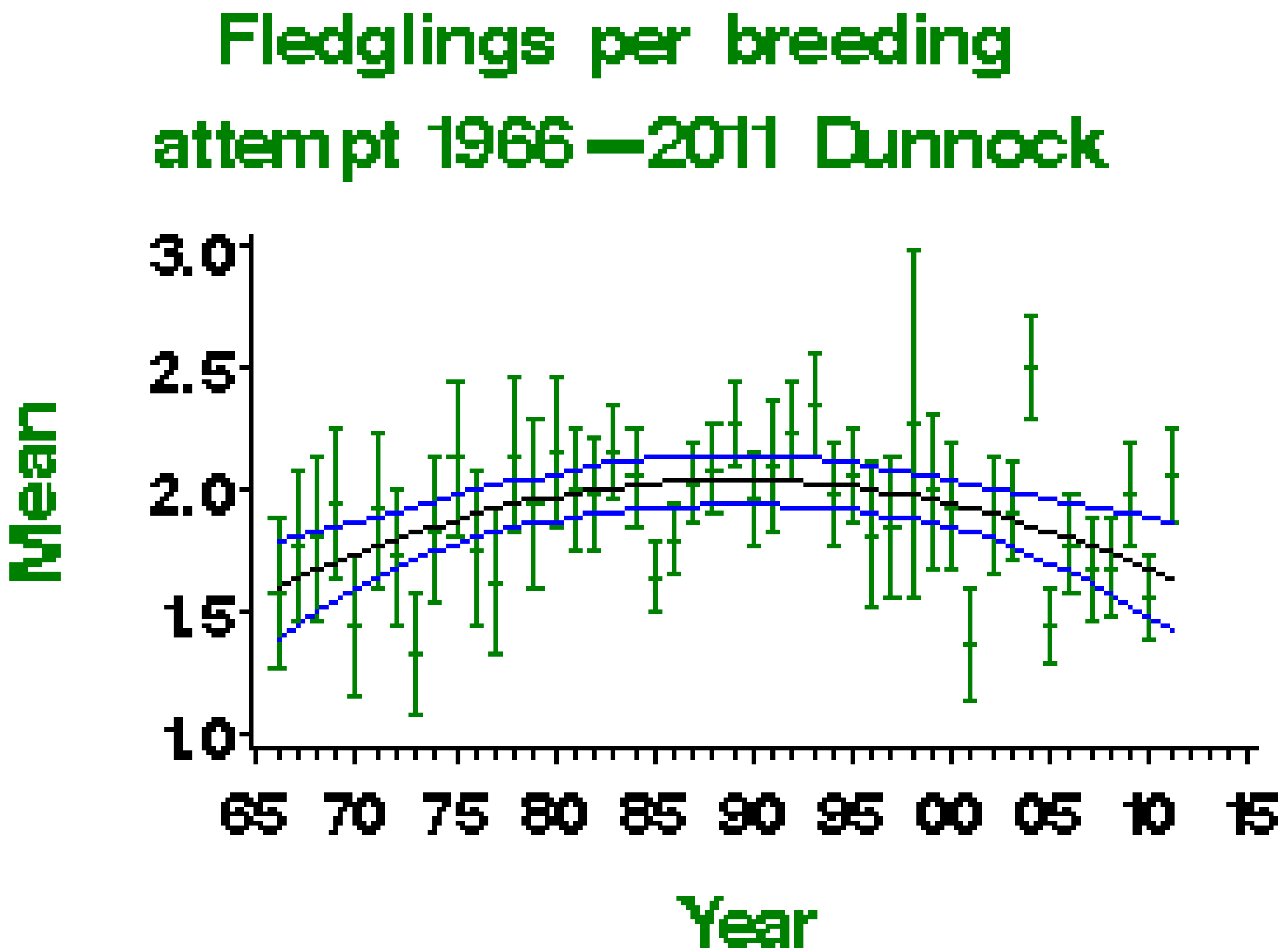


BBS Wales graph

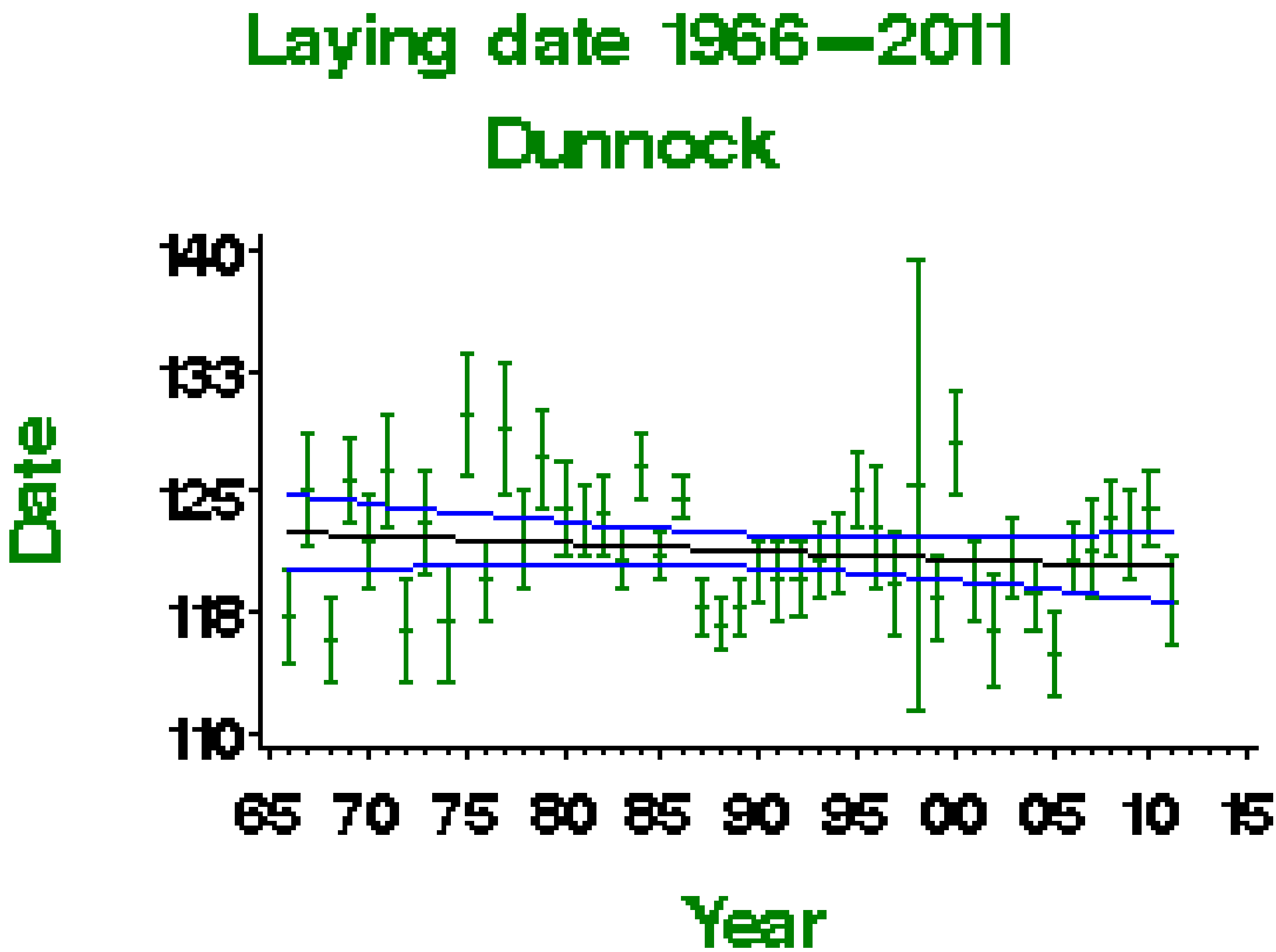


BBS N.Ireland graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

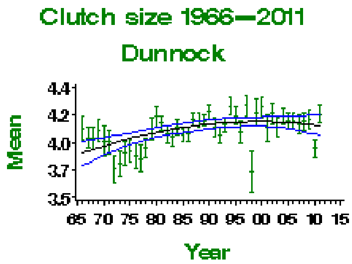


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

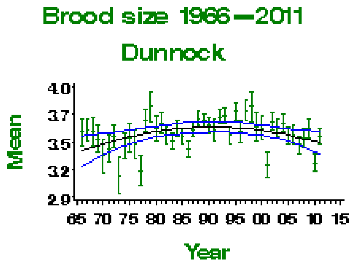
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	109	Curvilinear	1.68 fledglings	1.69 fledglings	0.7%		
Clutch size	42	1968-2010	101	Curvilinear	3.89 eggs	4.10 eggs	5.4%		
Brood size	42	1968-2010	111	Curvilinear	3.40 chicks	3.46 chicks	1.8%		
Nest failure rate at egg stage	42	1968-2010	141	Curvilinear	2.60% nests/day	2.38% nests/day	-8.5%		
Nest failure rate at chick stage	42	1968-2010	115	Curvilinear	2.44% nests/day	2.78% nests/day	13.9%		
Laying date	42	1968-2010	79	None			0 days		
Juvenile to Adult ratio (CES)	26	1984-2010	101	Smoothed trend	88 Index value	100 Index value	14%		
Juvenile to Adult ratio (CES)	25	1985-2010	104	Smoothed trend	94 Index value	100 Index value	6%		
Juvenile to Adult ratio (CES)	10	2000-2010	110	Smoothed trend	94 Index value	100 Index value	6%		
Juvenile to Adult ratio (CES)	5	2005-2010	106	Smoothed trend	83 Index value	100 Index value	20%		

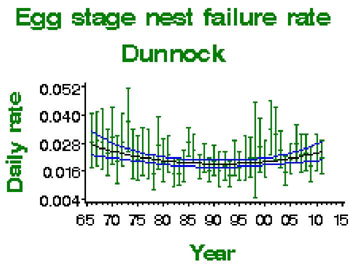
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



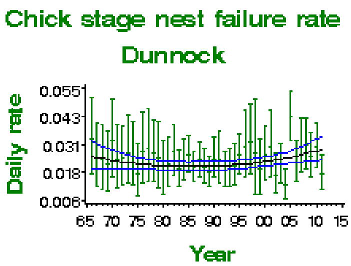
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



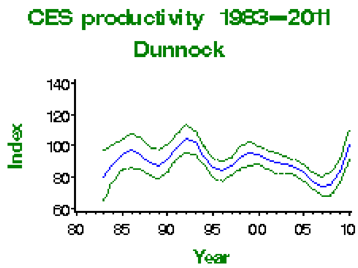
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



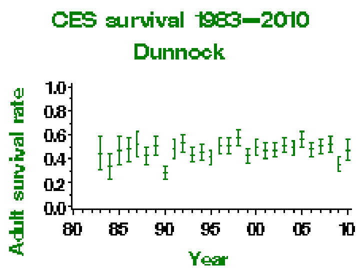
Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Smoothed long-term trend in ratio of juvenile:adult birds caught - green lines indicate 85% confidence limits



Proportion of adult birds surviving to following year - green bars represent 95% confidence limits

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House Sparrow

Passer domesticus

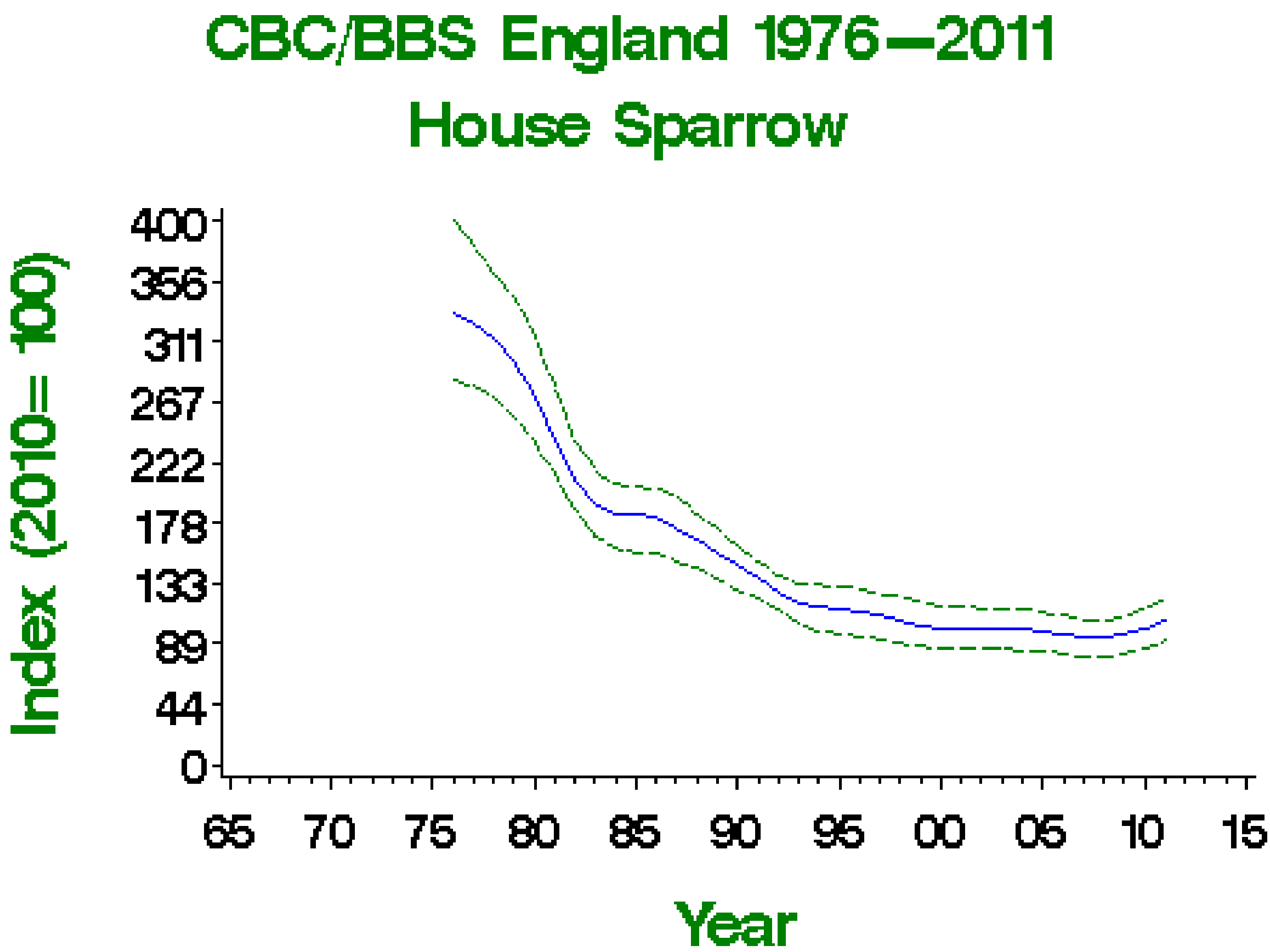
Key facts

Conservation listings:	Europe: SPEC category 3 (declining) (BiE04) UK: red (>50% population decline) (BoCC3) UK Biodiversity Action Plan: priority species
Long-term trend:	England: rapid decline
Population size:	5.3 (4.8-5.8) million pairs in 2009 (APEP13: distance sampling estimate for 2006 (Newson et al. 2008) updated using BBS trend)

Migrant status:	Resident
Nesting habitat:	Cavity nester
Primary breeding habitat:	Human habitats
Secondary breeding habitat:	
Breeding diet:	Vegetation
Winter diet:	Vegetation

Status summary

CBC sample sizes did not allow monitoring of House Sparrows until 1976; previously, there had been many farmland plots with high populations that could not be properly quantified without better access to farm buildings and housing. CBC/BBS data indicate a rapid decline in abundance over the last 25 years, as does the BTO's Garden Bird Feeding Survey (Siriwardena et al. 2002, Robinson et al. 2005b). These results are supported by many other studies and anecdotal reports, and have generated great conservation concern (see Summers-Smith 2003). The overall national decline since the 1970s masks much heterogeneity by region and habitat, and population processes may be relatively fine-grained: overall, populations in rural areas had declined by 47% by 2000, and those in urban and suburban areas by about 60% (CBC and GBFS data: Robinson et al. 2005b). The BBS PECBMS 2012a). The European status of this species is no longer considered 'secure' (BirdLife International 2004).



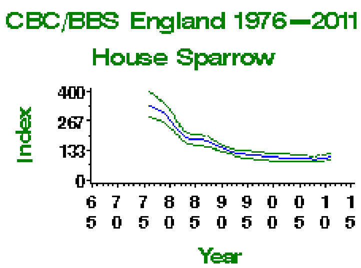
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

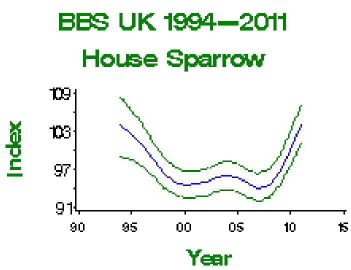
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	33	1977-2010	646	-69	-78	-58	>50	
	25	1985-2010	841	-46	-58	-27	>25	
	10	2000-2010	1404	-1	-6	5		
	5	2005-2010	1576	1	-2	5		
BBS UK	15	1995-2010	1558	-2	-9	4		
	10	2000-2010	1700	6	1	11		
	5	2005-2010	1900	5	1	9		
BBS England	15	1995-2010	1283	-14	-20	-8		
	10	2000-2010	1390	-2	-7	4		
	5	2005-2010	1557	2	-1	6		
BBS Scotland	15	1995-2010	90	40	10	76		
	10	2000-2010	97	25	3	47		
	5	2005-2010	112	4	-13	20		
BBS Wales	15	1995-2010	121	106	69	160		
	10	2000-2010	138	43	25	67		
	5	2005-2010	147	21	9	37		
BBS N.Ireland	15	1995-2010	52	57	-6	125		
	10	2000-2010	62	31	5	59		
	5	2005-2010	68	14	-5	33		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

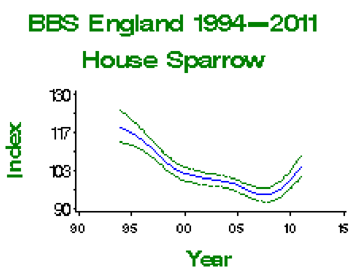
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



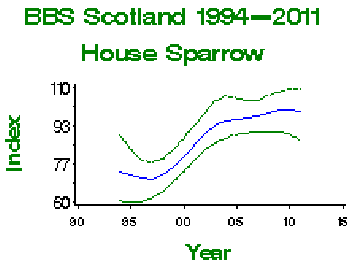
CBC/BBS England graph



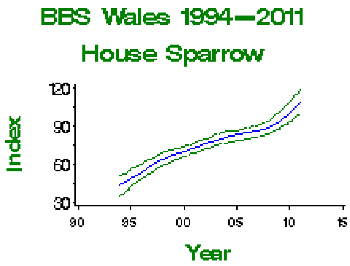
BBS UK graph



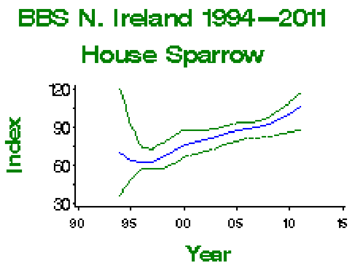
BBS England graph



BBS Scotland graph

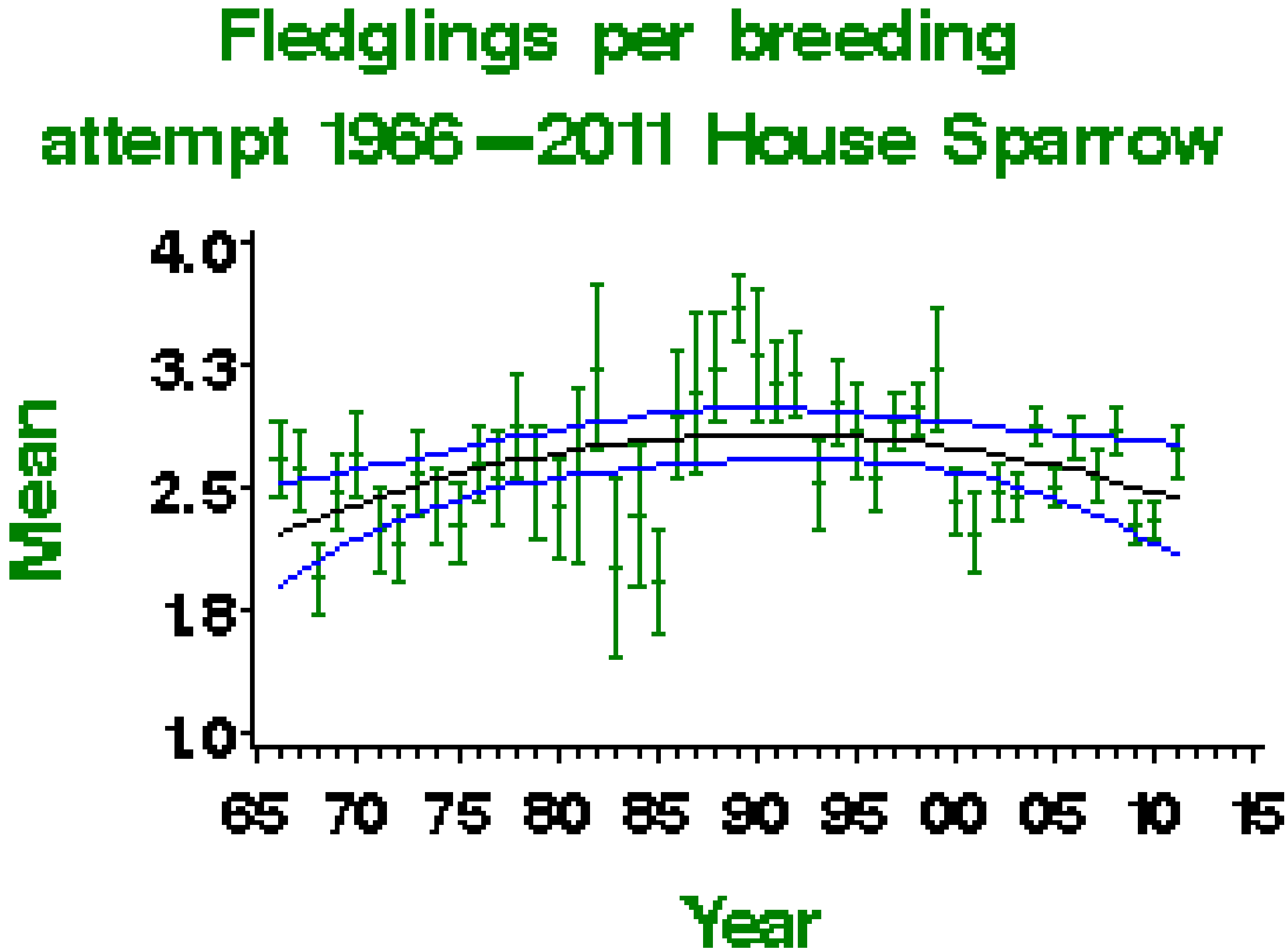


BBS Wales graph

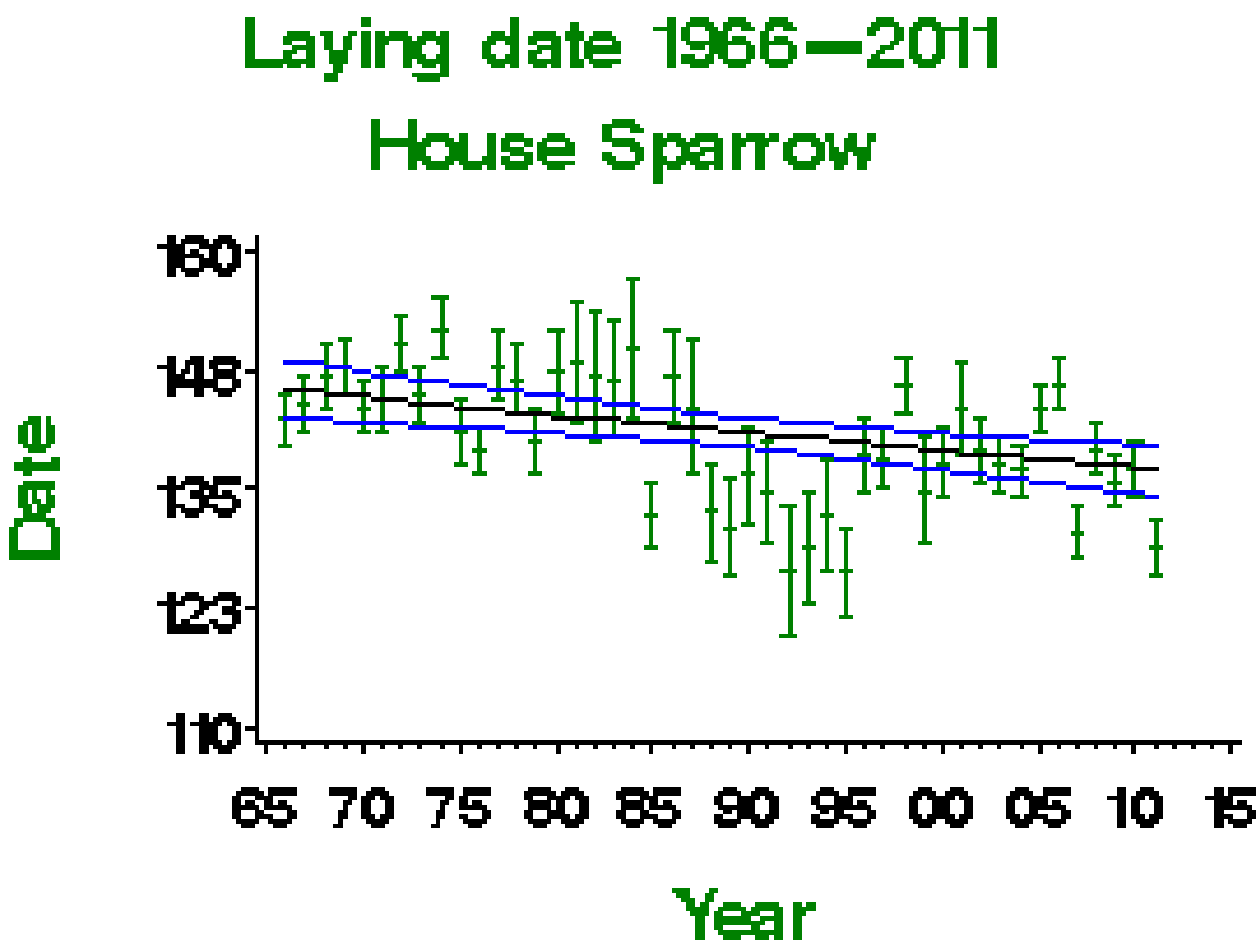


BBS N.Ireland graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

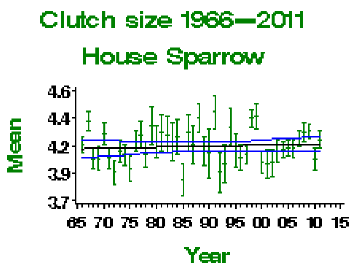


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

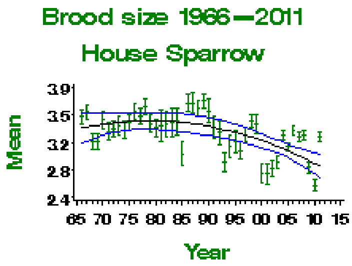
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	98	Curvilinear	2.32 fledglings	2.48 fledglings	6.9%		
Clutch size	42	1968-2010	80	None					
Brood size	42	1968-2010	143	Curvilinear	3.37 chicks	2.87 chicks	-14.9%		
Nest failure rate at egg stage	42	1968-2010	111	Linear decline	1.10% nests/day	0.39% nests/day	-64.5%		
Nest failure rate at chick stage	42	1968-2010	104	Curvilinear	1.41% nests/day	0.64% nests/day	-54.6%		
Laying date	42	1968-2010	63	Linear decline	May 25	May 17	-8 days		

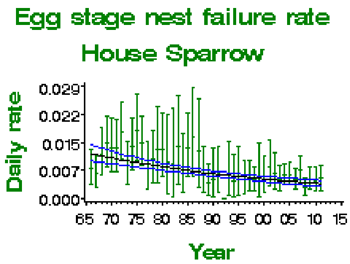
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



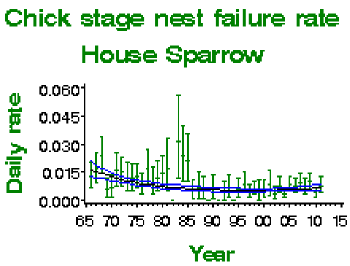
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



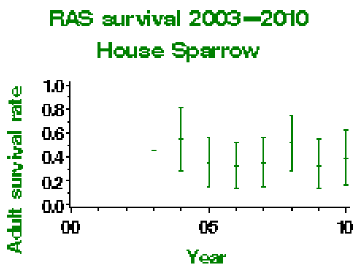
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of adult birds surviving to following year - error bars represent 95% confidence limits

Causes of change

There is evidence that changes in survival rates due to lack of resources, because of agricultural intensification, are the main driver of House Sparrow declines in farmland, although changes in breeding performance may also have played a role. Different processes have affected House Sparrows in towns, where breeding performance could be the most important driver of declines, although the evidence for the ecological causes is less clear.

Change factor	Primary driver	Secondary driver
Demographic	Decreased survival	Decreased breeding performance
Ecological	Agricultural intensification	

Further information on causes of change

A temporary drop in first-year survival coincided with the period of steepest decline, but changes in breeding performance, especially reduced nest failure rates at the chick stage, appear to have driven a levelling-off in the long-term population trend (Freeman & Crick 2002). Over the period 1968-2009, brood size has decreased (see above) but there has also been a decrease in nest failure rates at the egg and chick stage, so the number of fledglings per breeding attempt has shown a net increase. Further evidence for the role of changing survival in House Sparrow declines has been provided by Hole et al. (2002), who found no evidence of significant differences in most breeding-ecology parameters in declining and stable populations in a farm-scale comparison, while Siriwardena et al. (1999) found that national survival rates were lower during the period of decline in the CBC index. Crick & Siriwardena (2002) used NRS analysis to show that breeding performance per nesting attempt has increased and was positively correlated with population growth rate in the wider countryside (although there was no such correlation in gardens).

There appear to be different processes affecting urban and agricultural populations. On farmland, changes in farming practices due to intensification of agriculture and the tidying of farmyards have reduced the winter seed available to farmland populations of House Sparrows, which has resulted in a reduction in survival rates (Siriwardena et al. 1999, Chamberlain et al. 2007, Hole 2001), specifically of first-year birds (Cricket al. 2002). This is supported by a positive effect of supplementary seed in winter on farmland House Sparrow population trends in a landscape-scale experiment in East Anglia (Siriwardena et al. 2007). House Sparrows have probably been deleteriously affected by the decrease in the amount of grain spilt around farm buildings and during the process of harvesting in recent years (O'Connor & Shrubb 1986). The decrease in spring-sown cereals has meant that cereal stubble has become much rarer, reducing food resources over winter, although Robinson et al. (2001) found no influence of spring cereal on House Sparrow abundance in predominantly pastoral farmland. Conversely, breeding performance is worse where there is more spring cereal (Crick & Siriwardena 2002), although this may reflect geographical associations with areas where spring sowing remains in the UK (the west and north) rather than direct effects of cropping.

Recent declines have been particularly severe in urban areas (Robinson et al. 2005b, Chamberlain et al. 2007). Increased predation by cats and Sparrowhawks, lack of nest sites, loss of food supplies, pollution and disease have all been cited as factors possibly depressing populations in towns (Crick et al. 2002), but supporting evidence for these is mixed. Within urban areas, Shaw et al. (2008) reviewed available evidence and hypothesised that House Sparrows have disappeared from more affluent areas, where changes to habitat structure such as planting of ornamental shrubs and increased demand for off-street parking is likely to reduce the amount of habitat available to House Sparrows and influenced foraging and predation risk. The conversion of private gardens to continuous housing has also had a negative effect on House Sparrow abundance (Chamberlain et al. 2007). Vincent (2005) found that annual productivity among suburban and rural human habitation in Leicestershire was lower than that measured on farmland House Sparrows in Oxfordshire, the main cause of the difference being starvation of chicks. Low body masses at fledging, and consequently low post-fledging survival, were also recorded in Leicestershire. Although only a two-year study, Peach et al. (2008) measured reproductive success in a declining House Sparrow population along an urbanisation gradient in Leicester and also found that a year in which reproductive success was too low to sustain the population was characterised by lower chick survival and body mass at fledging (a predictor of post-fledging survival). However, there is no direct evidence that invertebrate food supplies have declined in these areas and variation in survival has not been investigated.

Negative correlations between indices of Sparrowhawk presence during its recolonisation of the UK and House Sparrow abundance from the Garden Bird Feeding Survey have been interpreted as evidence that increasing predation rates are depressing House Sparrow populations (Bell et al. 2010). However, more sophisticated analyses of large-scale and extensive national monitoring data provide no evidence that House Sparrow population declines were linked to increases in Sparrowhawks (Newson et al. 2010b).

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Tree Sparrow

Passer montanus

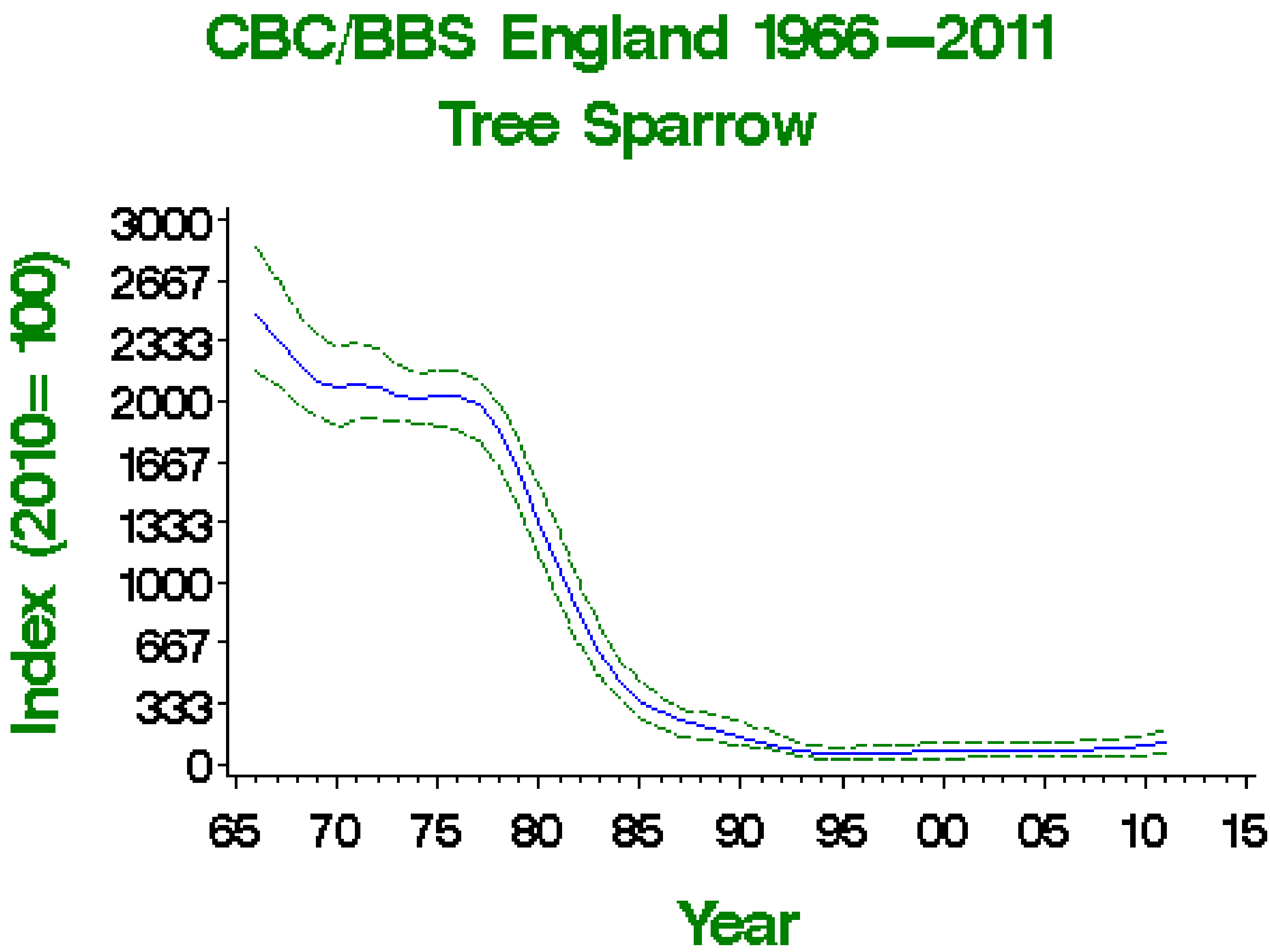
Key facts

Conservation listings:	Europe: SPEC category 3 (declining) (BiE04) UK: red (>50% population decline) (BoCC3) UK Biodiversity Action Plan: click here, priority species
Long-term trend:	England: rapid decline
Population size:	200,000 territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Migrant status:	Resident
Nesting habitat:	Cavity nester
Primary breeding habitat:	Farmland
Secondary breeding habitat:	
Breeding diet:	Vegetation
Winter diet:	Vegetation

Status summary

Tree Sparrow abundance crashed spectacularly in the UK between the late 1970s and the early 1990s. BBS data indicate a significant increase since 1994, but it should be remembered that, for every Tree Sparrow today there were perhaps around 30 in the 1970s, and any recovery therefore has a very long way to go. Clear range contractions occurred between the two breeding atlas periods (Gibbons et al. 1993), and have continued subsequently, with many local extinctions occurring during the 1990s. Following declines across western and northwestern Europe during the 1990s, the European status of this species is no longer considered 'secure' (BirdLife International 2004). There has been widespread moderate decrease across Europe since 1980 (PECBMS 2012a).



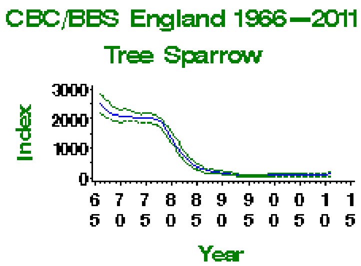
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

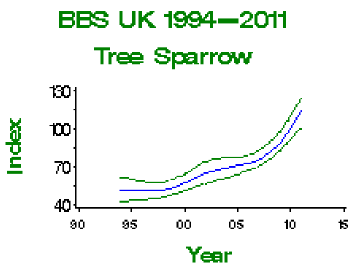
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	43	1967-2010	91	-96	-98	-91	>50	
	25	1985-2010	97	-72	-87	-52	>50	
	10	2000-2010	142	50	23	81		
	5	2005-2010	159	30	14	55		
BBS UK	15	1995-2010	166	96	56	158		
	10	2000-2010	179	75	42	116		
	5	2005-2010	204	42	18	69		
BBS England	15	1995-2010	133	58	23	96		
	10	2000-2010	141	45	21	77		
	5	2005-2010	158	30	14	52		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

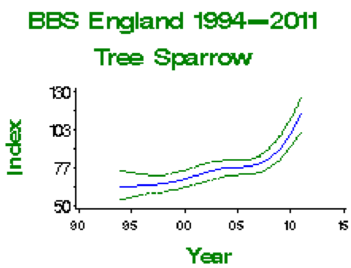
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



CBC/BBS England graph

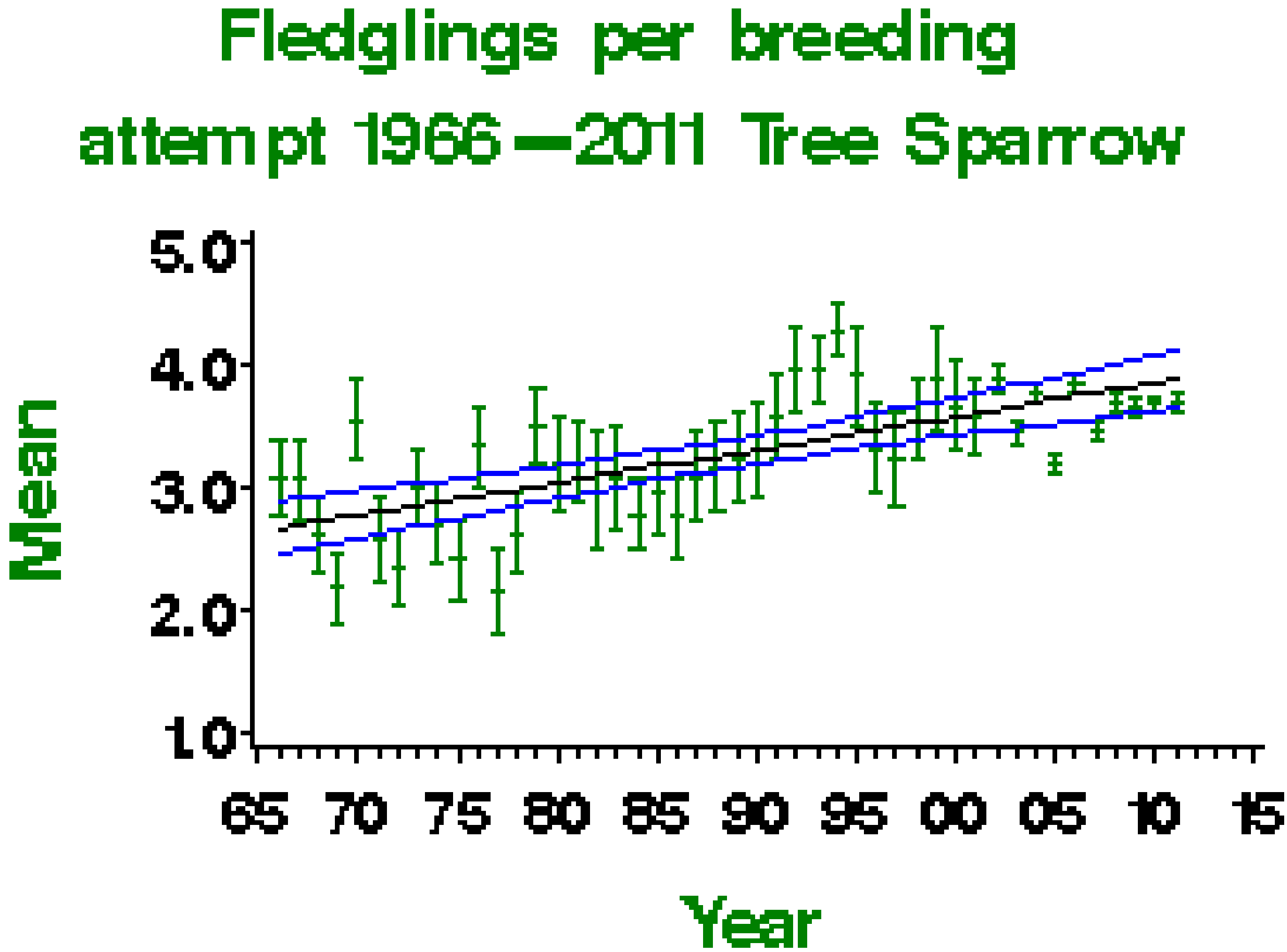


BBS UK graph

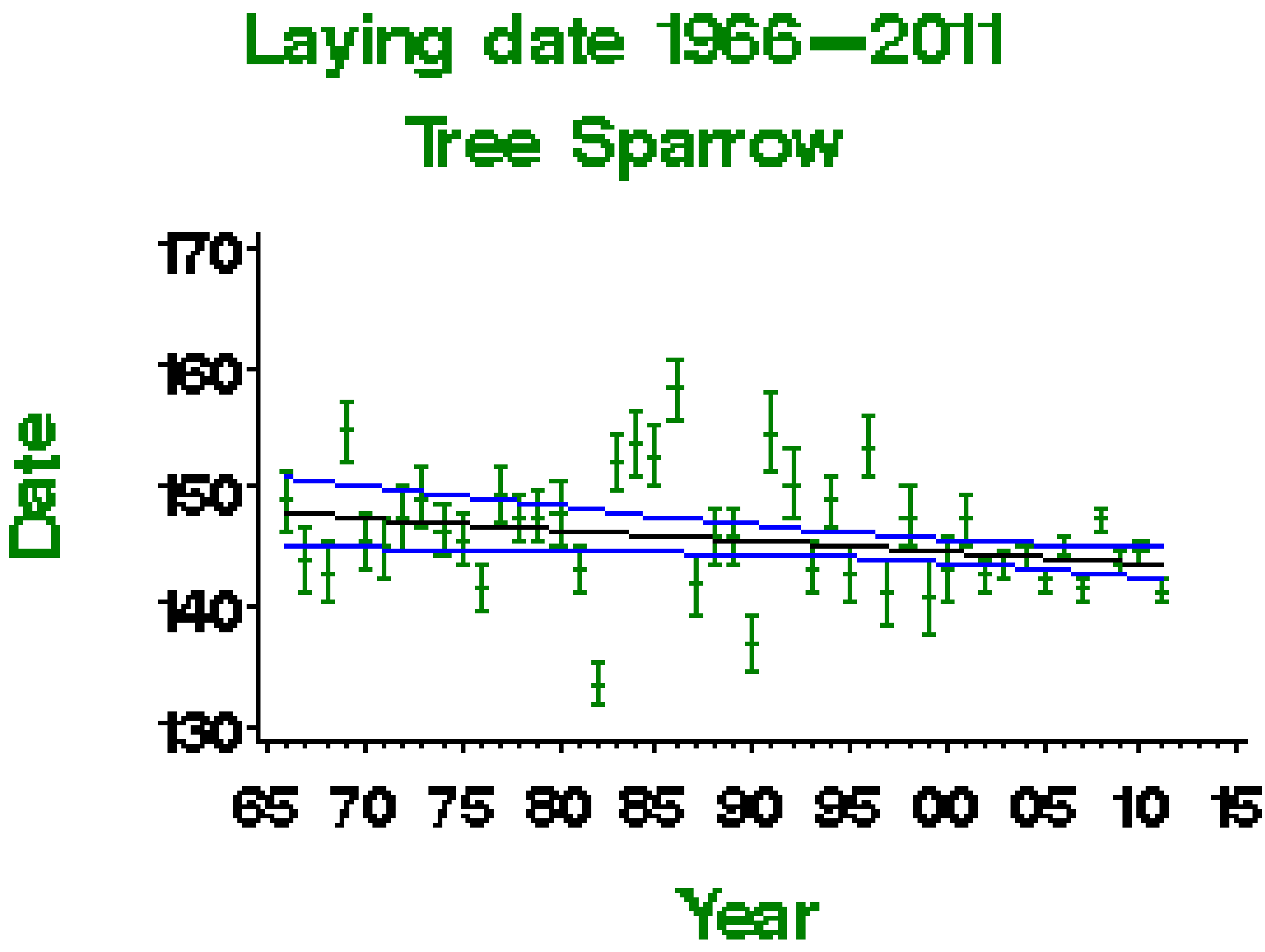


BBS England graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend



Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

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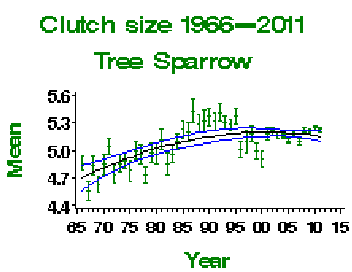
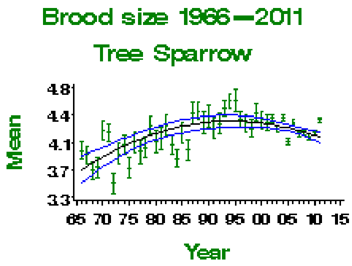
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	238	Linear increase	2.73 fledglings	3.86 fledglings	41.2%		
Clutch size	42	1968-2010	263	Curvilinear	4.76 eggs	5.16 eggs	8.4%		
Brood size	42	1968-2010	351	Curvilinear	3.77 chicks	4.15 chicks	9.9%		
Nest failure rate at egg stage	42	1968-2010	347	Linear decline	0.86% nests/day	0.33% nests/day	-61.6%		
Nest failure rate at chick stage	42	1968-2010	238	Linear decline	1.51% nests/day	0.54% nests/day	-64.2%		
Laying date	42	1968-2010	266	Linear decline	May 28	May 24	-4 days		

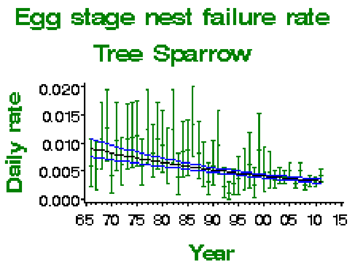
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



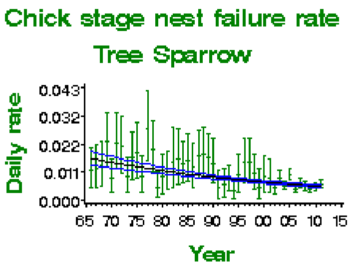
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

Causes of change

The mechanisms underlying the decline in this species are largely unknown, although demographic trends suggest that factors operating during the breeding season are not the main driver.

Change factor	Primary driver	Secondary driver
Demographic	Decreased survival?	
Ecological	Agricultural intensification	

Further information on causes of change

The mechanisms underlying the decline in this species are largely unknown. The number of fledglings per breeding attempt has improved substantially as population sizes have decreased (see above), suggesting that decreases in productivity were not responsible for the decline. This has been driven by a decline in daily failure rates at both the nest and chick stage and increases in clutch and brood size. It is thus more likely that survival has been the critical demographic measure, although ring-recovery analyses have produced equivocal results, perhaps because of small sample sizes (Siriwardena et al. 1998, 2000b).

Components of agricultural intensification, such as reductions in winter stubble, have been implicated in the decline, although direct evidence supporting this is largely incidental. Tree Sparrows aggregate in areas where seed food is available during the winter and they have declined at the same time as other farmland seed-eaters (Siriwardena et al. 1998), providing circumstantial evidence for the decline. In winter in Scotland (Hancock & Wilson 2003), the highest densities of Tree Sparrows were recorded in cereal stubble fields (undersown with grass) and weedy fodder brassica crops. These habitats remain relatively seed-rich but have declined in area in the UK (Fuller 2000, Hancock & Wilson 2003). Field & Anderson (2004) also state that anecdotal evidence suggests that many Tree Sparrow colonies are strongly associated with winter seed food sources, and provision of new seed sources is frequently associated with the establishment of new breeding colonies. Although Siriwardena et al. (2007) did not find a significant positive relationship between winter food supply and breeding population trajectory in Bird Aid-fed areas, this may be due to the fact that latest BBS trends for this species are increasing, so winter food may not currently be limiting as the remaining population is in small remnants of suitable habitat and many are subject to active conservation action (e.g. nestboxes).

During the breeding season, Field & Anderson (2004) found that wetland edge habitats played a key role in providing invertebrate prey to allow successful chick rearing throughout the long breeding season and suggest that it is possible that large areas of formerly occupied farmland in the UK no longer provide these invertebrate resources due to the effects of intensification in the late 20th century.

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Yellow Wagtail

Motacilla flava

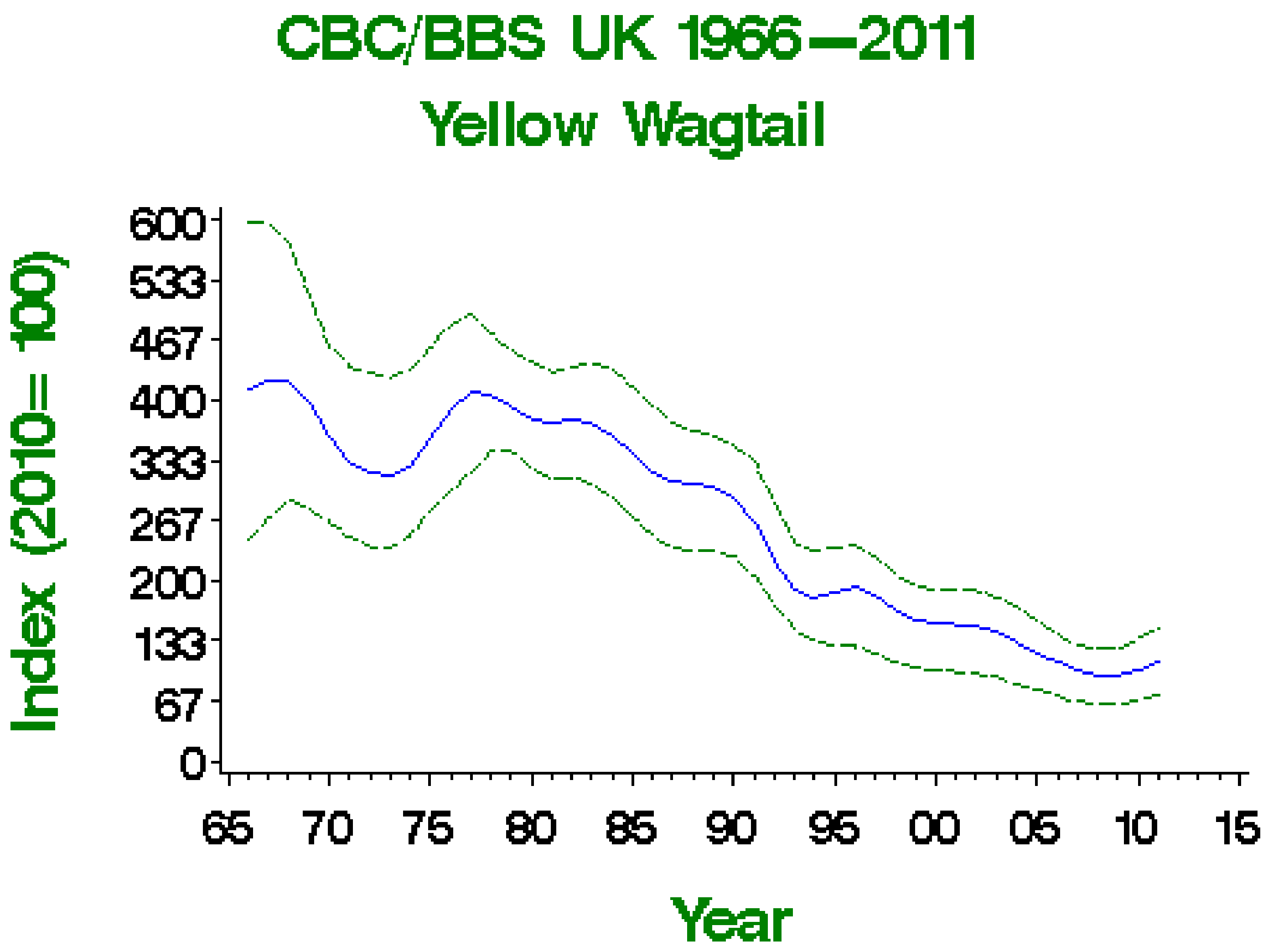
Key facts

Conservation listings:	Europe: no SPEC category (favourable conservation status in Europe, not concentrated in Europe) (BiE04) UK: red (species level, races *flavissima* and *flava*) (BoCC3) UK Biodiversity Action Plan: priority species
Long-term trend:	UK, England: rapid decline
Population size:	15,000 territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Migrant status:	Long-distance migrant
Nesting habitat:	Ground nester
Primary breeding habitat:	Farmland
Secondary breeding habitat:	
Breeding diet:	Animal
Winter diet:	Animal

Status summary

Britain holds almost the entire population of the distinctive race flavissima, so population changes in the UK are of global conservation significance. Yellow Wagtails have been in decline since the early 1980s, according to CBC/BBS and especially WBS/WBBS and, after a shift from the green to the amber list in 2002, the species has now been moved to the red list (Eaton et al. 2009). Gibbons et al. (1993) identified a range contraction towards a core area in central England, concurrent with the early years of decline. Sufficient data are available to produce a demographic trend only for brood size, which was found to have decreased by 9% since 1966, and the species is listed as being of NRS concern (Leech & Barimore 2008). The European trend, which includes other races of the species, has also been moderately downward since 1980, though with little change since 1990 (PECBMS 2012a).



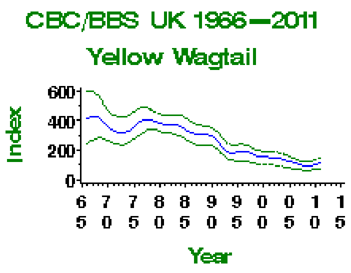
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

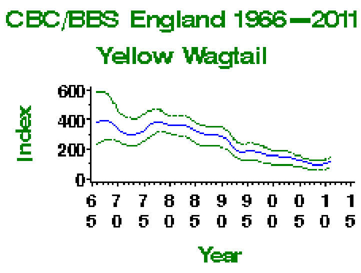
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	78	-76	-88	-53	>50	
	25	1985-2010	111	-71	-83	-59	>50	Small CBC sample
	10	2000-2010	153	-35	-44	-21	>25	
	5	2005-2010	156	-17	-29	-3		
CBC/BBS England	43	1967-2010	77	-75	-89	-47	>50	
	25	1985-2010	108	-69	-81	-54	>50	Small CBC sample
	10	2000-2010	149	-34	-43	-19	>25	
	5	2005-2010	153	-18	-29	-4		
WBS/WBBS waterways	35	1975-2010	24	-94	-98	-87	>50	
	25	1985-2010	23	-92	-97	-85	>50	
	10	2000-2010	25	-47	-72	-1	>25	
	5	2005-2010	22	-8	-43	54		
BBS UK	15	1995-2010	156	-50	-59	-40	>50	
	10	2000-2010	151	-35	-44	-23	>25	
	5	2005-2010	155	-17	-26	-5		
BBS England	15	1995-2010	152	-50	-59	-40	>50	
	10	2000-2010	147	-35	-45	-25	>25	
	5	2005-2010	152	-17	-29	-4		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

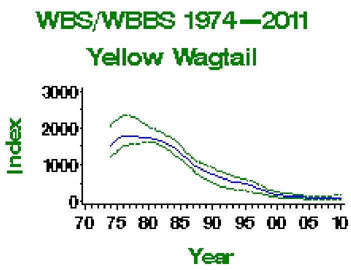
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



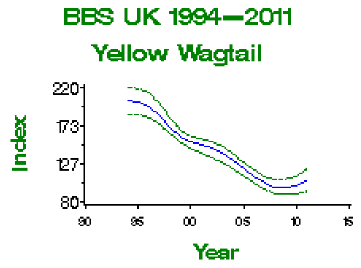
CBC/BBS UK graph



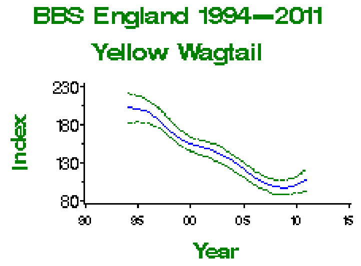
CBC/BBS England graph



WBS/WBBS waterways graph

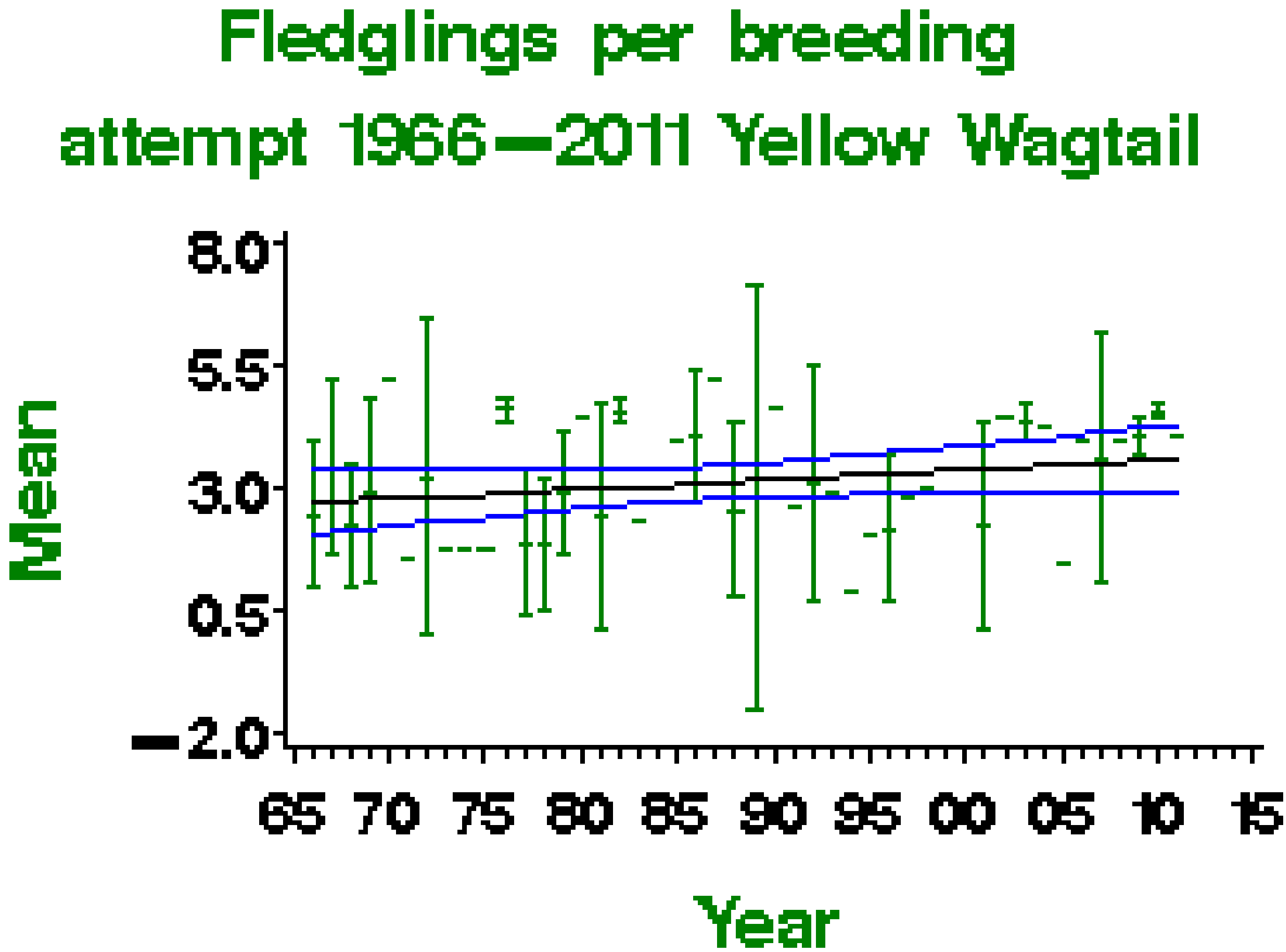


BBS UK graph

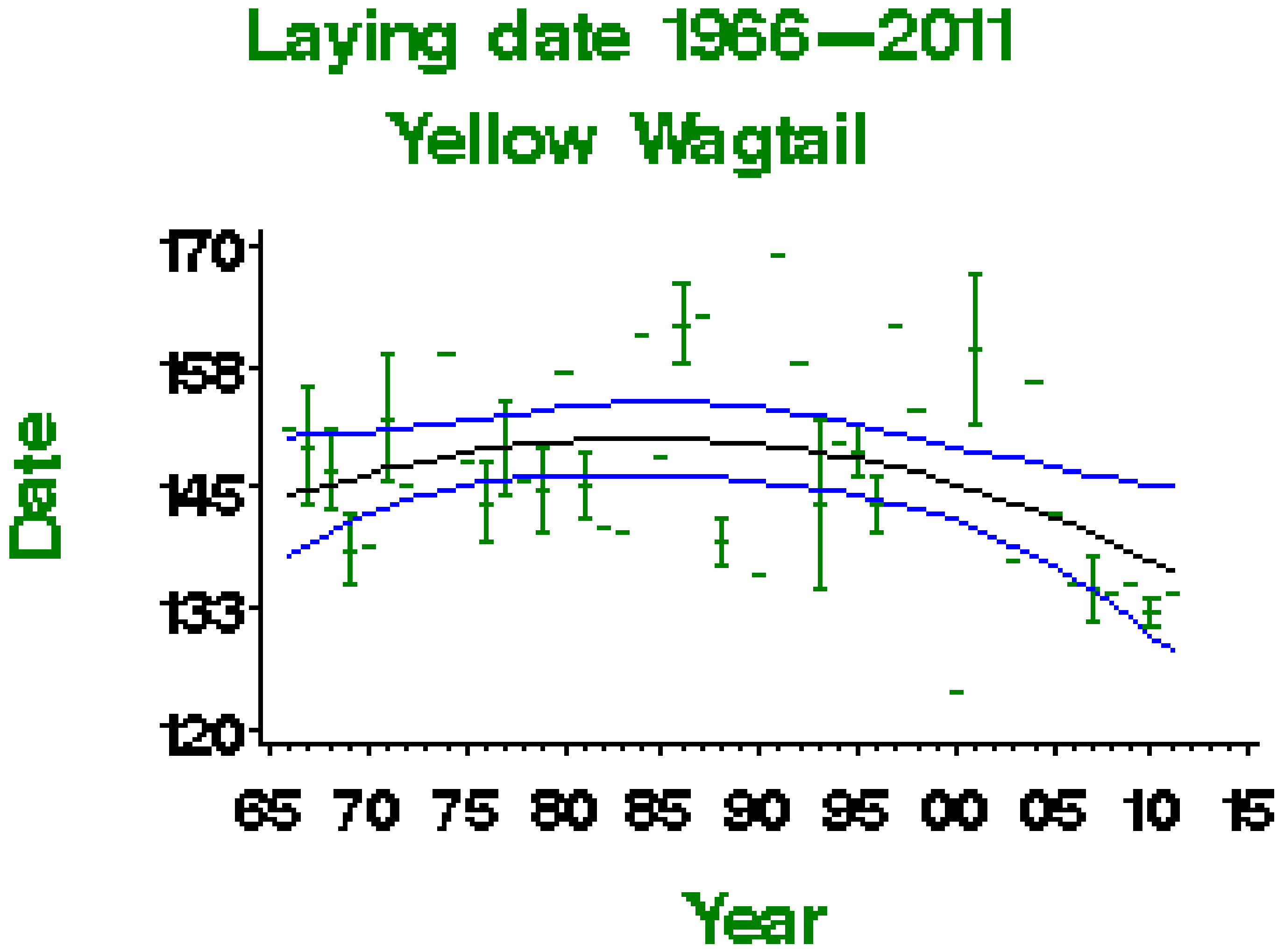


BBS England graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

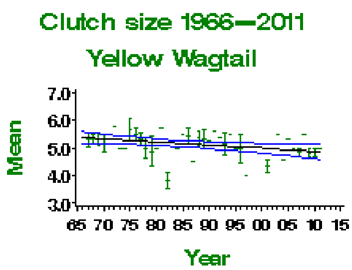


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

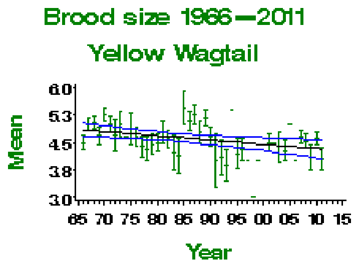
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Brood size	42	1968-2010	12	Linear decline	4.82 chicks	4.33 chicks	-10.1%		Small sample

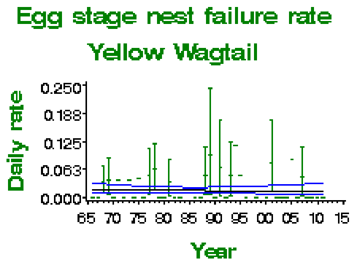
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



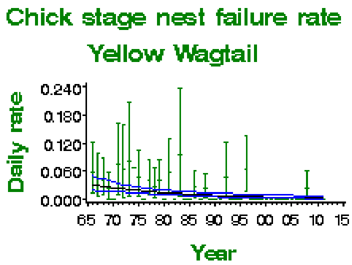
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

Causes of change

Agricultural intensification is the ultimate cause of population declines. However, the mechanisms underlying the decline remain unclear.

Change factor	Primary driver	Secondary driver
Demographic	Unknown	
Ecological	Agricultural intensification	

Further information on causes of change

Changes in agricultural practices have been proposed as the main reason for declines via their impact on the quality of foraging and breeding habitats. The magnitude of Yellow Wagtail decline appears to vary between habitats, being especially dramatic in wet grassland and marginal upland areas (Henderson et al. 2004, Wilson & Vickery 2005). Chamberlain & Fuller (2000, 2001) found that there were greater range contractions in regions dominated by pastoral agriculture. The decline in pastoral habitats has been proposed to be due to agricultural intensification, specifically farmland drainage, the conversion of pasture to arable land, changes in grazing and cutting regimes the loss of insects associated with cattle and changes to grassland ecosystems in marginal upland areas (Gibbons et al. 1993, Chamberlain & Fuller 2000, 2001, Flyckt 1999, Vickery et al. 2001, Nelson et al. 2003, Bradbury & Bradter 2004, Henderson et al. 2004). Such changes are likely to have reduced the quality of grasslands as a nesting and foraging habitat. A detailed study on Yellow Wagtail breeding ecology by Bradbury & Bradter (2004) provided good evidence of the species' breeding requirements on grassland. Territories were associated with a greater proportion of bare earth in the sward, the presence of shallow-edged ponds or wet ditches in the field, and a greater probability of a prolonged winter/spring flood, although the relative importance of these and how they impact upon demographic processes was not deciphered.

Data from eastern England suggest a strong avoidance of grassland and preference for spring-sown crops (Mason & Macdonald 2000), though breeding can also be successful in landscapes dominated by winter cereals (Kirby et al. 2012). A detailed autecological study by Gilroy et al. (2008) provides good evidence that, on arable land, soil penetrability had a significant influence on the abundance of Yellow Wagtails, together with crop type and soil type, as these influenced invertebrate capture rates. There was a strong relationship between Yellow Wagtails and soil penetrability, suggesting a potential causative link between soil degradation and population decline (Gilroy et al. 2008). Breeding-season length may also be limited in cereal-dominated areas, as Yellow Wagtails avoid autumn-sown cereals late in the season (Gilroy et al. 2009, 2010). Predation was also considered and it was found that predation rate was closer nearer to tramlines and field-edges (Morris & Gilroy 2008). It is uncertain how important nest predation in tramlines is as a limiting factor for Yellow Wagtail populations but no studies have reported predation as a major driver of population decline for this species. Work carried out by Benton et al. (2002) showed that, in Scotland, arthropod abundance was significantly related to agricultural change and that this was also linked to measures of farmland bird density. Although Yellow Wagtail was not a species they considered specifically, it is an obligate insectivore, so this evidence adds support to the hypothesis that reduced food availability due to agricultural change may have contributed to the declines in this species.

Yellow Wagtails are long-distance migrants, moving to wintering grounds in western Africa south of the Sahara. Factors relating to conditions on the wintering grounds may also play a role (Bradbury & Bradter 2004, Heldbjerg & Fox 2008, Stevens et al. 2010) but evidence for this is lacking.

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

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Grey Wagtail

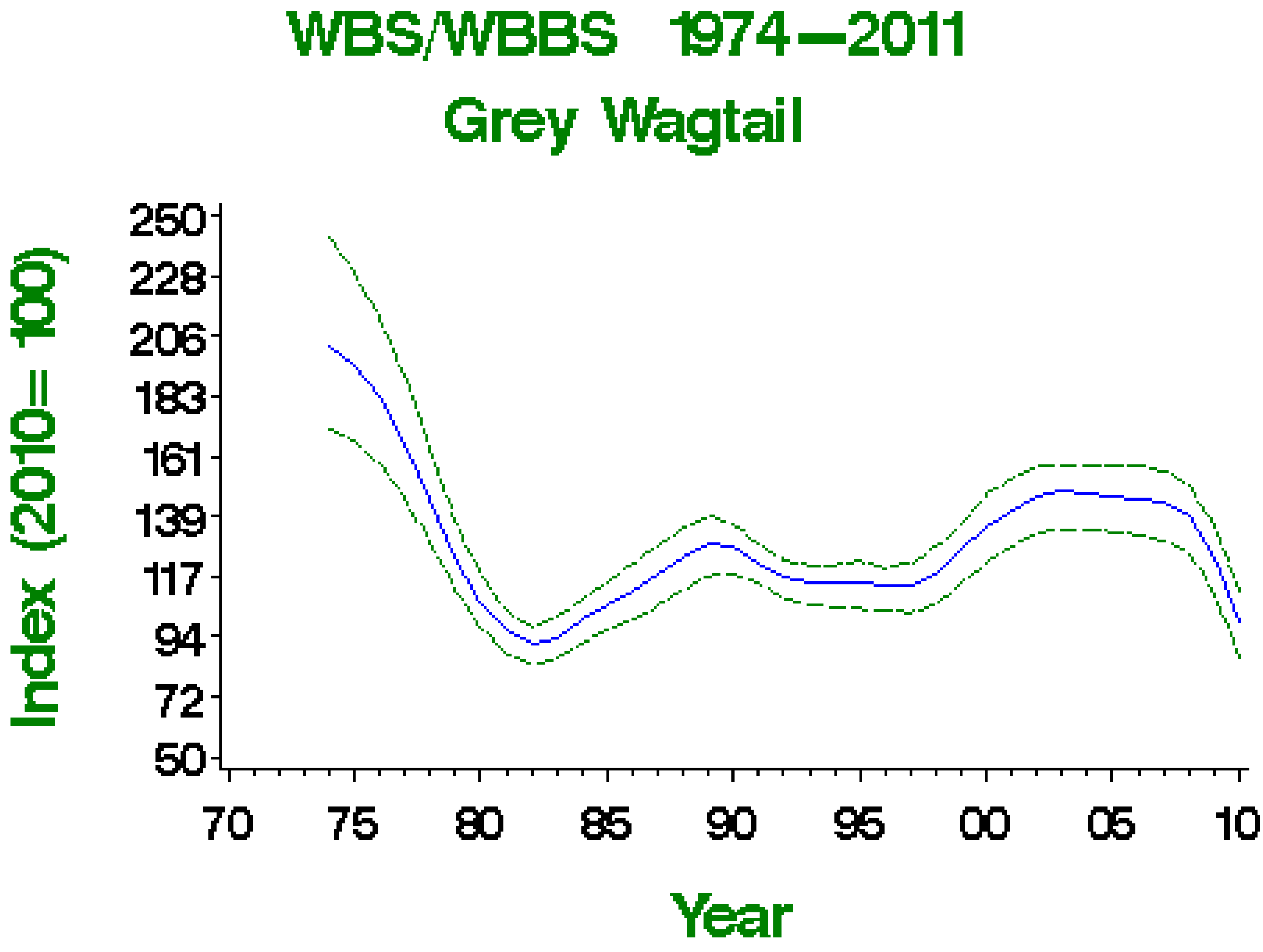
Motacilla cinerea

Key facts

Conservation listings:	Europe: no SPEC category (favourable conservation status in Europe, not concentrated in Europe) (BiE04) UK: amber (25-50% population decline) (BoCC3)
Long-term trend:	UK waterways: moderate decline
Population size:	38,000 pairs in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Status summary

Grey Wagtails occur at highest densities along fast-flowing upland streams. WBS/WBBS shows a fluctuating population size along waterways, with a fall during the late 1970s and early 1980s from an initial high point in 1974, some increase since the late 1990s, and another recent fall. The species was moved from the green to the amber list in 2002, because of a 41% decline recorded between 1975 and 1999. BBS figures showed an initial ten-year phase of increase, which has now been eroded by recent losses. The trends for Grey Wagtail are very similar to those for Leech & Barimore 2008). Nest failure rates have dropped substantially, and there has been linear increase in the number of fledglings per breeding attempt. Numbers have shown widespread moderate decrease across Europe since 1980 (PECBMS 2012a).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

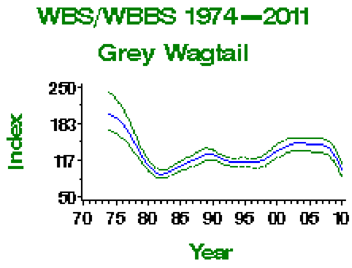
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
WBS/WBBS waterways	35	1975-2010	96	-49	-61	-35	>25	
	25	1985-2010	114	-6	-23	11		
	10	2000-2010	174	-26	-37	-14	>25	
	5	2005-2010	172	-32	-39	-25	>25	

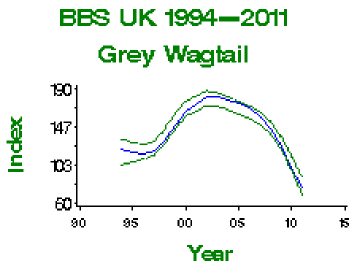
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	15	1995-2010	226	-15	-23	6		
	10	2000-2010	266	-39	-45	-29	>25	
	5	2005-2010	302	-42	-45	-32	>25	
BBS England	15	1995-2010	150	3	-12	24		
	10	2000-2010	178	-21	-30	-9		
	5	2005-2010	206	-29	-35	-19	>25	
BBS Scotland	15	1995-2010	30	-16	-43	33		
	10	2000-2010	32	-50	-66	-31	>50	
	5	2005-2010	34	-48	-64	-25	>25	

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

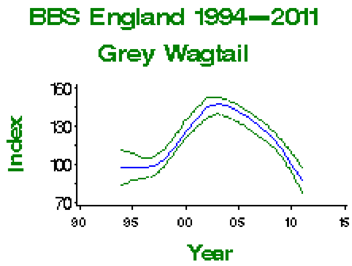
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



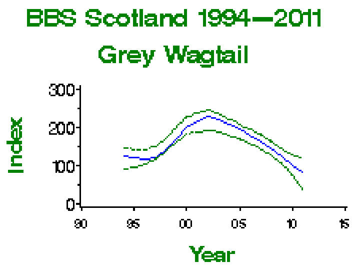
WBS/WBBS waterways graph



BBS UK graph

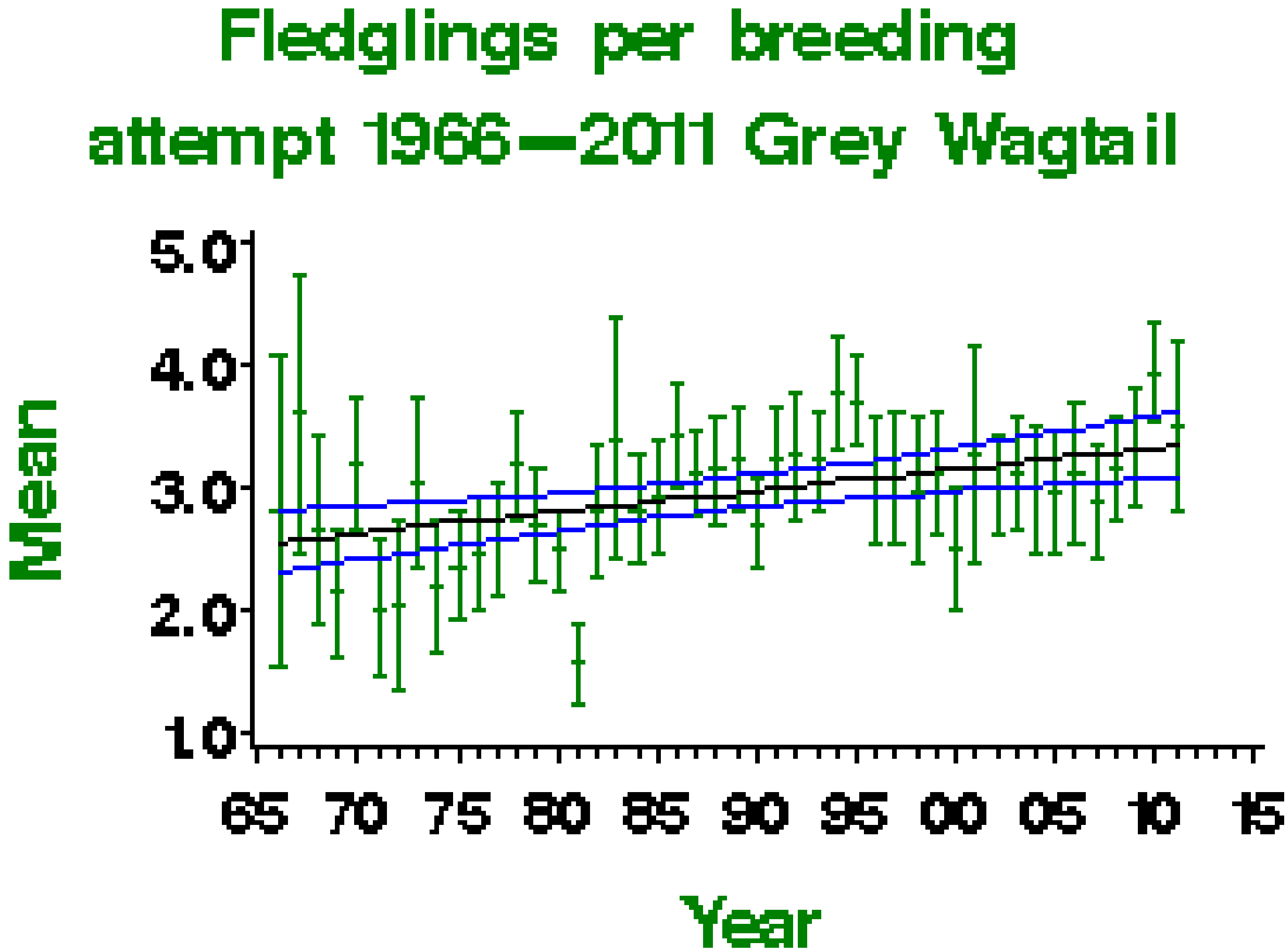


BBS England graph

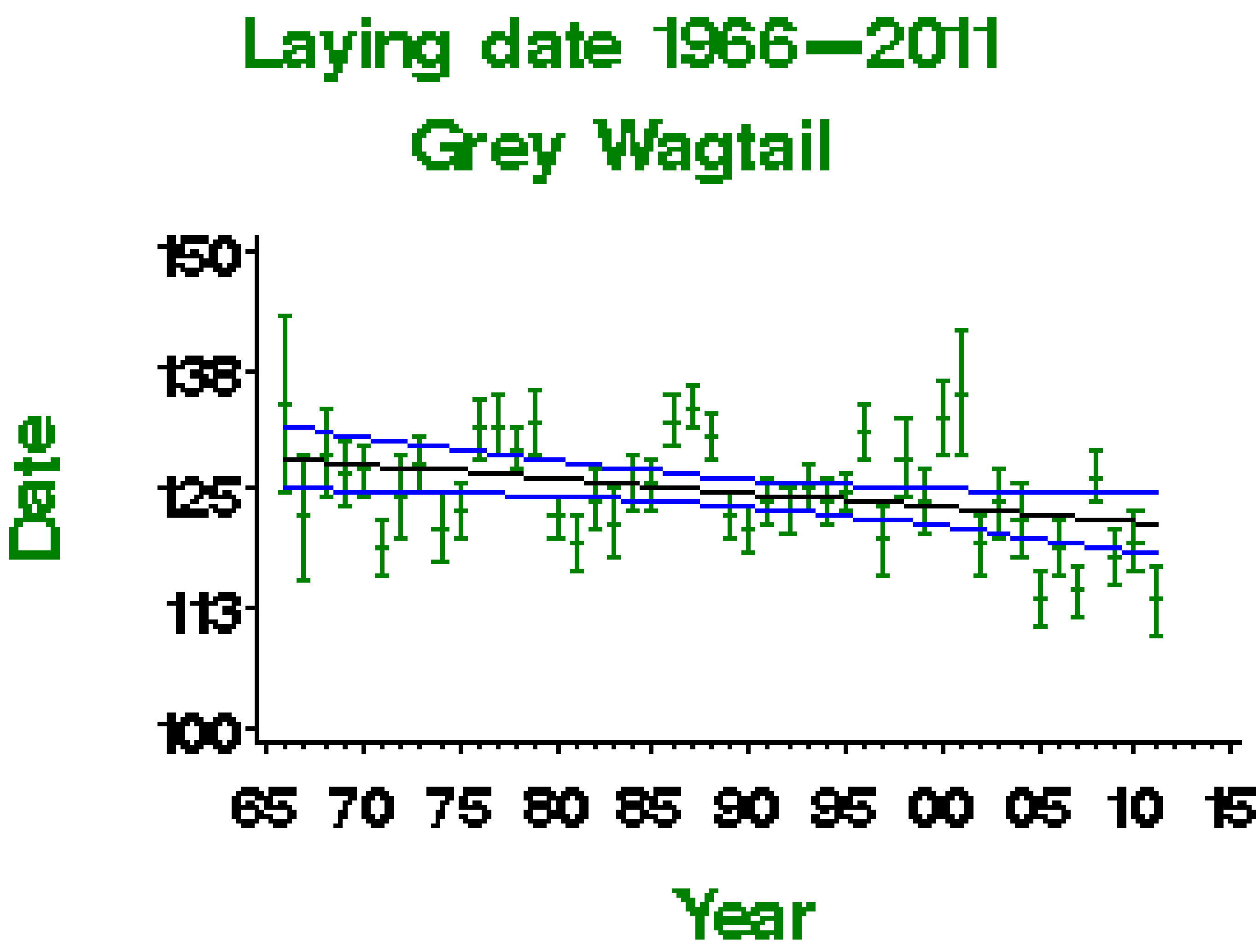


BBS Scotland graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

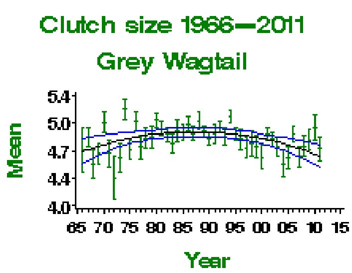


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

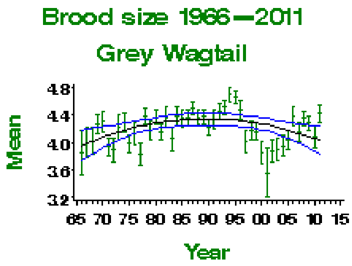
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	54	Linear increase	2.61 fledglings	3.34 fledglings	28.0%		
Clutch size	42	1968-2010	38	Curvilinear	4.74 eggs	4.66 eggs	-1.7%		
Brood size	42	1968-2010	80	Curvilinear	4.01 chicks	4.05 chicks	1.0%		
Nest failure rate at egg stage	42	1968-2010	57	Linear decline	1.81% nests/day	0.95% nests/day	-47.5%		
Nest failure rate at chick stage	42	1968-2010	57	Linear decline	2.17% nests/day	0.78% nests/day	-64.1%		
Laying date	42	1968-2010	60	Linear decline	May 8	May 2	-6 days		

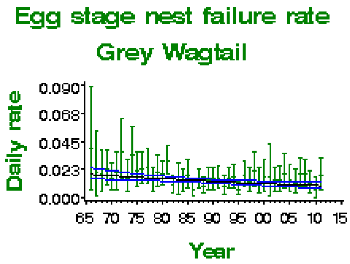
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



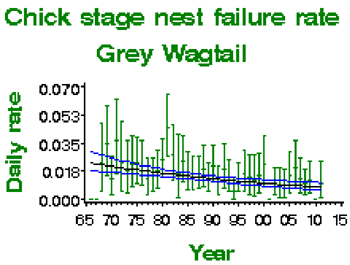
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

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Pied/White Wagtail

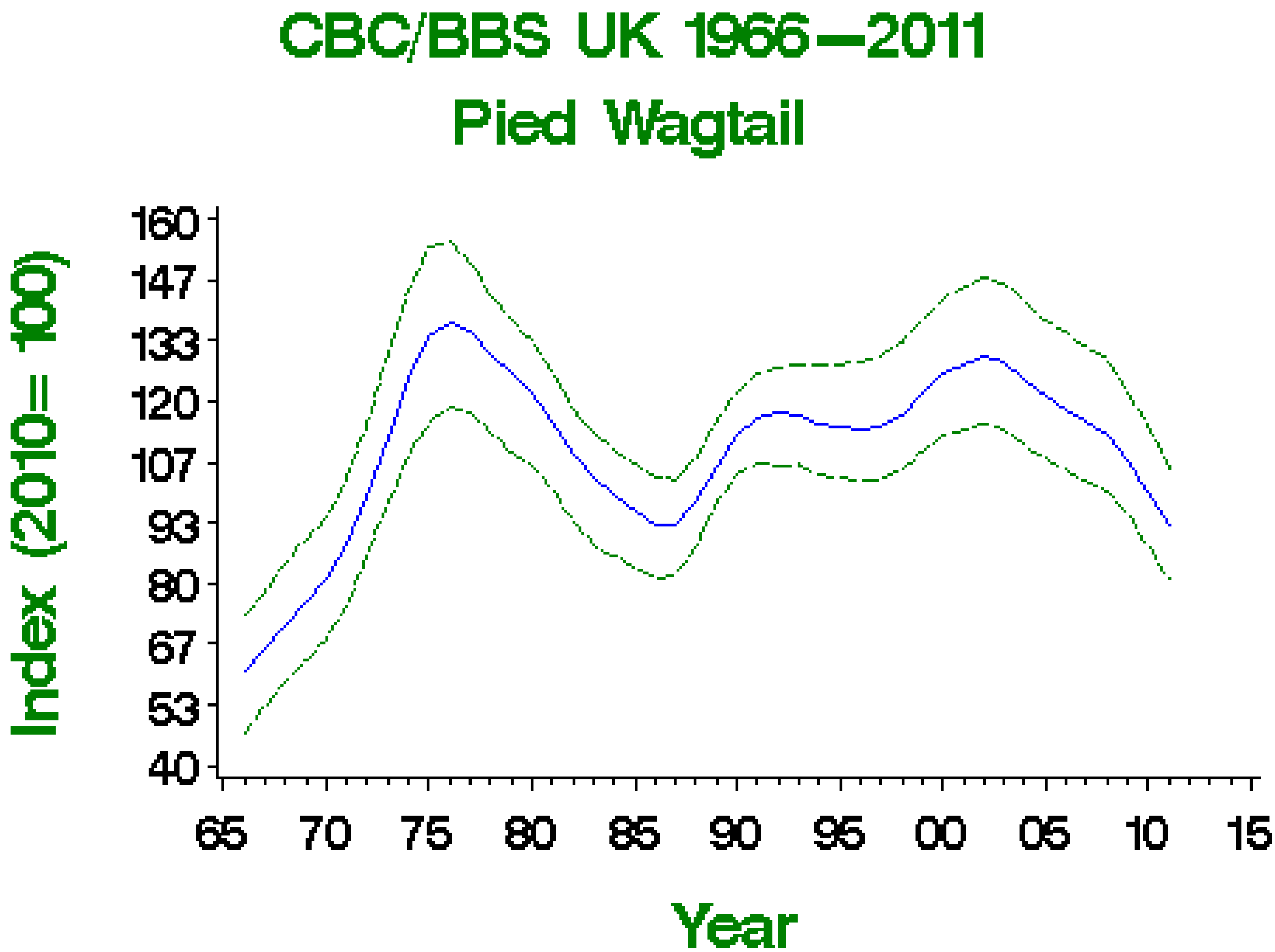
Motacilla alba

Key facts

Conservation listings:	Europe: no SPEC category (favourable conservation status in Europe, not concentrated in Europe) (BiE04) UK: green (species level); amber (race *yarrellii*, >20% of European breeders) (BoCC3)
Long-term trend:	UK: uncertain
Population size:	470,000 (410,000-520,000) pairs in 2009 (APEP13: distance sampling estimate for 2006 (Newson et al. 2008) updated using BBS trend)

Status summary

Britain and Ireland together hold almost the entire population of the distinctive dark-backed race yarrellii, and for this reason population changes in the UK are of global conservation significance. The CBC shows that a strong increase occurred up to the mid 1970s, such that populations have shown moderate increase overall since 1966. Since 1974, however, the results of monitoring are somewhat conflicting: CBC/BBS and WBS/WBBS trends fluctuate in parallel but, whereas little overall change is evident in the CBC/BBS index, WBS/WBBS has shown a rapid decline, perhaps suggesting the influence of factors specific to linear waterways. The BBS Siriwardena et al. 1998a). Average clutch and brood sizes have declined a little, raising NRS concern (Leech & Barimore 2008), but this has been counteracted by a large fall in nest failure rates. The number of fledglings per breeding attempt has shown a strong linear increase. The European long-term trend, which includes the nominate race of the species, has shown little change since 1980 (PECBMS 2012a).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	518	53	9	121		
	25	1985-2010	826	4	-15	42		
	10	2000-2010	1395	-21	-26	-13		

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	5	2005-2010	1542	-17	-23	-10		
CBC/BBS England	43	1967-2010	399	52	6	133		
	25	1985-2010	632	3	-19	39		
	10	2000-2010	1068	-24	-28	-20		
	5	2005-2010	1187	-21	-24	-16		
WBS/WBBS waterways	35	1975-2010	112	-68	-76	-61	>50	
	25	1985-2010	130	-45	-53	-32	>25	
	10	2000-2010	200	-32	-38	-23	>25	
	5	2005-2010	200	-26	-31	-17	>25	
BBS UK	15	1995-2010	1255	-11	-18	-5		
	10	2000-2010	1390	-20	-26	-13		
	5	2005-2010	1542	-18	-23	-10		
BBS England	15	1995-2010	958	-11	-16	-5		
	10	2000-2010	1064	-23	-27	-19		
	5	2005-2010	1187	-21	-25	-17		
BBS Scotland	15	1995-2010	129	-15	-33	-1		
	10	2000-2010	131	-21	-36	-3		
	5	2005-2010	143	-12	-27	9		
BBS Wales	15	1995-2010	114	-11	-26	4		
	10	2000-2010	127	-16	-29	-2		
	5	2005-2010	132	-23	-33	-13		
BBS N.Ireland	15	1995-2010	43	16				
	10	2000-2010	53	-4				
	5	2005-2010	58	-9				

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

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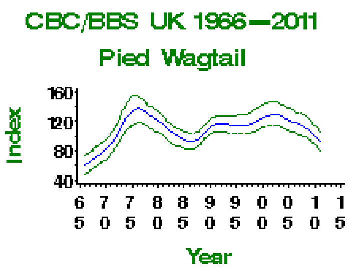
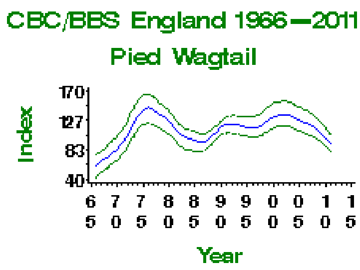
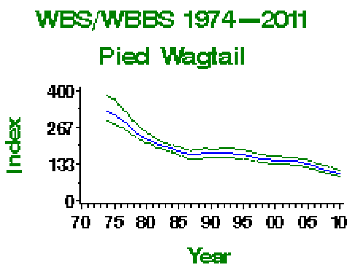


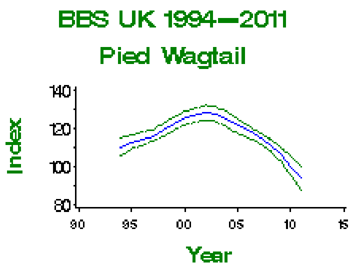
CBC/BBS UK graph



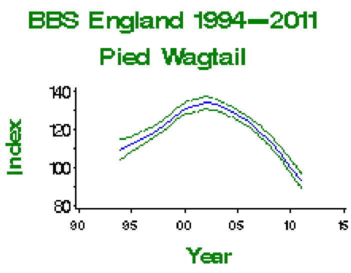
CBC/BBS England graph



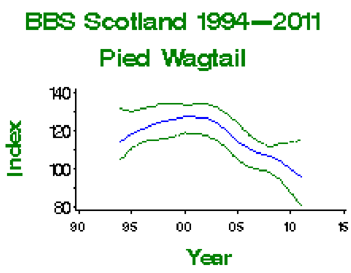
WBS/WBBS waterways graph



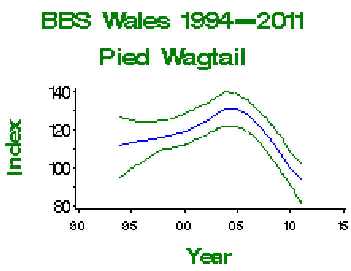
BBS UK graph



BBS England graph



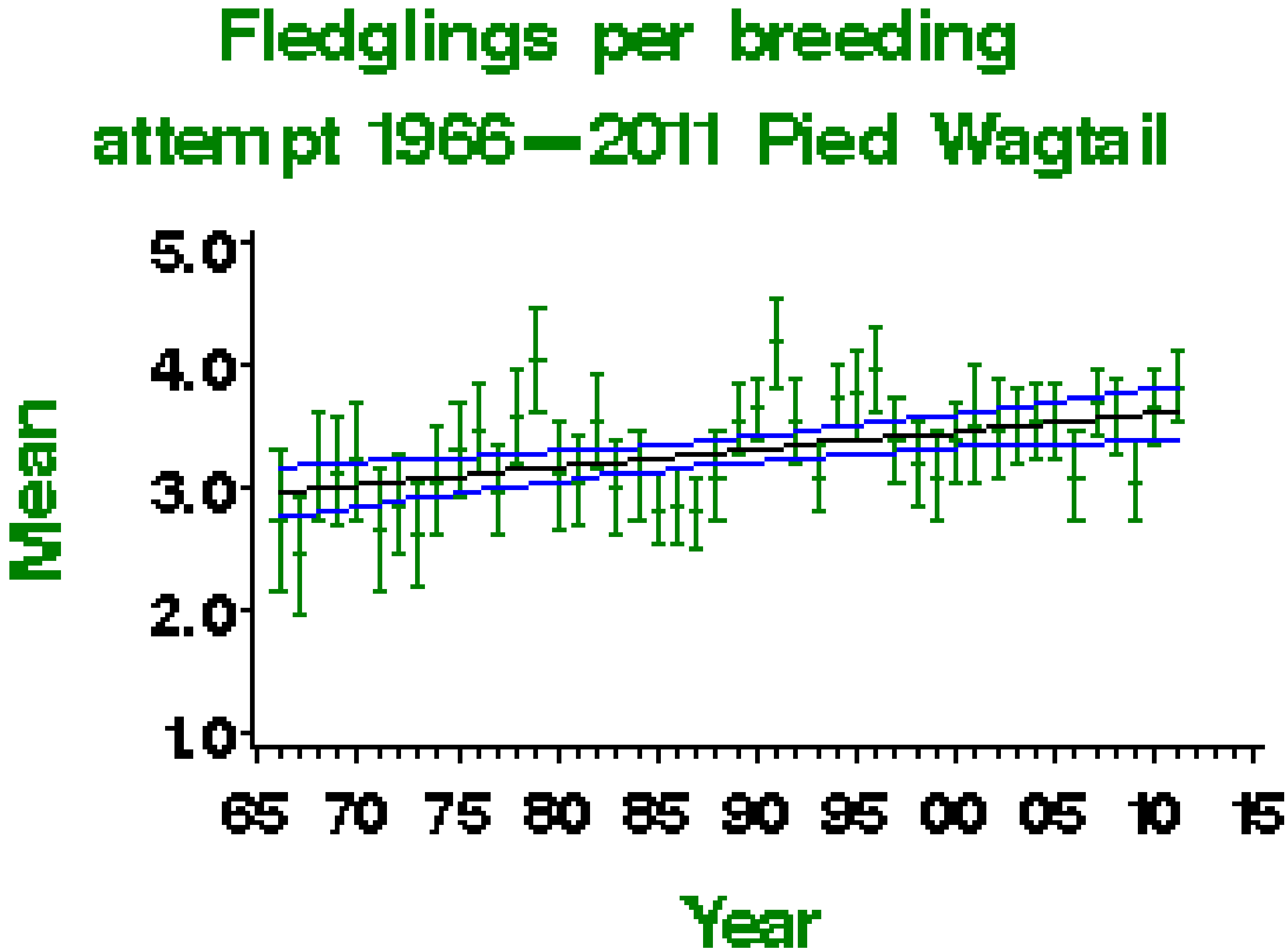
BBS Scotland graph



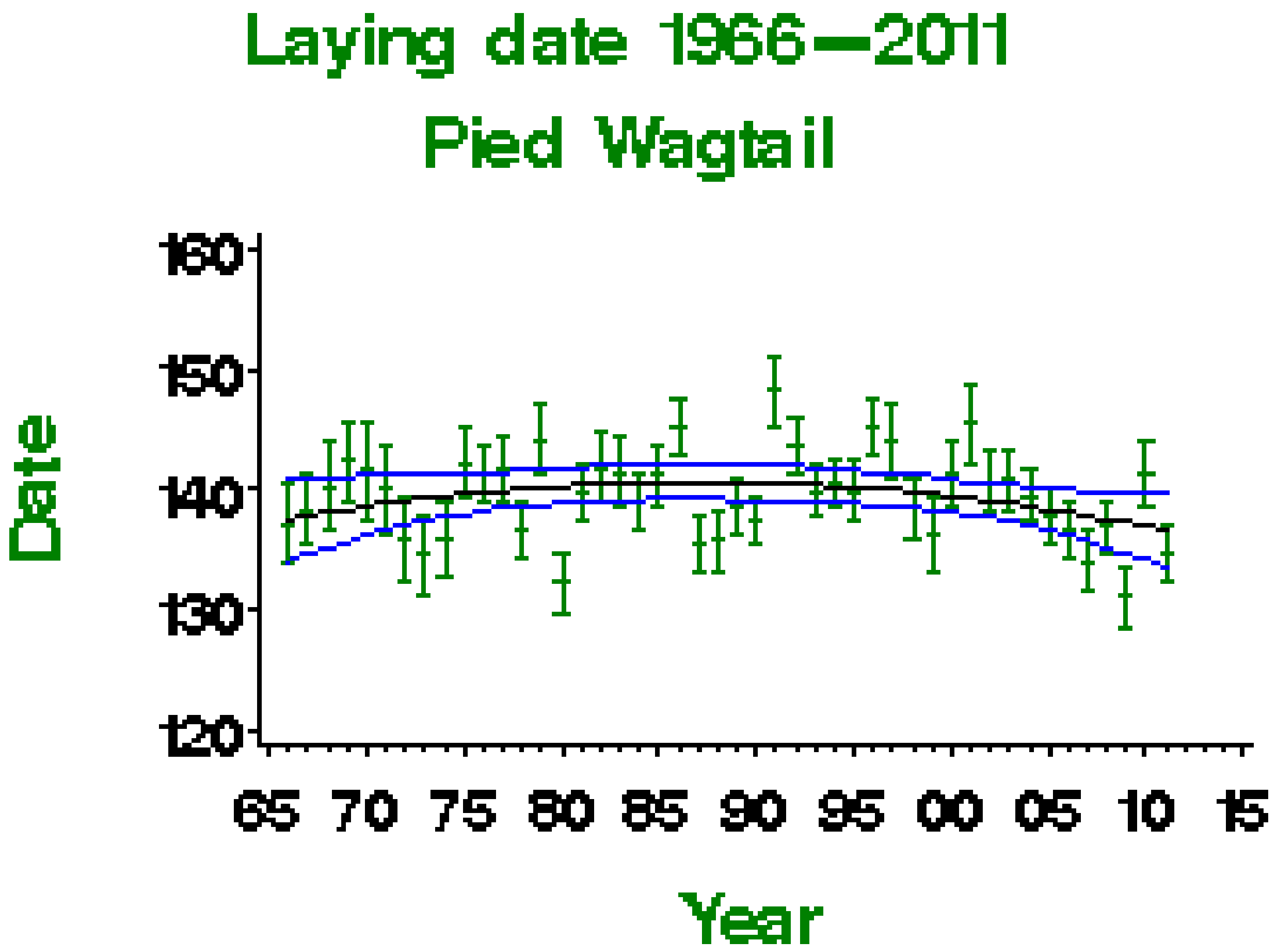
BBS Wales graph

BBS N.Ireland graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

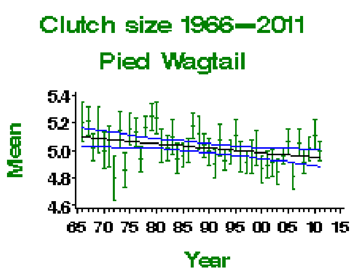


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

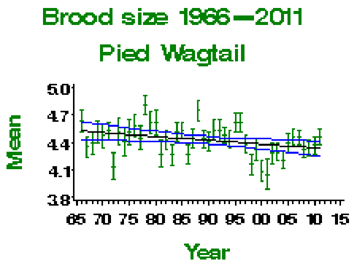
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	82	Linear increase	3.01 fledglings	3.61 fledglings	20.1%		
Clutch size	42	1968-2010	61	Linear decline	5.09 eggs	4.95 eggs	-2.8%		
Brood size	42	1968-2010	119	Linear decline	4.51 chicks	4.33 chicks	-4.0%		
Nest failure rate at egg stage	42	1968-2010	82	Linear decline	1.84% nests/day	0.67% nests/day	-63.6%		
Nest failure rate at chick stage	42	1968-2010	92	Linear decline	1.26% nests/day	0.80% nests/day	-36.5%		
Laying date	42	1968-2010	81	Curvilinear	May 18	May 17	-1 days		

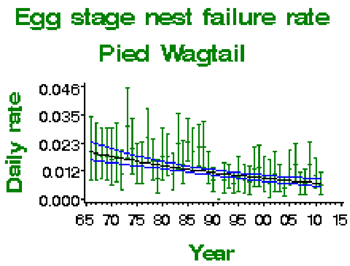
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



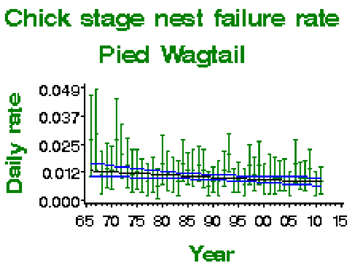
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



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Tree Pipit

Anthus trivialis

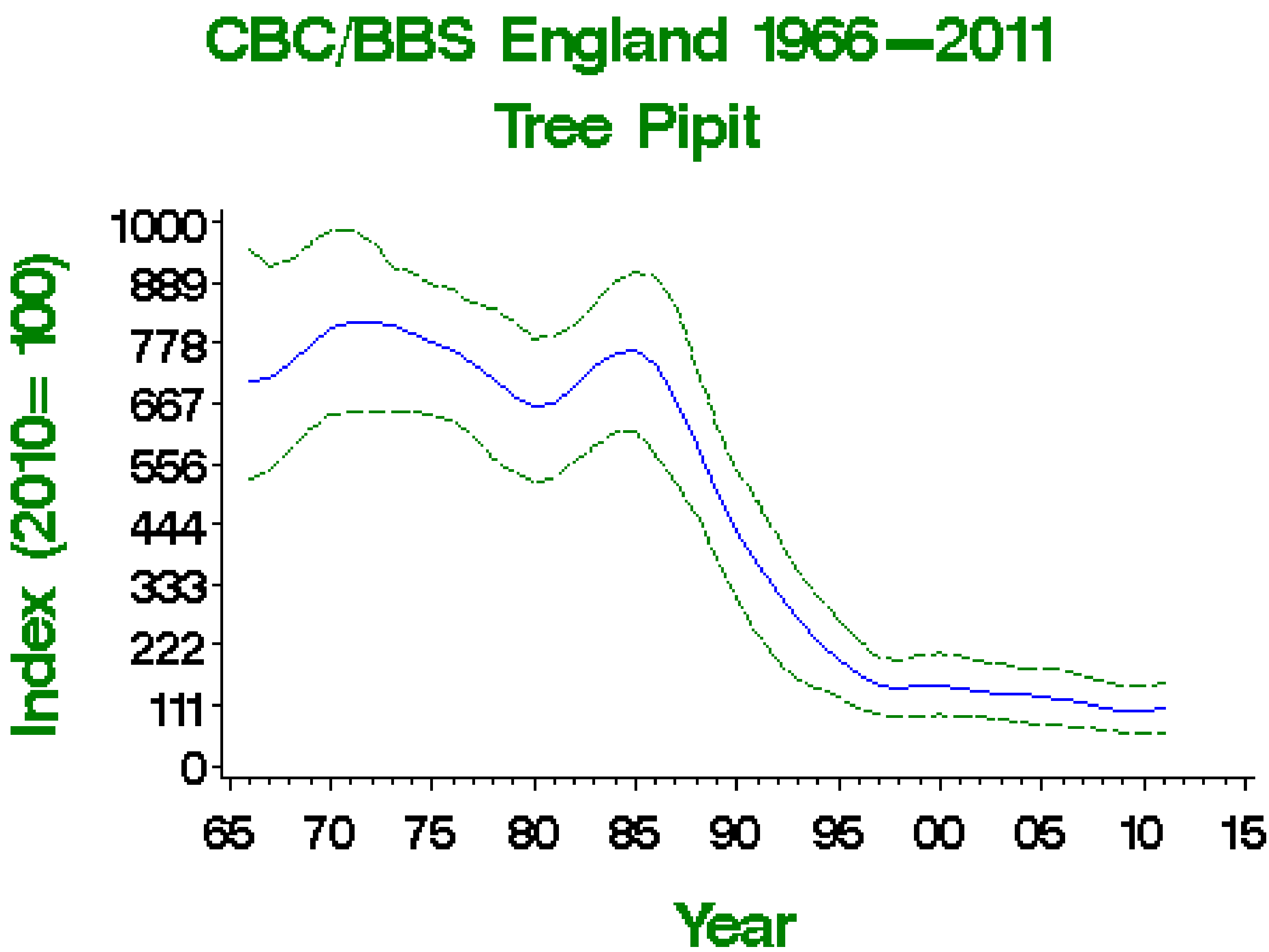
Key facts

Conservation listings:	Europe: no SPEC category (favourable conservation status in Europe, not concentrated in Europe) (BiE04) UK: red (>50% population decline) (BoCC3) UK Biodiversity Action Plan: priority species
Long-term trend:	England: rapid decline
Population size:	88,000 (55,000-121,000) pairs in 2009 (APEP13: distance sampling estimate for 2006 (Newson et al. 2008) updated using BBS trend)

Migrant status:	Long-distance migrant
Nesting habitat:	Ground nester
Primary breeding habitat:	Woodland
Secondary breeding habitat:	
Breeding diet:	Animal
Winter diet:	Animal

Status summary

Tree Pipits occur in greatest abundance in Wales, northern England and Scotland, and thus the marked CBC decline between the two atlas periods may reflect the range contraction that occurred then in central and southeast England (Gibbons et al. 1993). Since 1994, CBC/BBS data for the species have shown a further severe decrease, especially in England. Brood size has increased since 1966 whilst laying dates have become later, although better recording of replacement and second clutches in recent years may have influenced these trends. No information is available on productivity trends. Although the species has no European conservation listing as yet, numbers have shown widespread moderate decrease across Europe since 1980 (PECBMS 2012a), and the mean change across all European countries during the 1990s was a significant decline (Sanderson et al. 2006). The species was moved from the green to the amber list of UK Birds of Conservation Concern in 2002, and most recently to red, on the strength of its UK population decline (Eaton et al. 2009).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	43	1967-2010	48	-86	-94	-74	>50	
	25	1985-2010	57	-87	-93	-77	>50	Small CBC sample
	10	2000-2010	78	-33	-49	-13	>25	
	5	2005-2010	87	-20	-33	-5		
BBS UK	15	1995-2010	138	-5	-23	19		
	10	2000-2010	145	-13	-26	7		
	5	2005-2010	163	3	-14	23		
BBS England	15	1995-2010	74	-46	-63	-26	>25	
	10	2000-2010	78	-30	-47	-14	>25	
	5	2005-2010	87	-18	-31	-4		
BBS Scotland	15	1995-2010	32	72	20	118		
	10	2000-2010	35	8	-17	55		
	5	2005-2010	44	26	-11	75		
BBS Wales	15	1995-2010	32	-26	-47	2		
	10	2000-2010	33	-31	-52	-1	>25	
	5	2005-2010	33	-15	-39	14		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

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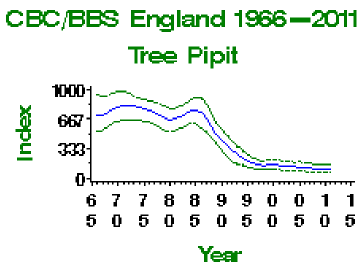
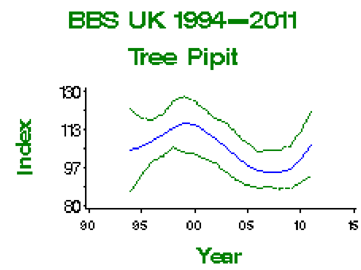
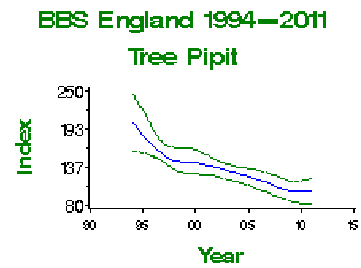


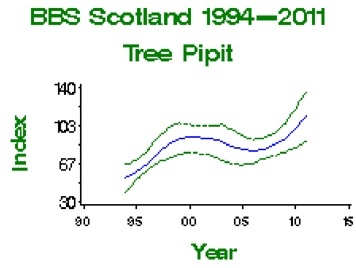
CBC/BBS England graph



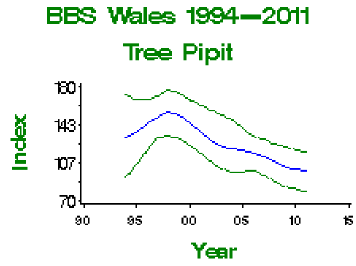
BBS UK graph



BBS England graph

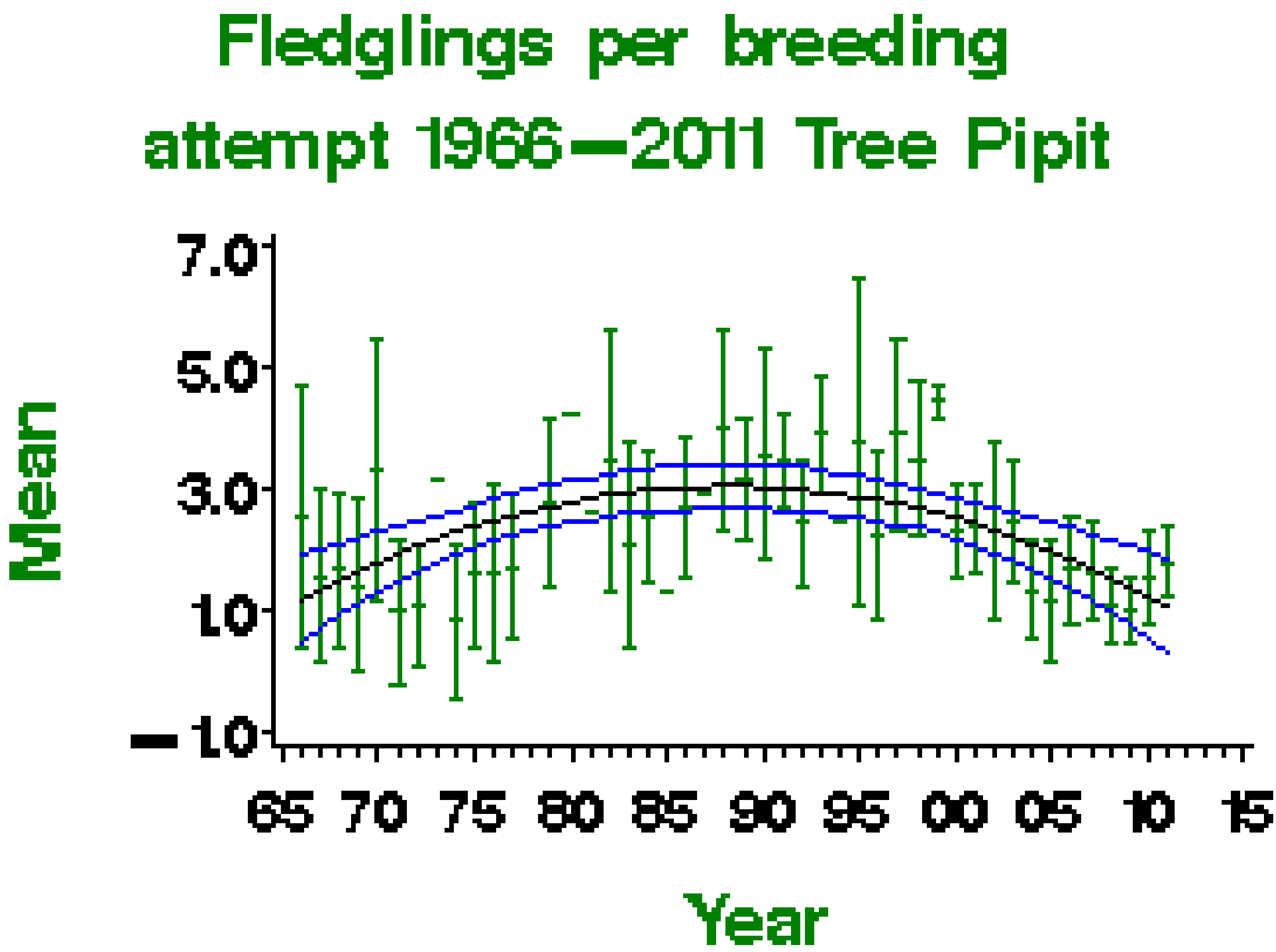


BBS Scotland graph

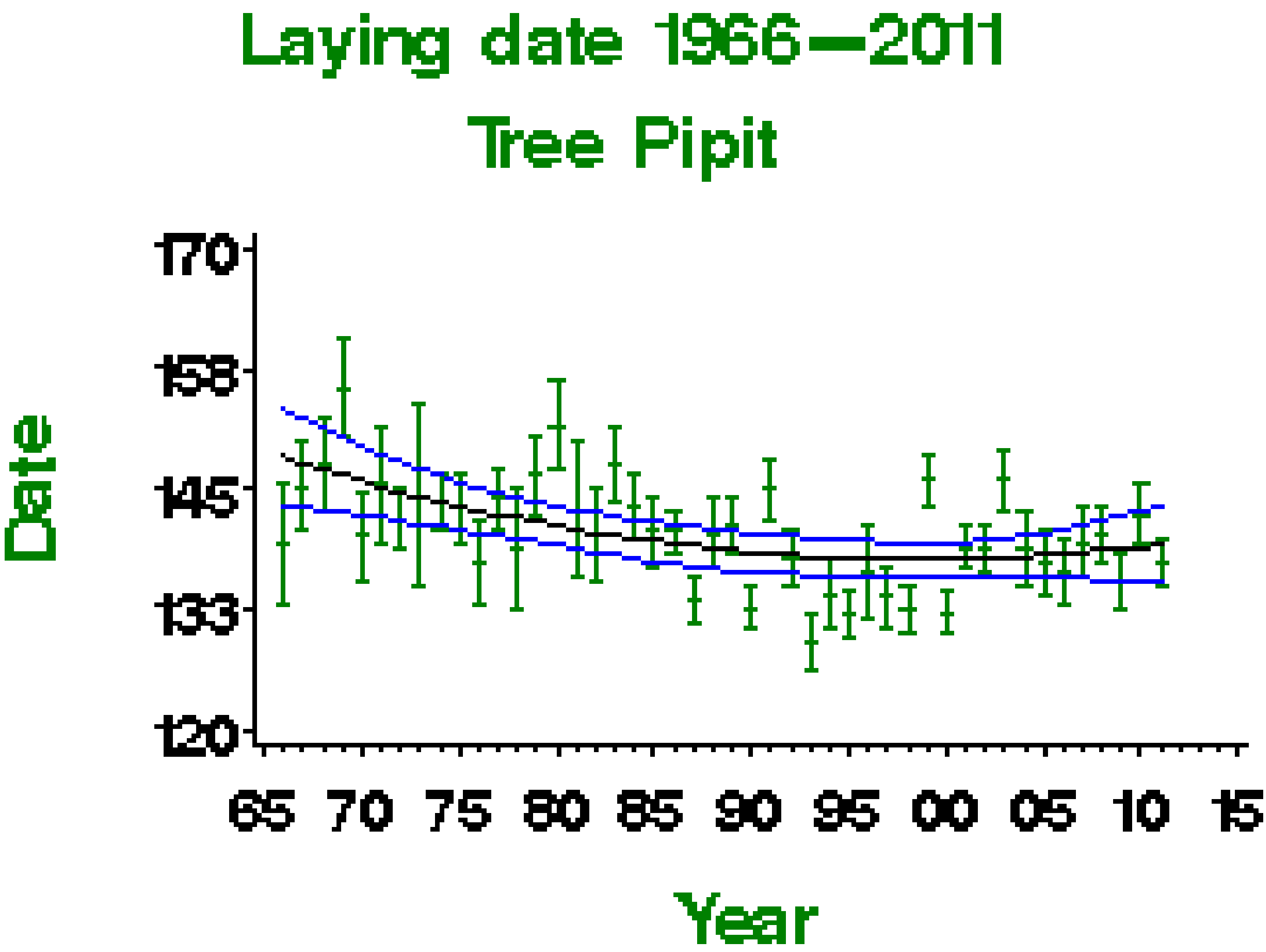


BBS Wales graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

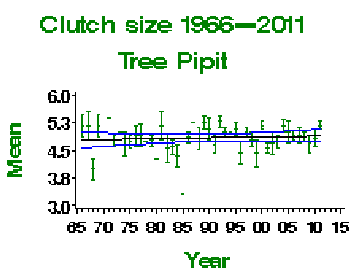


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

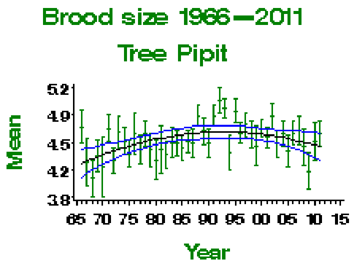
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	13	Curvilinear	1.52 fledglings	1.29 fledglings	-15.2%		
Clutch size	42	1968-2010	11	None					Small sample
Brood size	42	1968-2010	29	Curvilinear	4.29 chicks	4.47 chicks	4.1%		Small sample
Nest failure rate at egg stage	42	1968-2010	13	Curvilinear	5.05% nests/day	5.22% nests/day	3.4%		Small sample
Nest failure rate at chick stage	42	1968-2010	21	Curvilinear	3.35% nests/day	5.15% nests/day	53.7%		Small sample
Laying date	42	1968-2010	20	Curvilinear	May 27	May 19	-8 days		Small sample

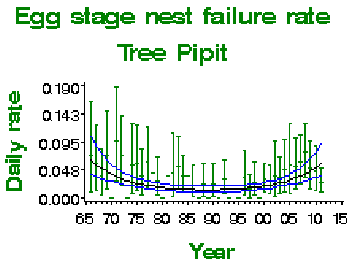
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



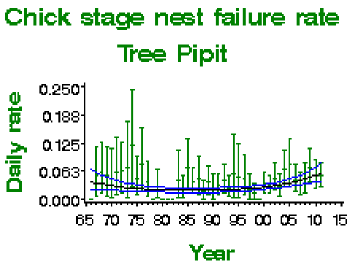
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

Causes of change

The availability of suitably structured habitat is important and lack of this may have contributed to the decline, possibly through a decrease in nest survival, although evidence for this is based largely on one site. This species being a long-distance migrant, problems on its wintering grounds should not be ruled out.

Change factor	Primary driver	Secondary driver
Demographic	Decreased breeding success	
Ecological	Changes in woodland	

Further information on causes of change

A detailed, eight-year study in Thetford Forest conducted by Burton (2009) provides good evidence that there was a significant decrease in daily nest survival during the chick stage and that overall nesting success was lowest in clearfells and recently planted stands. Overall nesting success appeared to be determined at the habitat scale, and Burton suggested that this may have been because the broad differences in cover between habitats affected the likelihood of nest predation (the main cause of nest failure). Charman et al. (2009) also found that Tree Pipits have high failure rates at the chick stage and implicate predation. It should be noted that records from Thetford Forest, in south-east England, probably contribute over half the nest records for this species each year: thus these trends may not be representative of the UK as a whole.

This species prefers open ground within woodlands and upland grazed woods lacking understorey, and also occupies clearfells, restocks, new plantations, heaths and commons where trees provide songposts (Fuller 1995, Burton 2007, Charman et al. 2009). The species' decline has been greatest in lowland England, particularly in the wider countryside in woodland and common land (Gibbons et al. 1993) and, accordingly, several authors have proposed that the population decline may be linked to the changing forest structure as new plantations mature, and the reduced management of lowland woods (Fuller et al. 2005, Amar et al. 2006, Charman et al. 2009). Data provided by the Repeat Woodland Bird Survey (RWBS) gives reliable evidence that sub-canopy vegetation increased markedly in almost all regions covered between the 1980s and the early 2000s and analyses found that declines of Tree Pipit occurred in woods with higher maximum tree height and increased foliage (Amar et al. 2006, Smart et al. 2007). Fuller & Moreton (1987) and Burton (2007) provide evidence, respectively, for associations with young coppice and, within coniferous plantations, for young restocks, and a disassociation with closed-canopy woodlands. Amar et al. (2006) state that the lack of new plantations and restocks in southern Britain may contribute to the decline of this species, although specific analyses providing evidence for this are lacking. They also found that Tree Pipit declined more in sites with more tracks, suggesting disturbance can be an issue (Amar et al. 2006, Smart et al. 2007). Targeted management, such as the provision of large blocks of habitat and the retention of mature trees for use as songposts, was found to be beneficial (Burton 2007).

In upland habitats, Fuller et al. (2006) provided evidence showing that both overgrazing and agricultural abandonment of marginal habitats may have detrimental effects on Tree Pipits.

Hewson et al. (2007) analysed the RWBS and BBS/CBC data and found declines in all of the seven long-distance migrant species considered, including Tree Pipit. Thus, although specific evidence relating to factors operating on wintering grounds is lacking, these causes cannot be ruled out as impacting upon population declines.

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

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Meadow Pipit

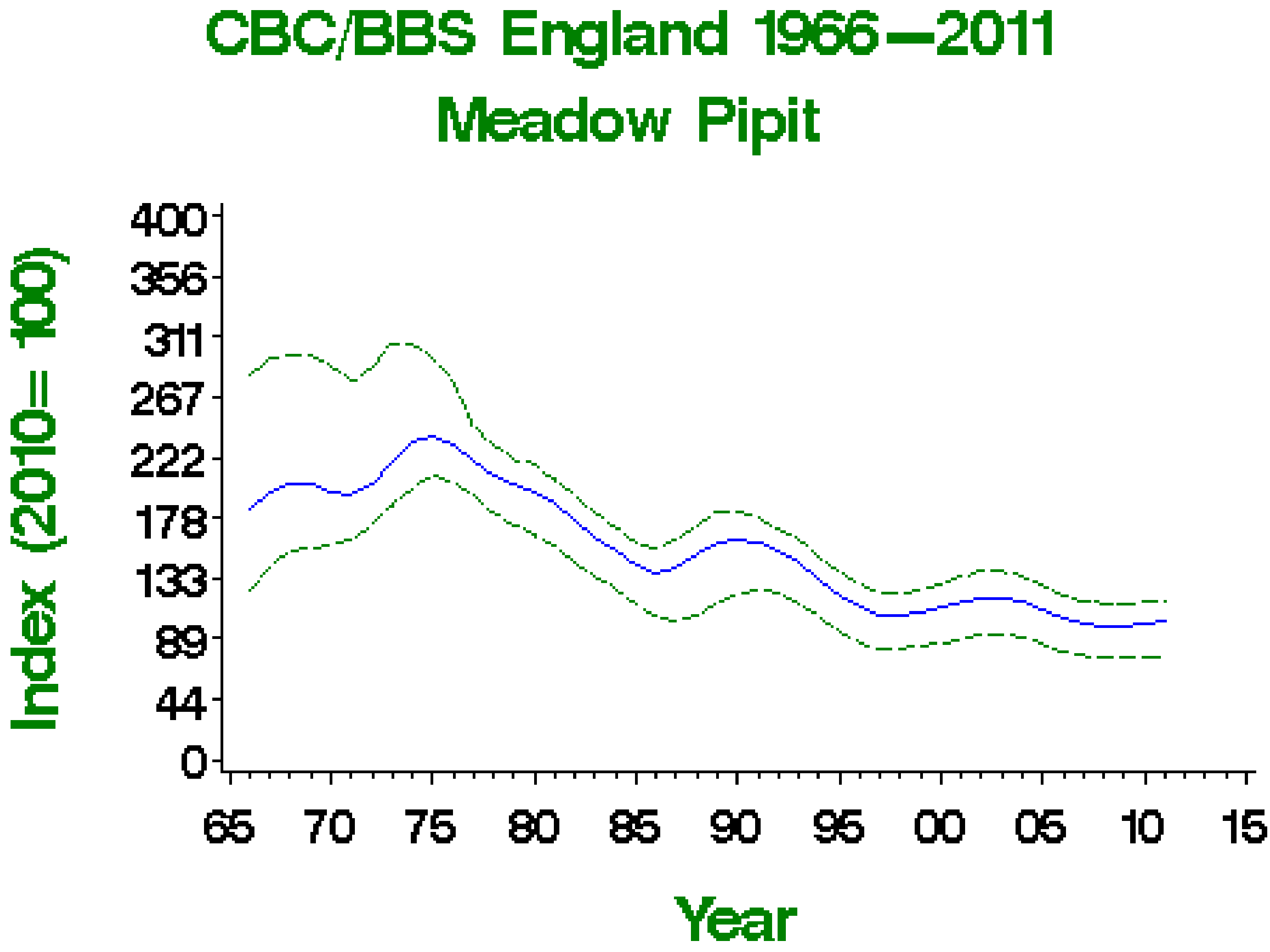
Anthus pratensis

Key facts

Conservation listings:	Europe: no SPEC category (concentrated in Europe, conservation status favourable) (BiE04) UK: amber (25-50% population decline) (BoCC3)
Long-term trend:	England: moderate decline
Population size:	2.0 (1.8-2.3) million pairs in 2009 (APEP13: distance sampling estimate for 2006 (Newson et al. 2008) updated using BBS trend)

Status summary

The CBC/BBS trend has been downward since the mid 1970s, accompanied by a range contraction from lowland England (Gibbons et al. 1993). Moorland, the key Meadow Pipit habitat, was not covered well by the CBC, leading to some doubt about the significance of the early results for this species, but BBS now provides more representative monitoring and has enabled the species to move from the green to the amber list. The BBS map of change in relative density between 1994-96 and 2007-09 indicates that the species has decreased throughout the core of its UK range in Scotland, Northern Ireland and northern England but that numbers have increased in some southern regions. Meadow Pipits are partial migrants and conditions on the Iberian wintering grounds have been linked to the decline, as have losses of marginal land from parts of the breeding range (Gibbons et al. 1993). Experiments in central Scotland have indicated that Meadow Pipit breeding abundance can be improved by reduced grazing intensity and by mixing cattle and sheep (Evans et al. 2006). Nest failure rates during the 12-day nestling stage have declined markedly, which may reflect the loss of birds from suboptimal habitat, but no trend is evident in the number of fledglings per breeding attempt. A trend towards earlier laying is probably related to climate change (Crick & Sparks 1999). A widespread moderate decline is evident across Europe since 1980 (PECBMS 2012a).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

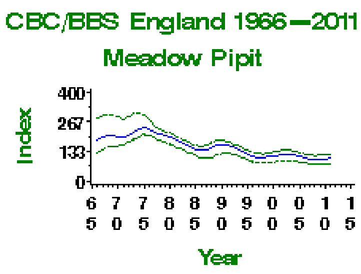
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	43	1967-2010	183	-49	-74	-22	>25	
	25	1985-2010	286	-30	-44	-11	>25	

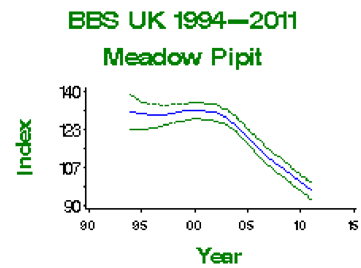
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	5	2005-2010	591	-9	-16	-4		
BBS UK	15	1995-2010	799	-23	-29	-16		
	10	2000-2010	875	-24	-28	-18		
	5	2005-2010	1004	-16	-20	-13		
BBS England	15	1995-2010	433	-16	-26	-5		
	10	2000-2010	492	-11	-22	-1		
	5	2005-2010	591	-9	-15	-4		
BBS Scotland	15	1995-2010	200	-32	-40	-24	>25	
	10	2000-2010	193	-28	-35	-22	>25	
	5	2005-2010	208	-17	-22	-11		
BBS Wales	15	1995-2010	86	-13	-22	-1		
	10	2000-2010	96	-24	-33	-14		
	5	2005-2010	97	-20	-26	-14		
BBS N.Ireland	15	1995-2010	65	-21	-33	2		
	10	2000-2010	75	-44	-51	-37	>25	
	5	2005-2010	77	-48	-51	-39	>25	

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

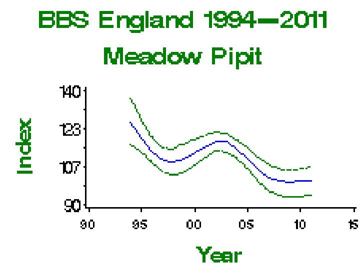
BTO JNCC rspb The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



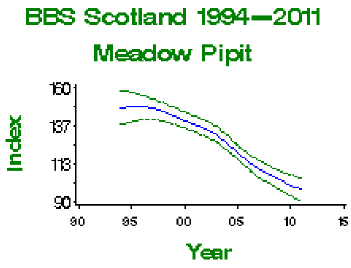
CBC/BBS England graph



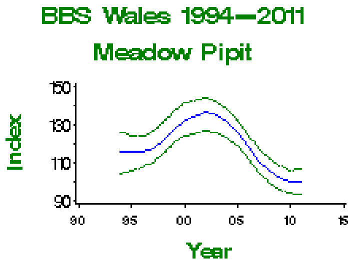
BBS UK graph



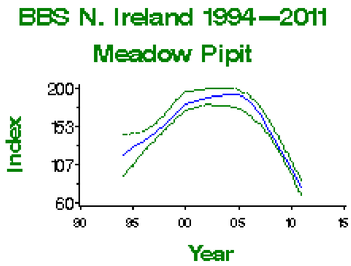
BBS England graph



BBS Scotland graph

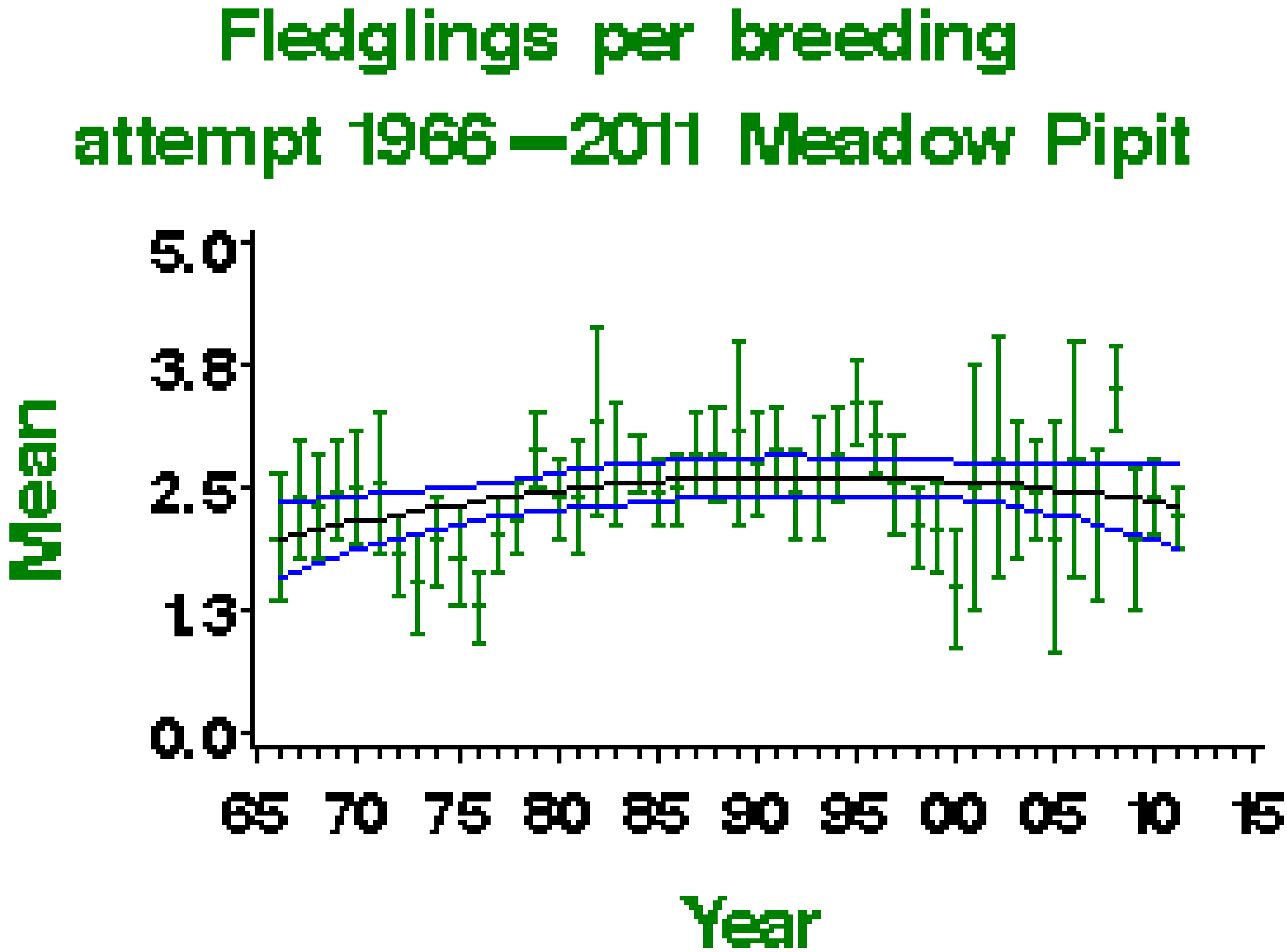


BBS Wales graph

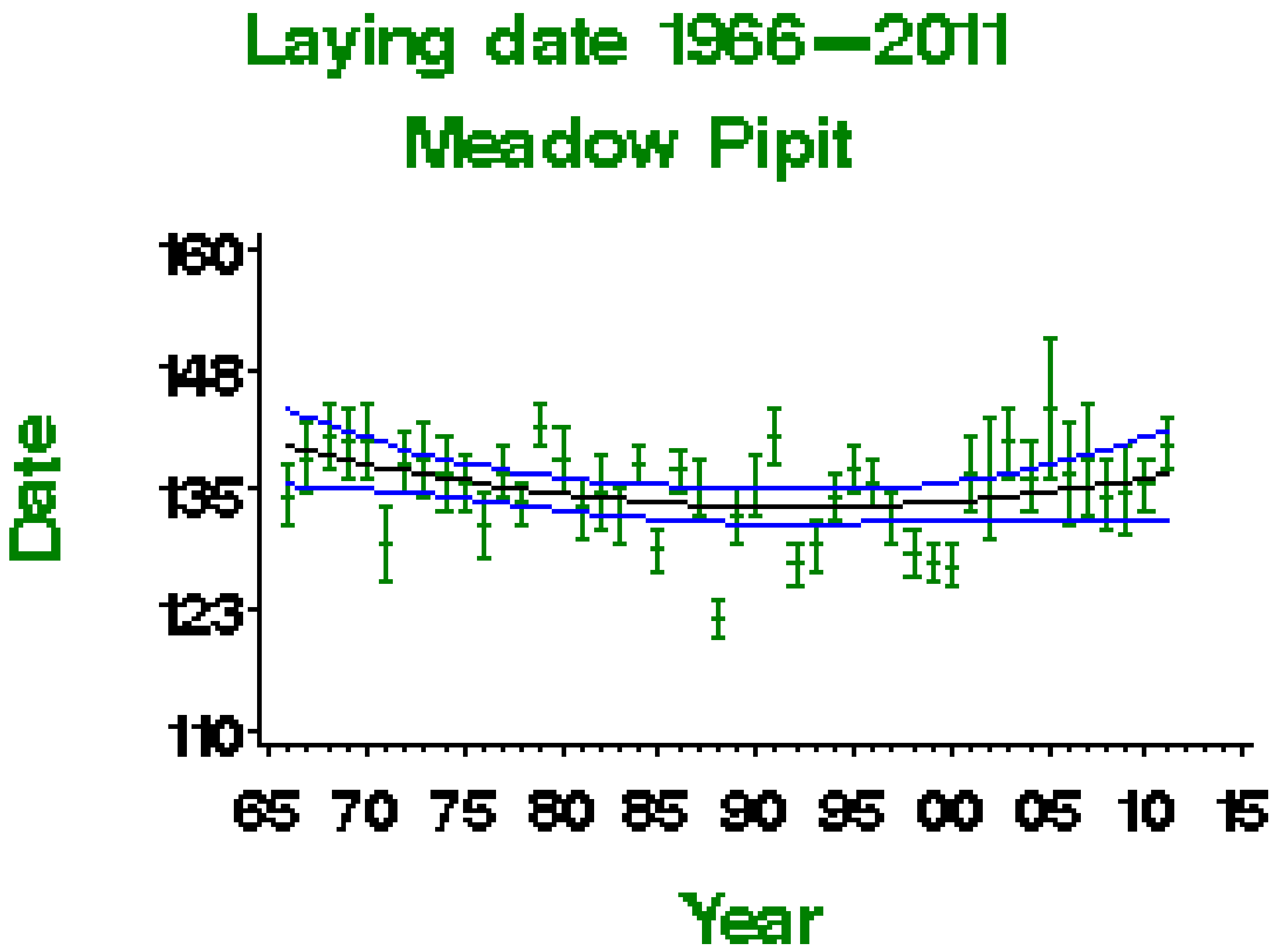


BBS N.Ireland graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

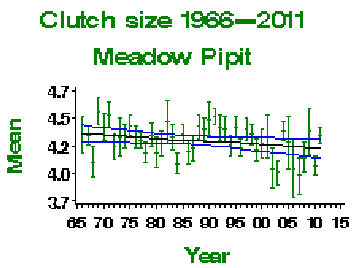


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

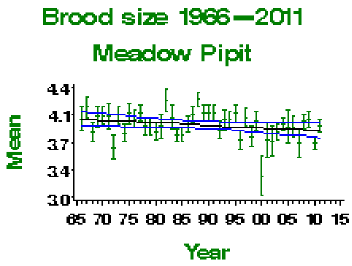
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	44	Curvilinear	2.07 fledglings	2.37 fledglings	14.4%		
Clutch size	42	1968-2010	35	None					
Brood size	42	1968-2010	71	None					
Nest failure rate at egg stage	42	1968-2010	44	None					
Nest failure rate at chick stage	42	1968-2010	62	Linear decline	2.59% nests/day	1.10% nests/day	-57.5%		
Laying date	42	1968-2010	37	Curvilinear	May 19	May 16	-3 days		

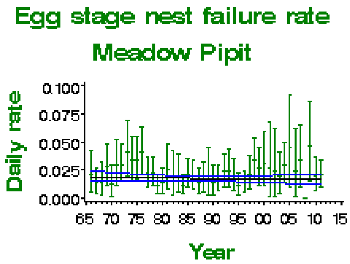
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



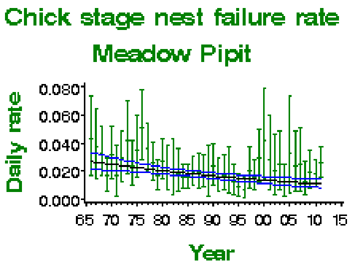
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

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Chaffinch

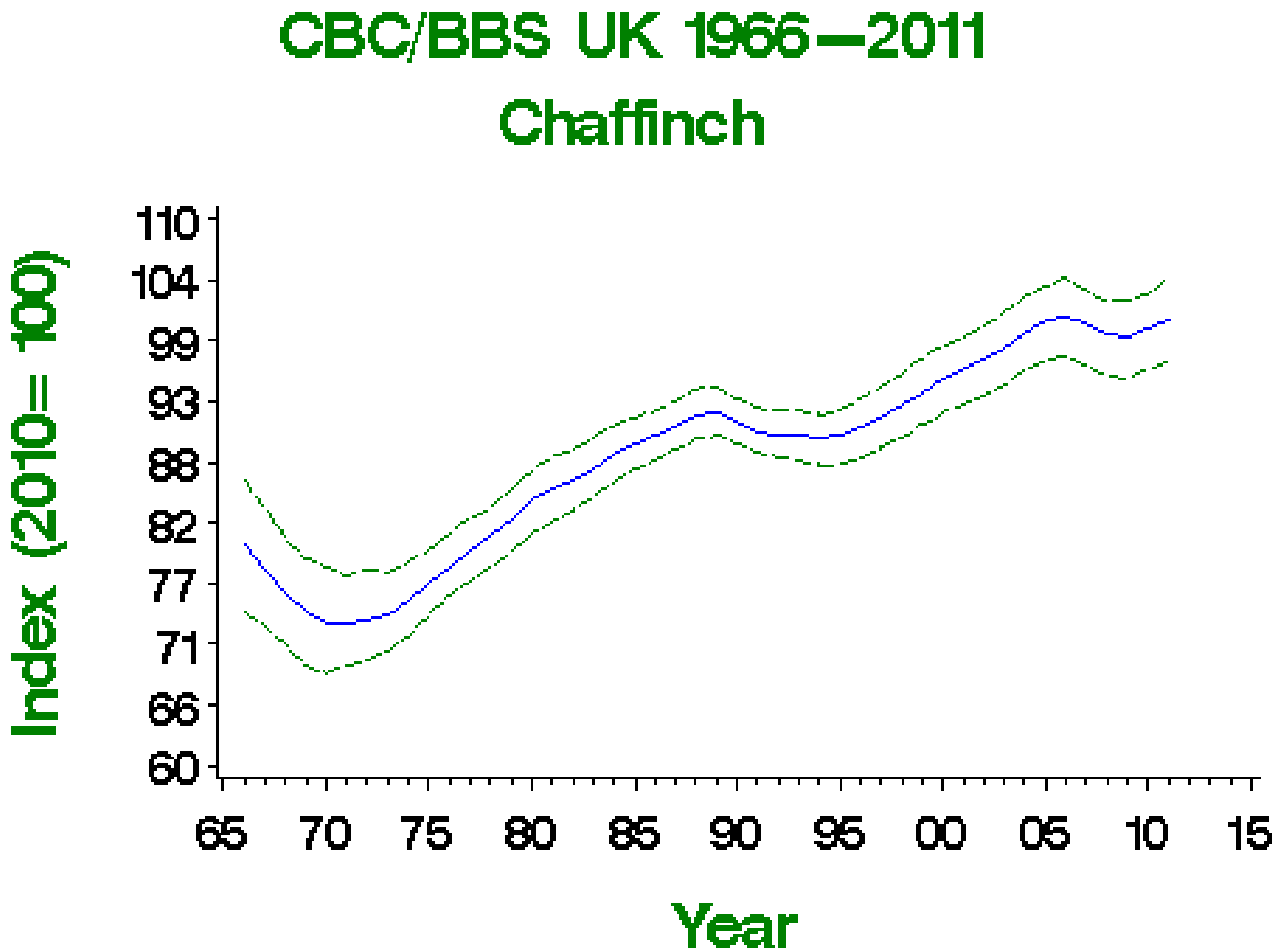
Fringilla coelebs

Key facts

Conservation listings:	Europe: no SPEC category (concentrated in Europe, conservation status favourable) (BiE04) UK: green (species level); amber (race gengleri, >20% of European breeders) (BoCC3)
Long-term trend:	UK, England: shallow increase
Population size:	6.2 million territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Status summary

Chaffinch abundance has increased rapidly since the early 1970s, according to CBC/BBS and CES, but numbers seemed to stabilise for a period during the 1990s. This relative stability was associated with a reduction in annual survival, which could be density-dependent (Siriwardena et al. 1999). There was also some evidence of improved breeding performance during the early years of population increase, with larger broods, fewer egg-stage nest failures, and more fledglings per breeding attempt, but these trends are now reversed. The BBS Robinson et al. 2010). The trend towards earlier laying may be partly explained by recent climate change (Crick & Sparks 1999). Chaffinches are well adapted to suburban and garden habitats, as well as to highly fragmented woodland and hedgerows, occurring less in the open-field, arable habitats that have been affected most by agricultural intensification, so it is possible that they have benefited by environmental changes from which other seed-eating passerines have suffered. Numbers have shown widespread moderate increase across Europe since 1980, though with little change since 1990 (PECBMS 2012a).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

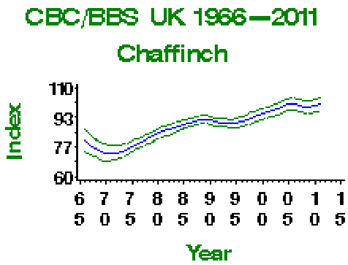
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	1047	28	15	43		
	25	1985-2010	1644	12	5	18		
	10	2000-2010	2726	5	2	8		

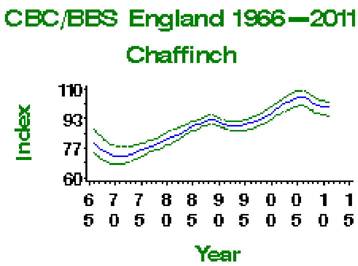
	5	2005-2010	3096	-1	-3	2		
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	43	1967-2010	829	36	14	44		
	25	1985-2010	1292	12	5	19		
	10	2000-2010	2131	3	0	6		
	5	2005-2010	2437	-5	-7	-3		
CES adults	26	1984-2010	78	8	-39	74		
	25	1985-2010	80	5	-36	62		
	10	2000-2010	87	-9	-25	7		
	5	2005-2010	84	-17	-27	-6		
CES juveniles	26	1984-2010	61	51	-13	157		
	25	1985-2010	62	83	14	210		
	10	2000-2010	69	110	48	170		
	5	2005-2010	66	25	-5	57		
BBS UK	15	1995-2010	2428	12	8	15		
	10	2000-2010	2710	5	2	8		
	5	2005-2010	3096	0	-3	2		
BBS England	15	1995-2010	1865	12	8	16		
	10	2000-2010	2076	3	1	6		
	5	2005-2010	2368	-4	-6	-2		
BBS Scotland	15	1995-2010	238	15	5	27		
	10	2000-2010	254	14	3	23		
	5	2005-2010	298	10	2	17		
BBS Wales	15	1995-2010	197	-4	-16	10		
	10	2000-2010	222	5	-4	15		
	5	2005-2010	234	-1	-8	7		
BBS N.Ireland	15	1995-2010	89	41	7	56		
	10	2000-2010	103	-11	-22	1		
	5	2005-2010	111	-2	-8	5		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

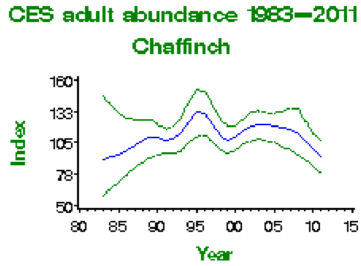
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



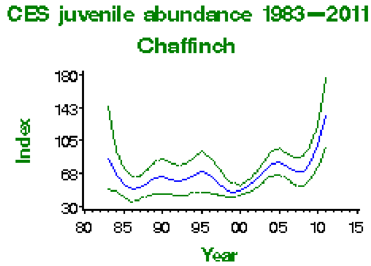
CBC/BBS UK graph



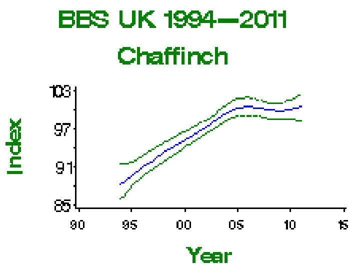
CBC/BBS England graph



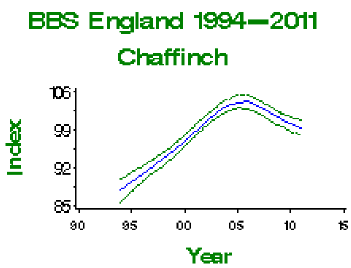
CES adults graph



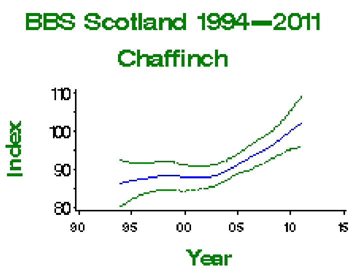
CES juveniles graph



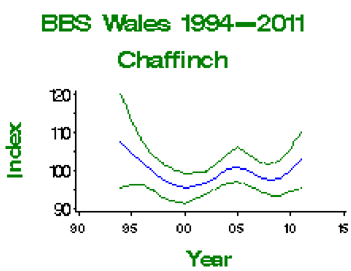
BBS UK graph



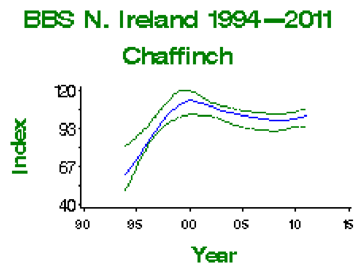
BBS England graph



BBS Scotland graph

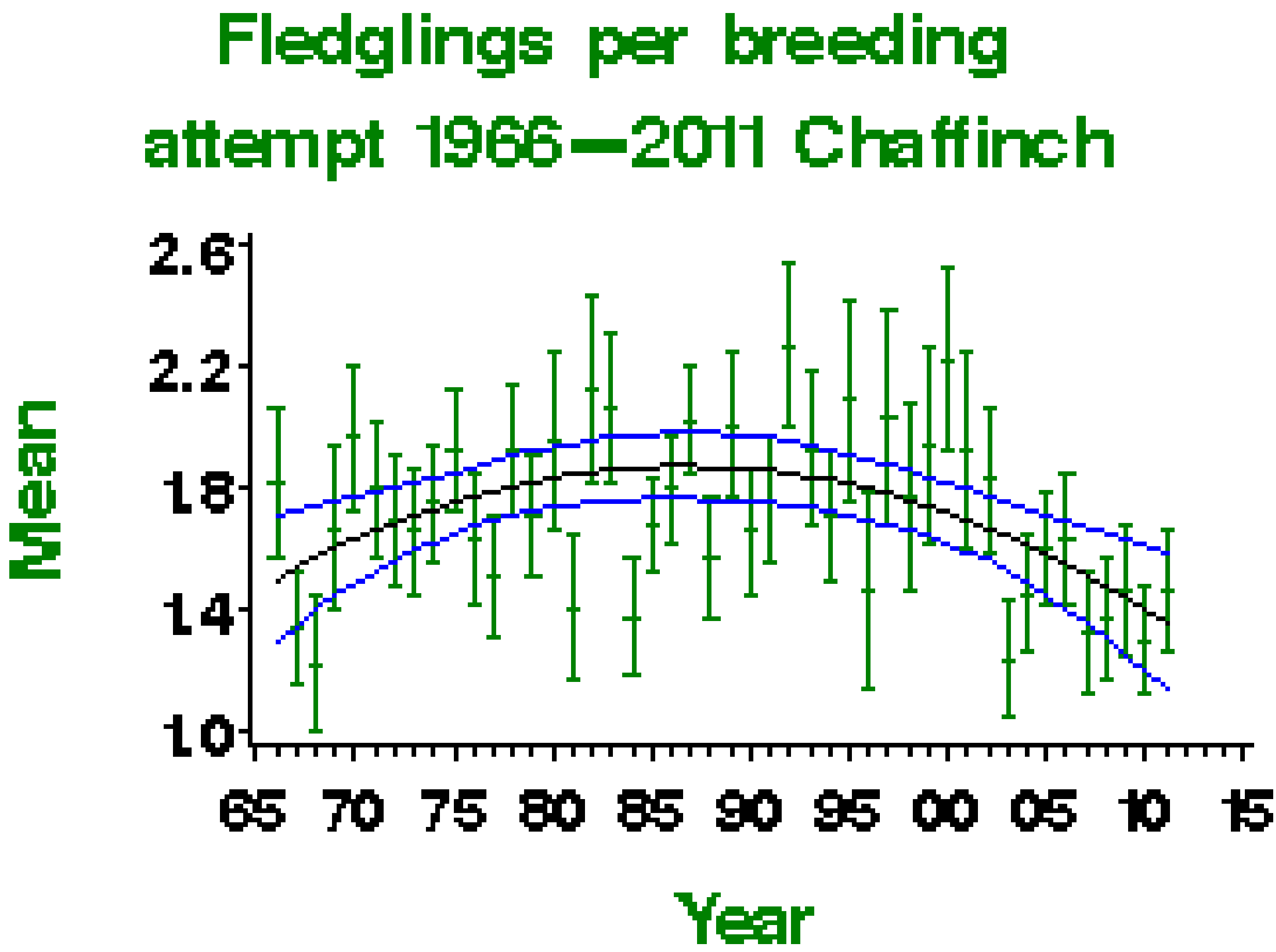


BBS Wales graph

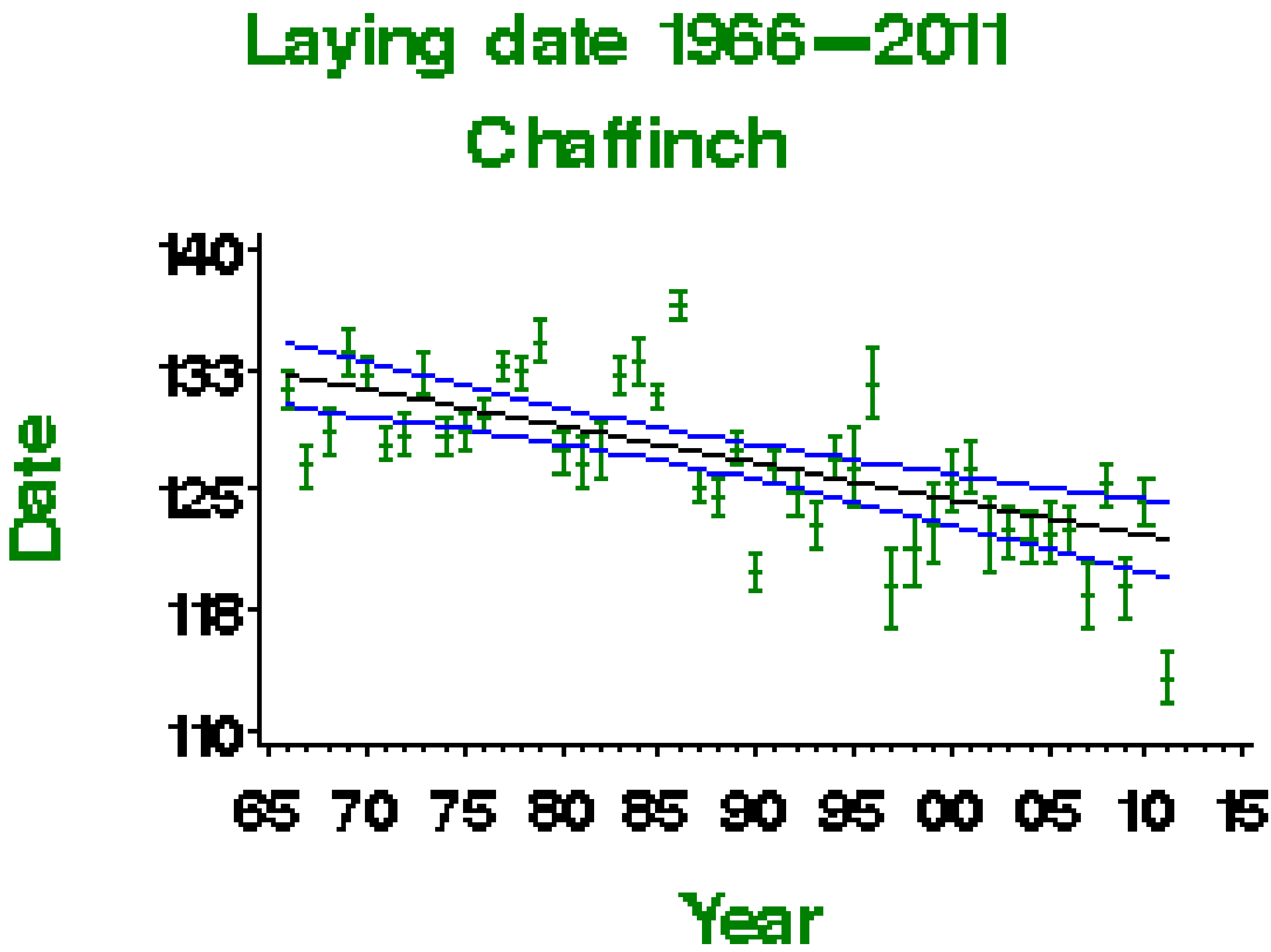


BBS N.Ireland graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

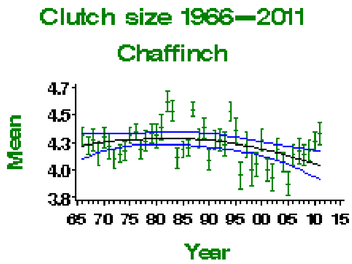


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

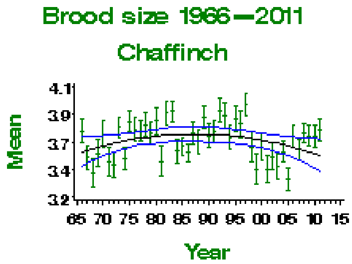
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	114	Curvilinear	1.57 fledglings	1.41 fledglings	-10.4%		
Clutch size	42	1968-2010	86	Curvilinear	4.23 eggs	4.07 eggs	-3.8%		
Brood size	42	1968-2010	139	Curvilinear	3.60 chicks	3.56 chicks	-1.1%		
Nest failure rate at egg stage	42	1968-2010	164	Curvilinear	3.04% nests/day	3.84% nests/day	26.3%		
Nest failure rate at chick stage	42	1968-2010	114	Curvilinear	3.00% nests/day	3.12% nests/day	4.0%		
Laying date	42	1968-2010	107	Linear decline	May 12	May 2	-10 days		
Juvenile to Adult ratio (CES)	26	1984-2010	84	Smoothed trend	43 Index value	100 Index value	134%		
Juvenile to Adult ratio (CES)	25	1985-2010	86	Smoothed trend	53 Index value	100 Index value	90%		
Juvenile to Adult ratio (CES)	10	2000-2010	95	Smoothed trend	66 Index value	100 Index value	51%		
Juvenile to Adult ratio (CES)	5	2005-2010	90	Smoothed trend	88 Index value	100 Index value	13%		

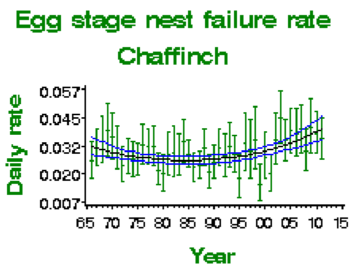
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



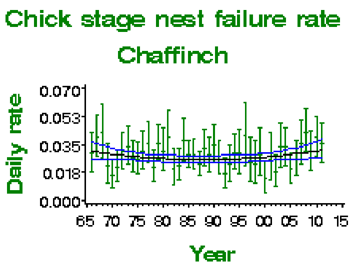
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



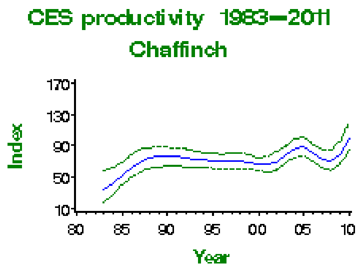
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



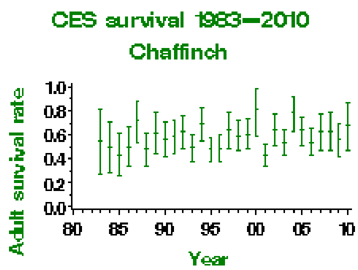
Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Smoothed long-term trend in ratio of juvenile:adult birds caught - green lines indicate 85% confidence limits



Proportion of adult birds surviving to following year - green bars represent 95% confidence limits

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Greenfinch

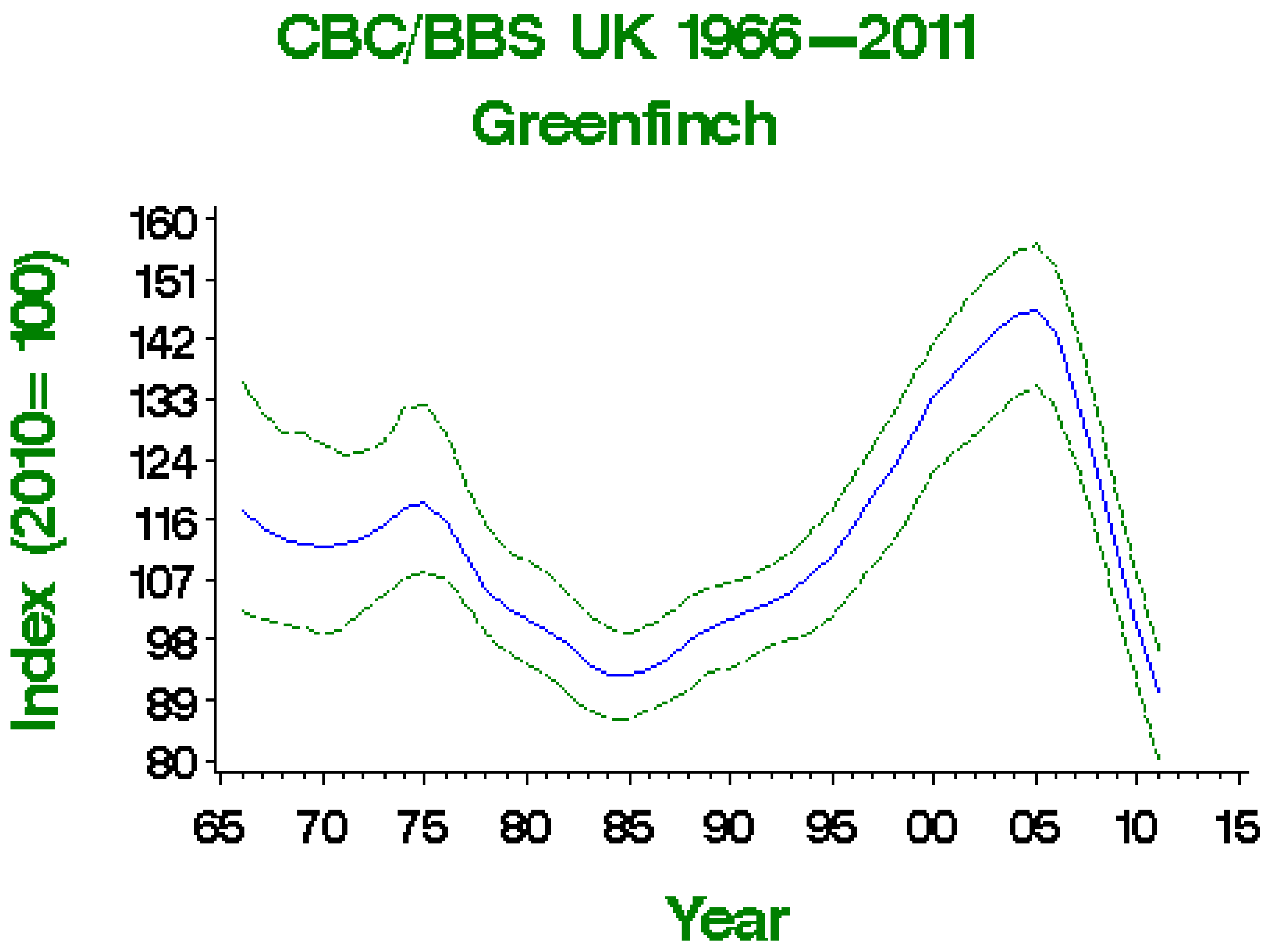
Chloris chloris

Key facts

Conservation listings:	Europe: no SPEC category (concentrated in Europe, conservation status favourable) (BiE04) UK: green (species level, race chloris); amber (race harrisoni, >20% of European breeders) (BoCC3)
Long-term trend:	UK, England: fluctuating, with no long-term trend
Population size:	1.7 (1.6-1.8) million pairs in 2009 (APEP13: distance sampling estimate for 2006 (Newson et al. 2008) updated using BBS trend)

Status summary

Greenfinch abundance varied little up to the mid 1990s, and there was little change in either survival or breeding performance during this period (Siriwardena et al. 1998b, 2000b). More recent CBC/BBS data indicate population increases widely across the UK, followed by a sudden sharp fall induced by a widespread and severe outbreak of trichomonosis that began in 2005 (Robinson et al. 2010b, Lawson et al. 2012b). The BBS Crick & Sparks 1999). There has been little long-term change across Europe since 1980 (PECBMS 2012a).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

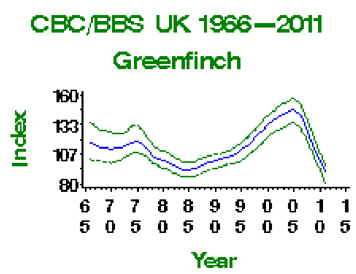
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	757	-13	-31	6		
	25	1985-2010	1192	8	-7	23		
	10	2000-2010	2033	-25	-29	-22	>25	
	5	2005-2010	2291	-32	-34	-29	>25	
CBC/BBS England	43	1967-2010	640	-6	-29	22		

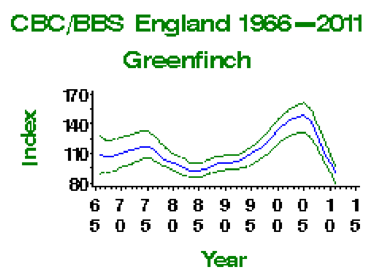
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	25	1985-2010	1006	8	-9	27		
	10	2000-2010	1704	-25	-28	-21	>25	
	5	2005-2010	1926	-33	-34	-30	>25	
CES adults	26	1984-2010	41	13	-47	155		
	25	1985-2010	42	-6	-53	95		
	10	2000-2010	49	-33	-51	-16	>25	
	5	2005-2010	49	-37	-50	-28	>25	
CES juveniles	26	1984-2010	29	190	15	694		
	25	1985-2010	30	153	12	540		
	10	2000-2010	39	158	43	273		
	5	2005-2010	39	40	-5	84		
BBS UK	15	1995-2010	1776	-9	-13	-2		
	10	2000-2010	2001	-25	-28	-22	>25	
	5	2005-2010	2254	-31	-33	-28	>25	
BBS England	15	1995-2010	1495	-8	-12	-2		
	10	2000-2010	1680	-25	-28	-21		
	5	2005-2010	1901	-31	-33	-29	>25	
BBS Scotland	15	1995-2010	104	-14	-31	3		
	10	2000-2010	114	-20	-36	-1		
	5	2005-2010	130	-21	-30	-6		
BBS Wales	15	1995-2010	113	-3	-23	20		
	10	2000-2010	131	-27	-38	-14	>25	
	5	2005-2010	139	-30	-38	-21	>25	
BBS N.Ireland	15	1995-2010	51	-3	-35	49		
	10	2000-2010	62	-46	-58	-33	>25	
	5	2005-2010	68	-52	-58	-41	>50	

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

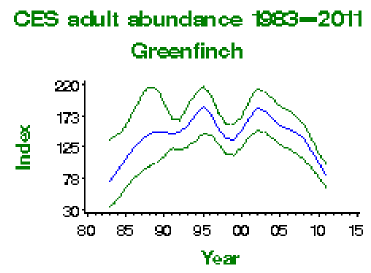
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



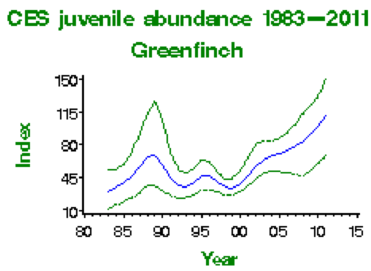
CBC/BBS UK graph



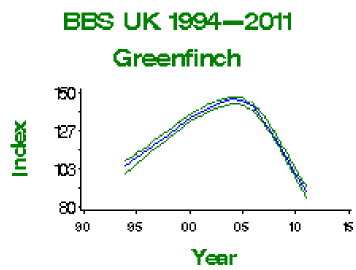
CBC/BBS England graph



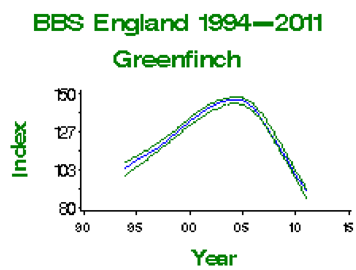
CES adults graph



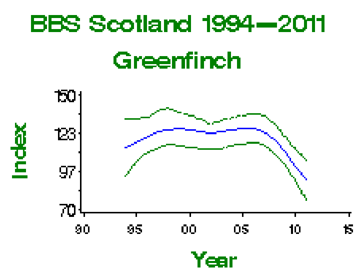
CES juveniles graph



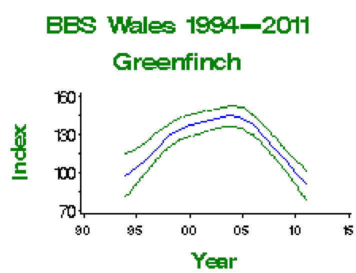
BBS UK graph



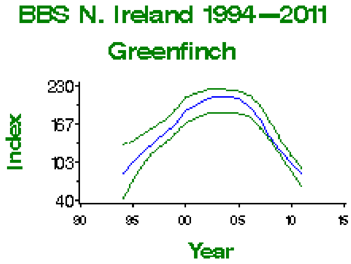
BBS England graph



BBS Scotland graph

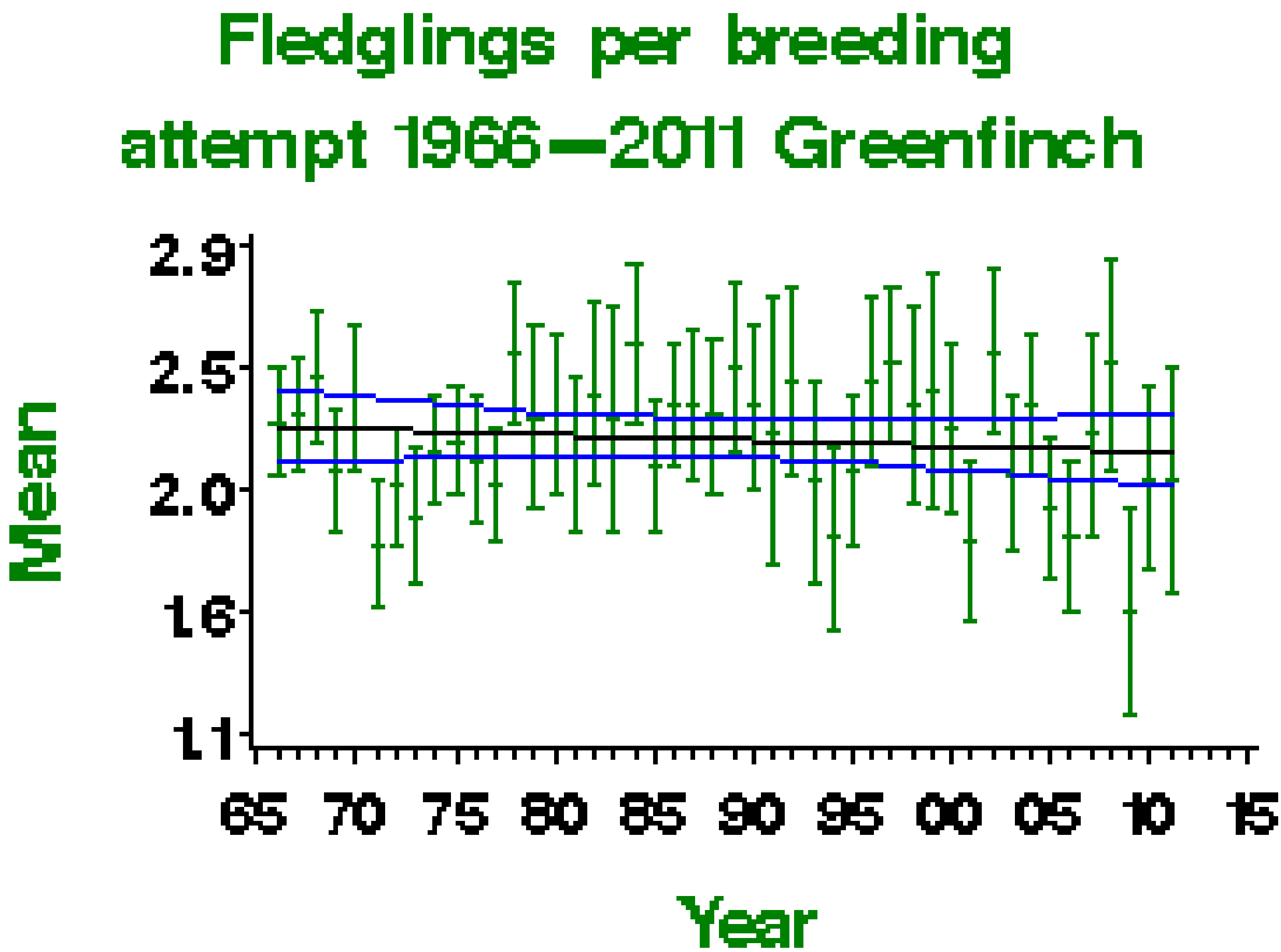


BBS Wales graph

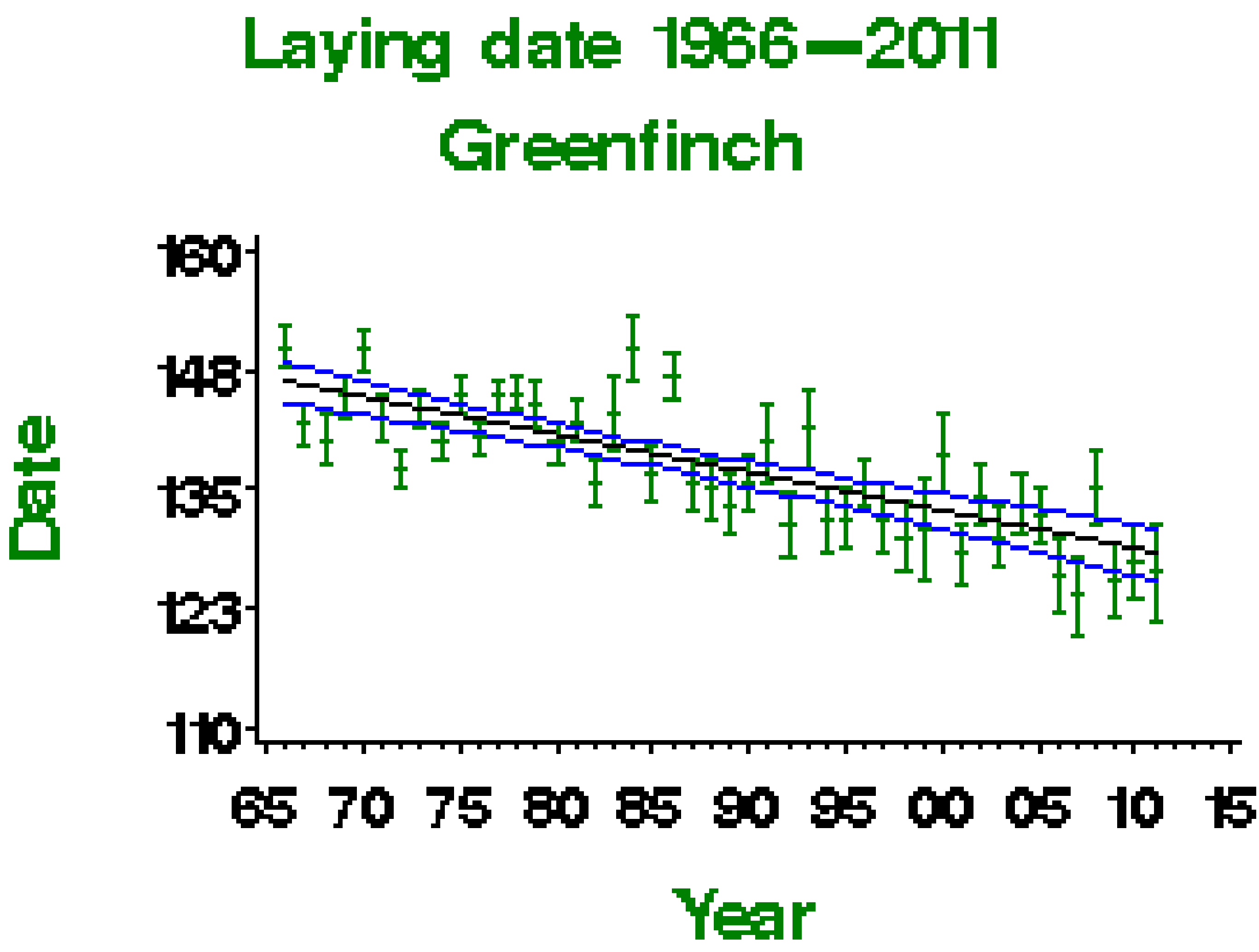


BBS N.Ireland graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

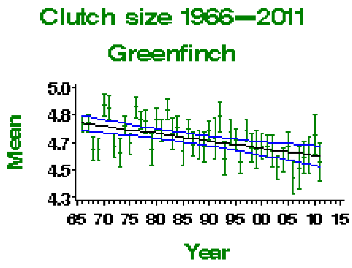


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

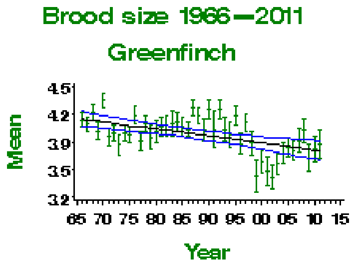
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	93	None					
Clutch size	42	1968-2010	90	Linear decline	4.77 eggs	4.57 eggs	-4.1%		
Brood size	42	1968-2010	112	Linear decline	4.10 chicks	3.76 chicks	-8.4%		
Nest failure rate at egg stage	42	1968-2010	125	Linear decline	2.47% nests/day	1.60% nests/day	-35.2%		
Nest failure rate at chick stage	42	1968-2010	93	None					
Laying date	42	1968-2010	92	Linear decline	May 25	May 9	-16 days		
Juvenile to Adult ratio (CES)	26	1984-2010	46	Smoothed trend	98 Index value	100 Index value	2%		
Juvenile to Adult ratio (CES)	25	1985-2010	47	Smoothed trend	70 Index value	100 Index value	43%		
Juvenile to Adult ratio (CES)	10	2000-2010	56	Smoothed trend	51 Index value	100 Index value	96%		
Juvenile to Adult ratio (CES)	5	2005-2010	56	Smoothed trend	70 Index value	100 Index value	43%		

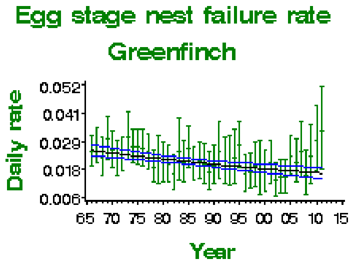
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



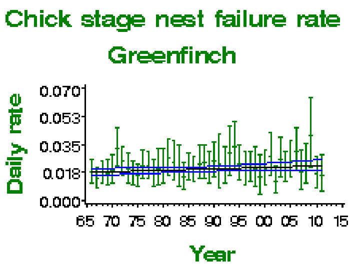
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



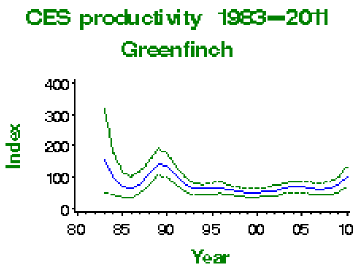
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Smoothed long-term trend in ratio of juvenile:adult birds caught - green lines indicate 85% confidence limits

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Goldfinch

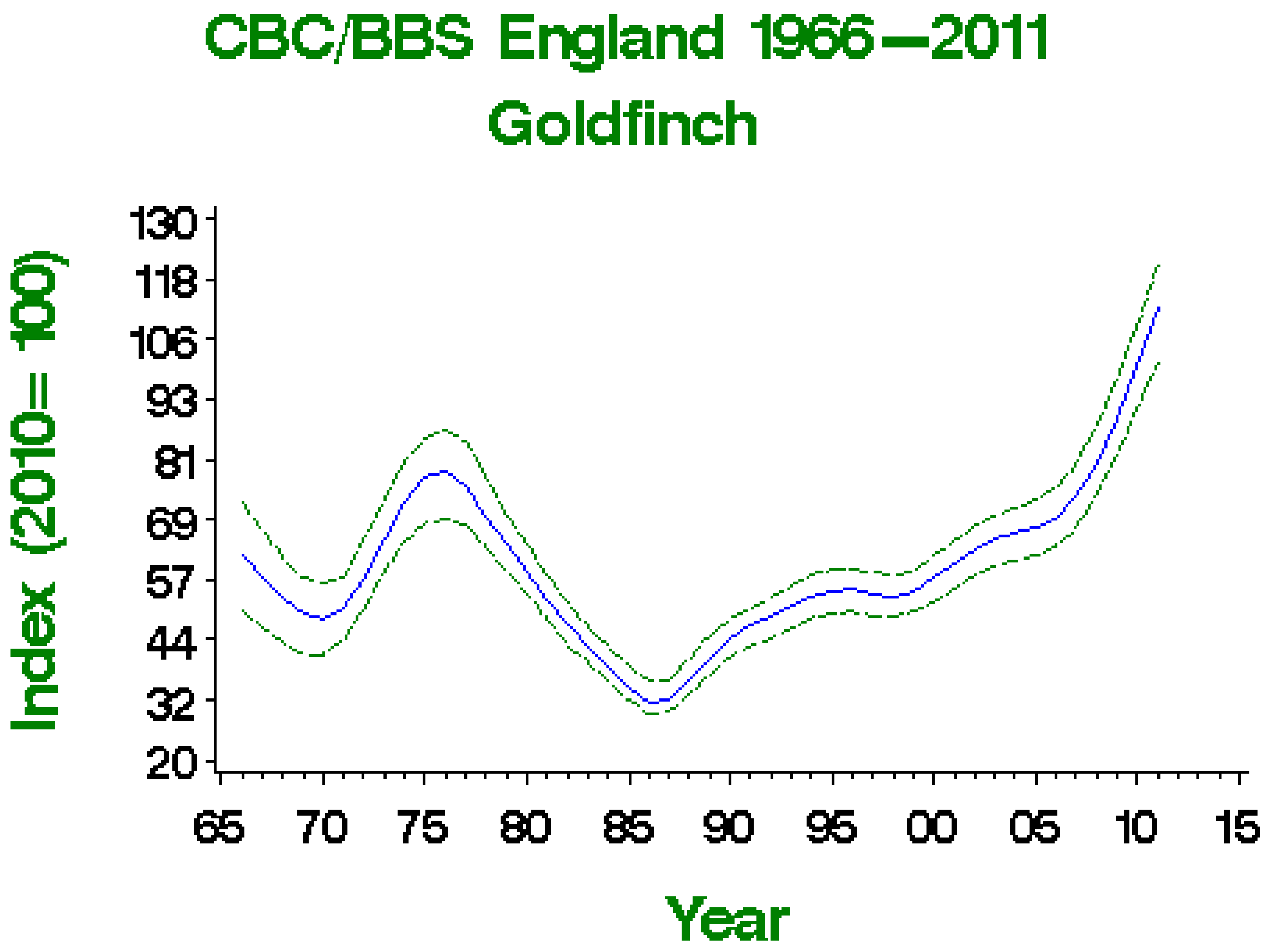
Carduelis carduelis

Key facts

Conservation listings:	Europe: no SPEC category (not concentrated in Europe, conservation status favourable) (BiE04) UK: green (species level); amber (race britannica, >20% of European breeders) (BoCC3)
Long-term trend:	England: moderate increase
Population size:	1.2 (1.1-1.3) million pairs in 2009 (APEP13: distance sampling estimate for 2006 (Newson et al. 2008) updated using BBS trend)

Status summary

Goldfinch abundance fell sharply from the mid 1970s until the mid 1980s, but the decline was both preceded and followed by significant population increases. The BBS Siriwardena et al. 1999). There has been some long-term reduction in productivity as measured by CES, but no change in the number of fledglings per breeding attempt. There has been widespread moderate increase across Europe since 1980, though with little change since 1990 (PECBMS 2012a). A strong increase has been recorded in the Republic of Ireland since 1998 (Crowe et al. 2010).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

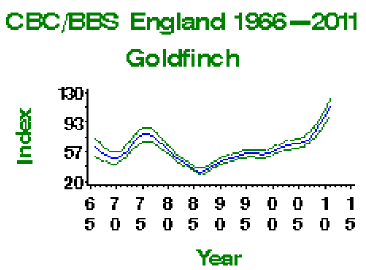
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	43	1967-2010	519	74	38	134		
	25	1985-2010	826	188	135	232		
	10	2000-2010	1457	76	68	88		
	5	2005-2010	1717	49	44	56		
CES adults	26	1984-2010	30	56	-12	171		

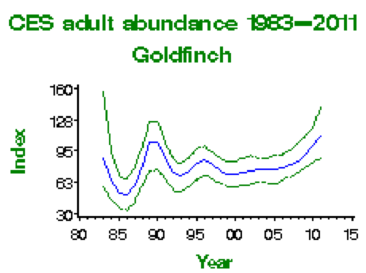
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	25	1985-2010	31	97	17	247		
	10	2000-2010	38	41	6	92		
	5	2005-2010	39	31	4	74		
CES juveniles	26	1984-2010	21	-3	-57	369		
	25	1985-2010	22	61	-27	338		
	10	2000-2010	26	92	16	185		
	5	2005-2010	27	131	41	281		
BBS UK	15	1995-2010	1506	91	80	102		
	10	2000-2010	1744	72	63	80		
	5	2005-2010	2034	42	37	50		
BBS England	15	1995-2010	1241	82	73	95		
	10	2000-2010	1431	75	67	84		
	5	2005-2010	1684	47	43	55		
BBS Scotland	15	1995-2010	85	133	59	208		
	10	2000-2010	98	80	31	127		
	5	2005-2010	112	43	18	76		
BBS Wales	15	1995-2010	125	71	37	119		
	10	2000-2010	144	15	0	30		
	5	2005-2010	153	7	-7	20		
BBS N.Ireland	15	1995-2010	45	773				
	10	2000-2010	61	225				
	5	2005-2010	72	66				

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

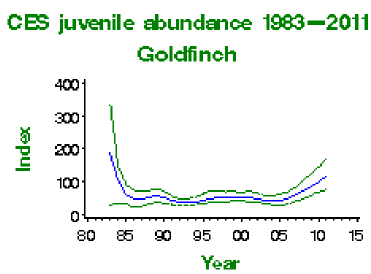
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



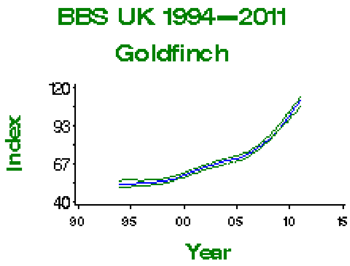
CBC/BBS England graph



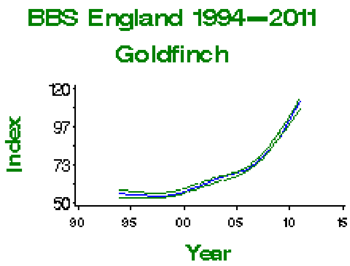
CES adults graph



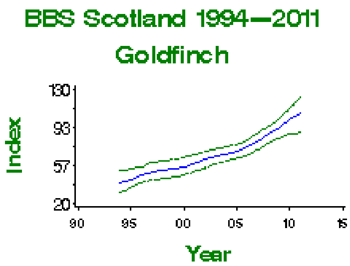
CES juveniles graph



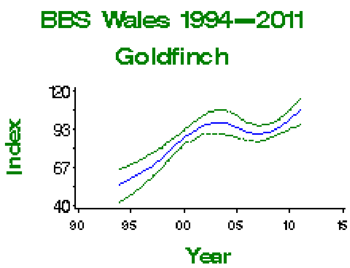
BBS UK graph



BBS England graph



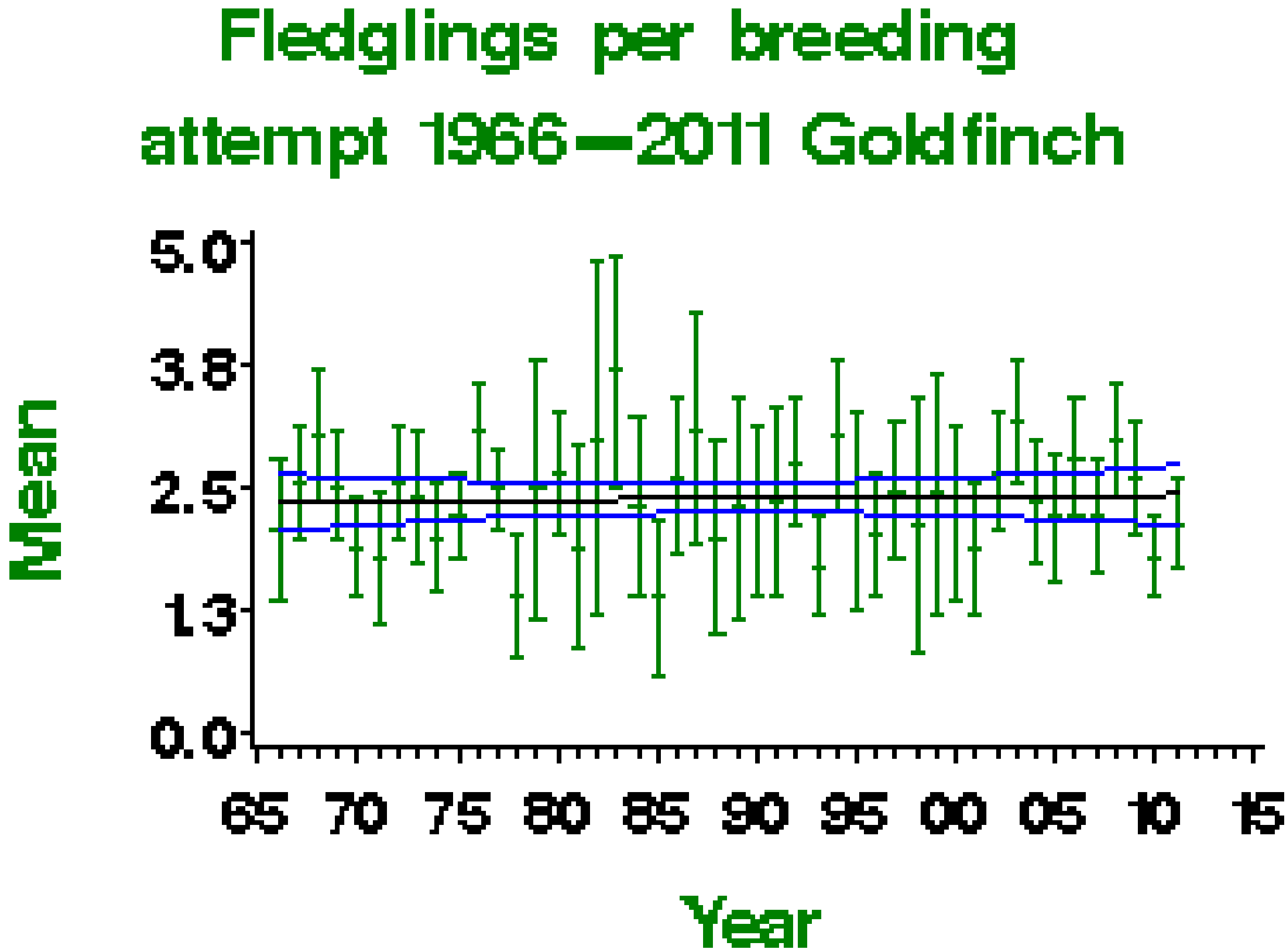
BBS Scotland graph



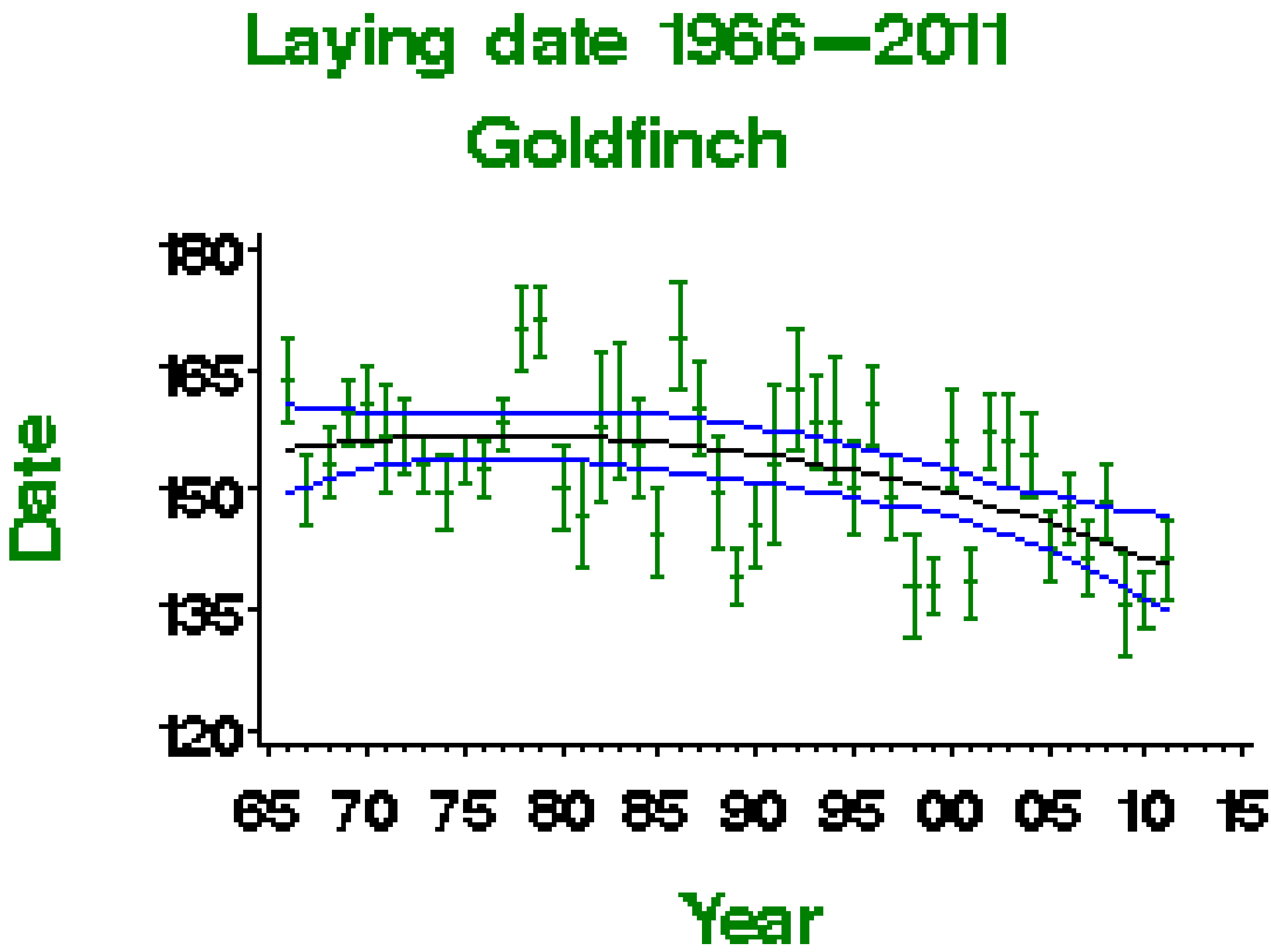
BBS Wales graph

BBS N.Ireland graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

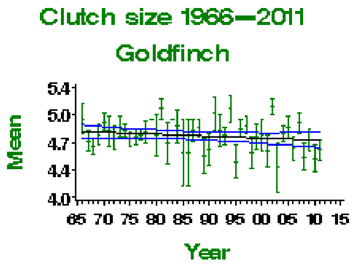


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

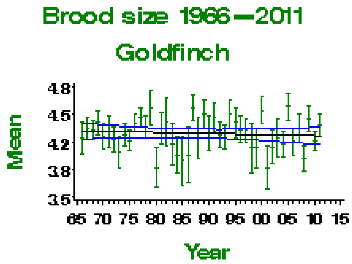
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	28	None					
Clutch size	42	1968-2010	21	None					Small sample
Brood size	42	1968-2010	34	None					
Nest failure rate at egg stage	42	1968-2010	36	None					
Nest failure rate at chick stage	42	1968-2010	29	None					Small sample
Laying date	42	1968-2010	23	Curvilinear	Jun 5	May 22	-14 days		Small sample
Juvenile to Adult ratio (CES)	26	1984-2010	36	Smoothed trend	294 Index value	100 Index value	-66%	>50	
Juvenile to Adult ratio (CES)	25	1985-2010	37	Smoothed trend	468 Index value	100 Index value	-79%	>50	
Juvenile to Adult ratio (CES)	10	2000-2010	44	Smoothed trend	176 Index value	100 Index value	-43%	>25	
Juvenile to Adult ratio (CES)	5	2005-2010	43	Smoothed trend	84 Index value	100 Index value	19%		

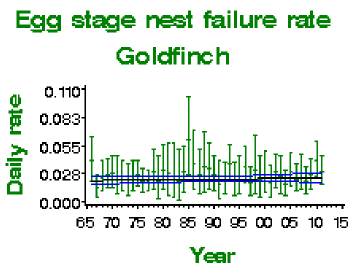
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



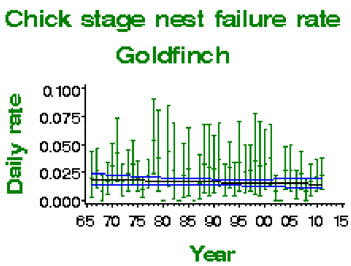
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



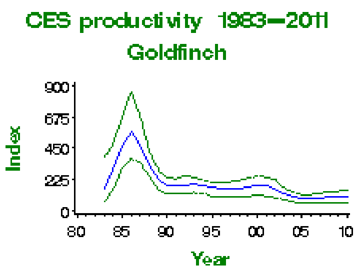
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Smoothed long-term trend in ratio of juvenile:adult birds caught - green lines indicate 85% confidence limits

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Siskin

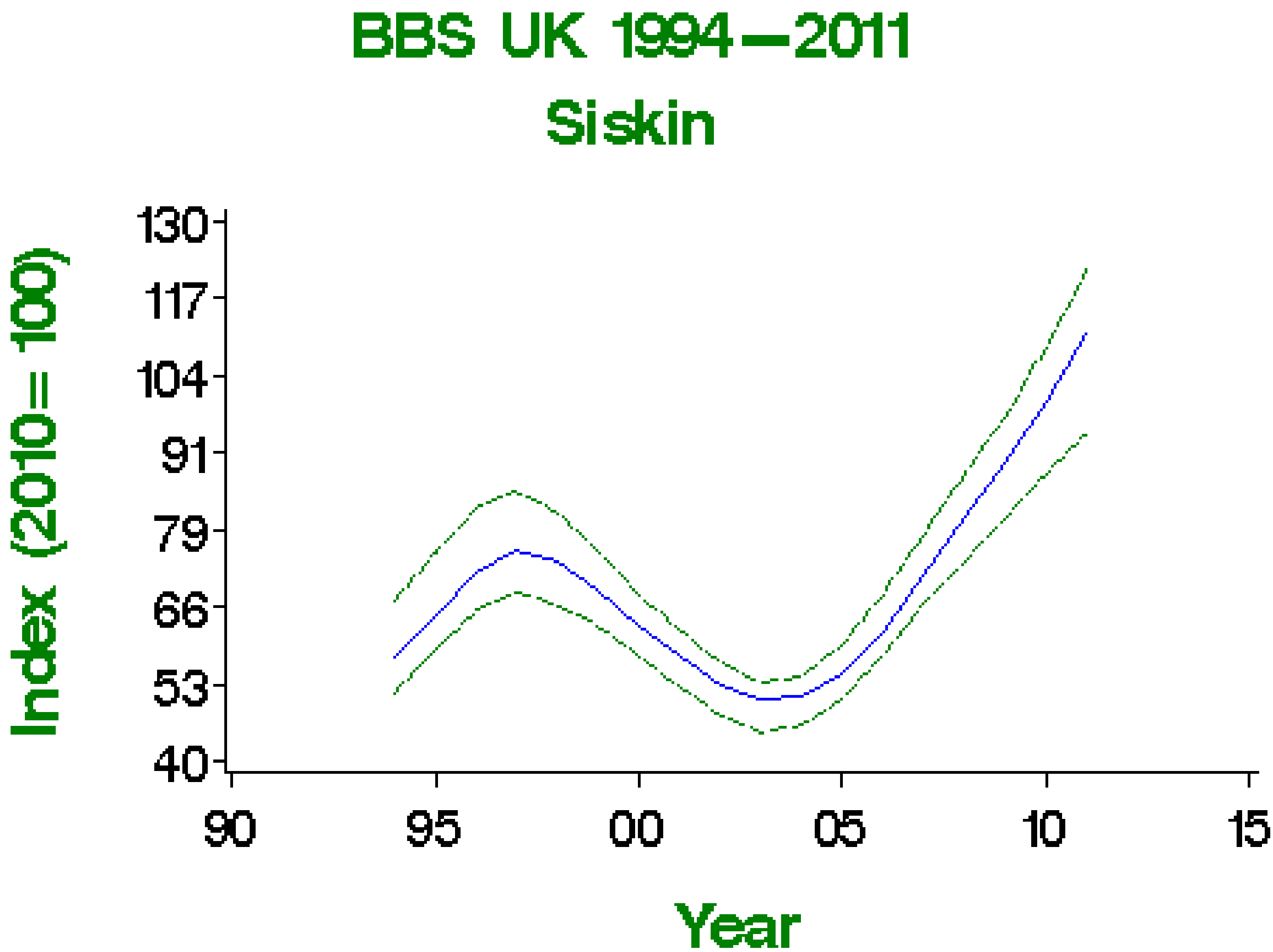
Spinus spinus

Key facts

Conservation listings:	Europe: no SPEC category (concentrated in Europe, conservation status favourable) (BiE04) UK: green (BoCC3)
Long-term trend:	UK: increase
Population size:	420,000 pairs in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Status summary

The maturing of new conifer plantations has aided the spread of breeding Siskins throughout the UK, from their previous stronghold in the Scottish Highlands, since about 1950. Its habit of using garden feeders, especially in late winter, has developed since the 1960s and, despite many of the birds involved migrating to the Baltic region to breed, may also have helped to boost the UK breeding population. The 1988-91 Breeding Atlas identified a considerable expansion of the breeding range into southern Britain (Gibbons et al. 1993). More CBC plots became occupied during the 1970s and 1980s, but samples were still insufficient for annual monitoring until BBS began in 1994. Results since then show extraordinary fluctuations, in both England and Scotland, which have been largely in parallel. To some extent, this may reflect the occasional large continental influxes affecting numbers on a broad UK scale. The overall trend across Europe since 1980 has been a moderate decrease (PECBMS 2012a).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

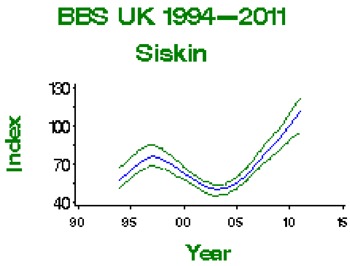
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	15	1995-2010	162	55	16	86		
	10	2000-2010	184	60	29	91		
	5	2005-2010	232	83	55	110		

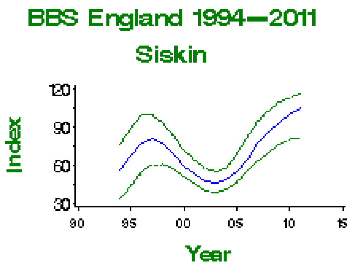
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS England	15	1995-2010	57	50	-13	157		
	10	2000-2010	68	69	12	122		
	5	2005-2010	90	83	38	98		
BBS Scotland	15	1995-2010	73	52	10	98		
	10	2000-2010	80	47	11	96		
	5	2005-2010	100	79	46	127		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

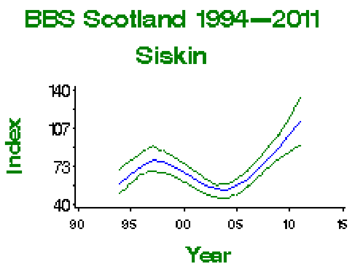
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



BBS UK graph



BBS England graph



BBS Scotland graph

Demographic trends

Productivity and survival trends for this species are not currently produced by BTO

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Linnet

Linaria cannabina

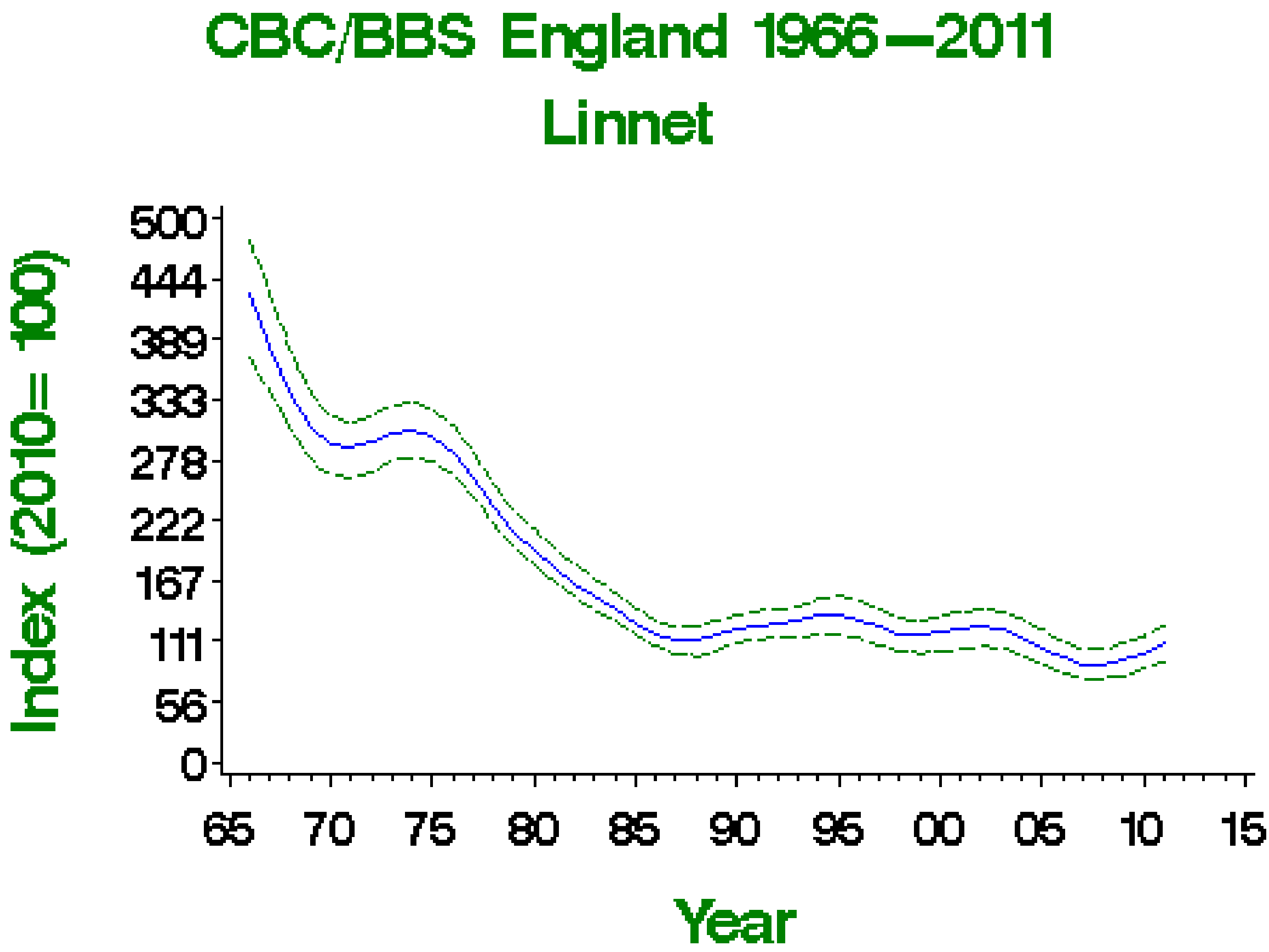
Key facts

Conservation listings:	Europe: SPEC category 2 (declining) (BiE04) UK: red (species level, race cannabina); amber (race autochthona, >20% of European breeders, European status) (BoCC3) UK Biodiversity Action Plan: click here, priority species
Long-term trend:	England: rapid decline
Population size:	430,000 territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend for England)

Migrant status:	Short-distance migrant
Nesting habitat:	Above-ground nester
Primary breeding habitat:	Farmland
Secondary breeding habitat:	
Breeding diet:	Vegetation
Winter diet:	Vegetation

Status summary

Linnet abundance fell rapidly in the UK between the mid 1970s and mid 1980s. Numbers have subsequently changed little overall, although with further decreases in England and Wales and possibly some increase in Northern Ireland. The BBS PECBMS 2012a), and the European status of this species is no longer considered 'secure' (BirdLife International 2004).



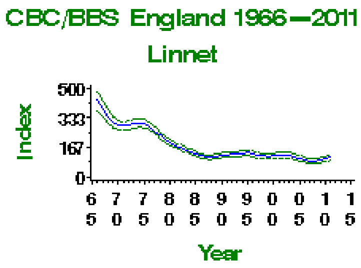
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

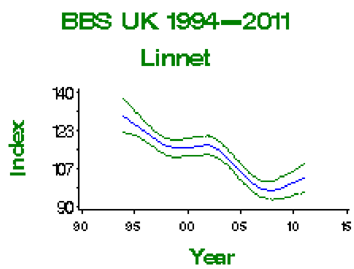
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	43	1967-2010	433	-74	-80	-66	>50	
	25	1985-2010	655	-22	-38	-6		
	10	2000-2010	1005	-16	-21	-9		
	5	2005-2010	1062	-5	-12	1		
BBS UK	15	1995-2010	1168	-21	-28	-14		
	10	2000-2010	1227	-14	-20	-6		
	5	2005-2010	1292	-5	-12	2		
BBS England	15	1995-2010	943	-27	-33	-22	>25	
	10	2000-2010	982	-16	-22	-11		
	5	2005-2010	1033	-5	-12	-1		
BBS Scotland	15	1995-2010	90	8	-22	34		
	10	2000-2010	94	4	-22	39		
	5	2005-2010	101	5	-20	27		
BBS Wales	15	1995-2010	92	-30	-48	-9	>25	
	10	2000-2010	101	-40	-57	-26	>25	
	5	2005-2010	101	-27	-43	-16	>25	
BBS N.Ireland	15	1995-2010	36	60	10	139		
	10	2000-2010	42	13	-12	73		
	5	2005-2010	48	1	-18	42		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

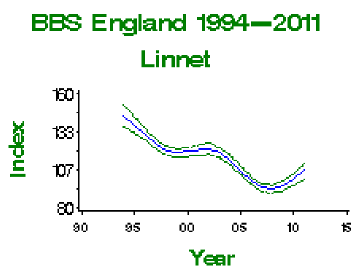
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



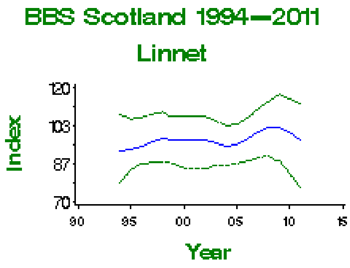
CBC/BBS England graph



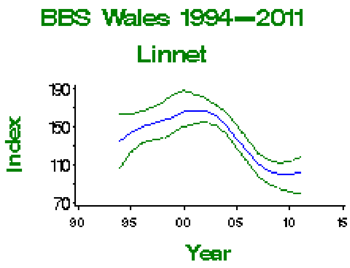
BBS UK graph



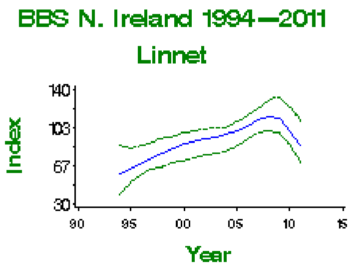
BBS England graph



BBS Scotland graph

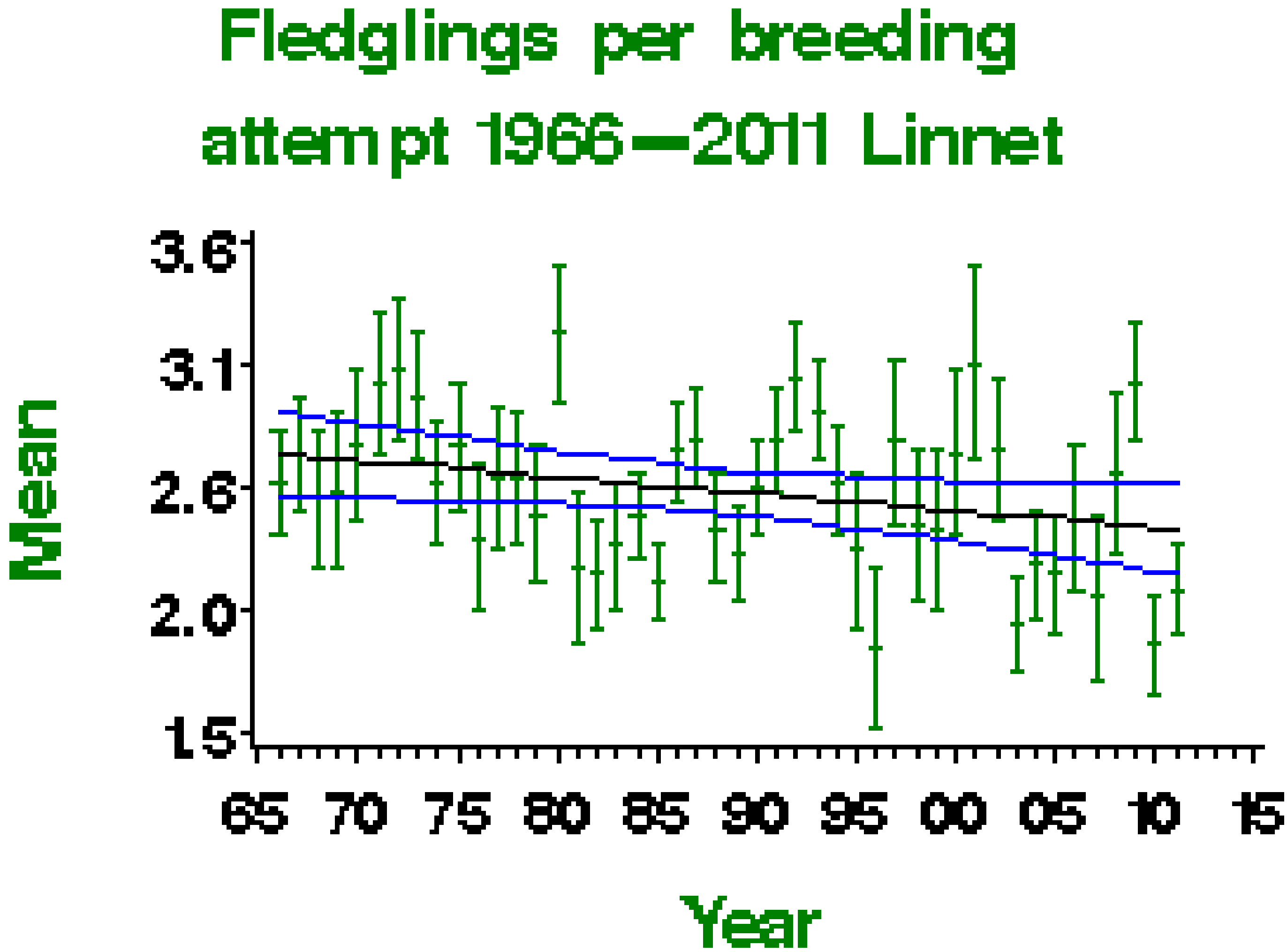


BBS Wales graph

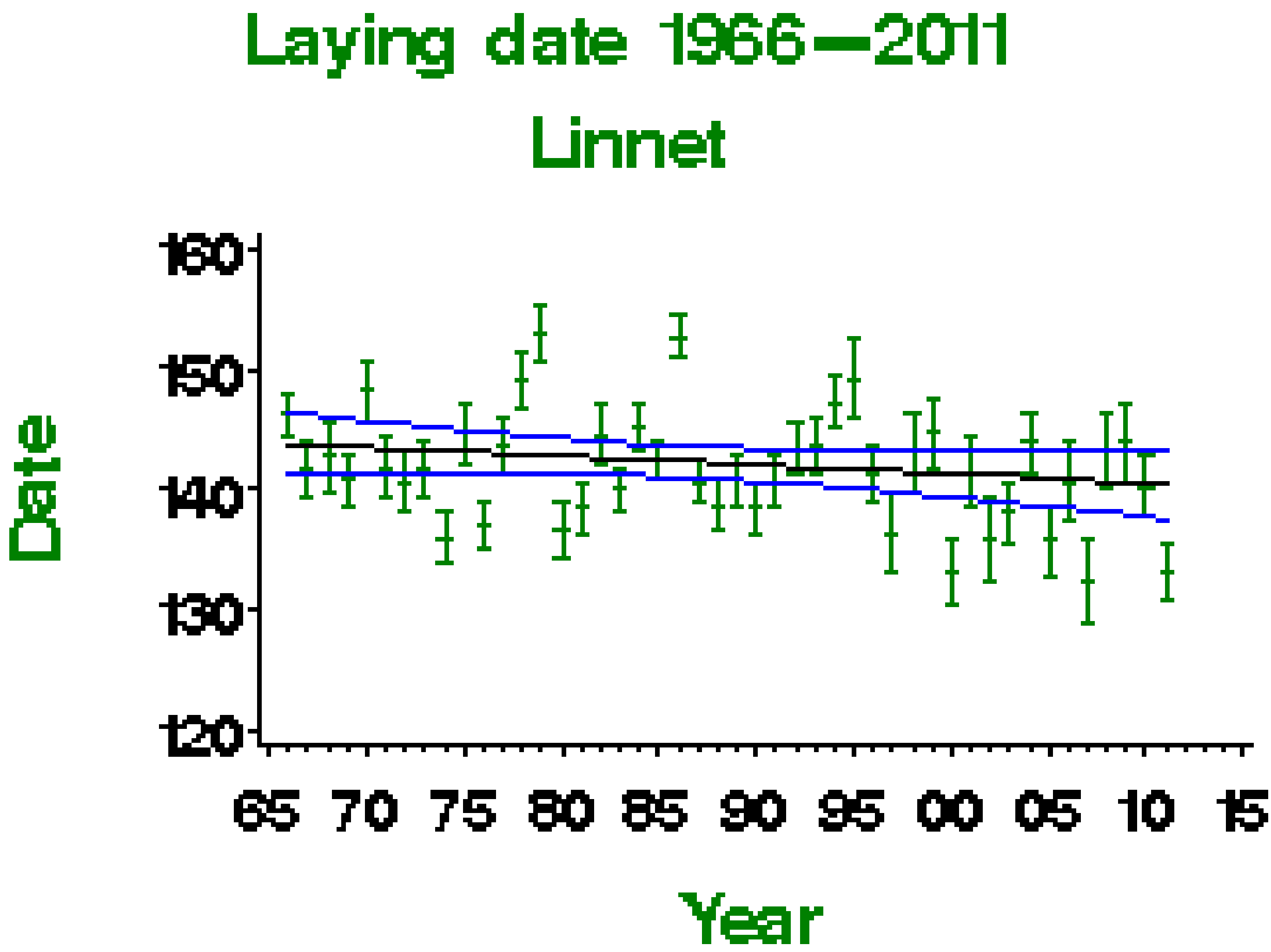


BBS N.Ireland graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

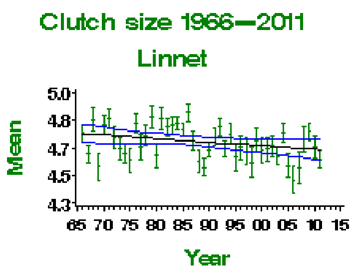


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

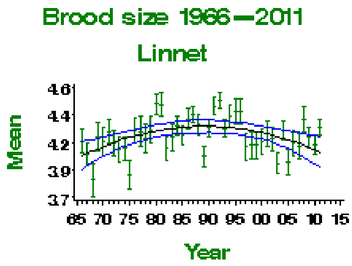
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	108	None					
Clutch size	42	1968-2010	108	None					
Brood size	42	1968-2010	124	Curvilinear	4.08 chicks	4.09 chicks	0.3%		
Nest failure rate at egg stage	42	1968-2010	150	Linear increase	1.84% nests/day	2.29% nests/day	24.5%		
Nest failure rate at chick stage	42	1968-2010	108	Linear increase	1.57% nests/day	2.23% nests/day	42.0%		
Laying date	42	1968-2010	108	None			0 days		

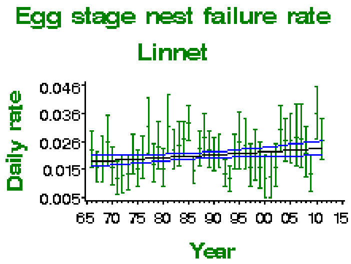
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



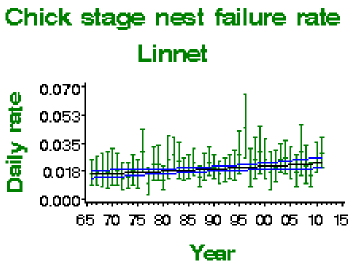
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

Causes of change

There is convincing evidence that nest failure rates at the egg stage rose during the principal period of population decline and this represents the most likely demographic mechanism driving the observed decreases in abundance. The most likely ecological driver of this pattern is habitat impoverishment due to agricultural intensification.

Change factor	Primary driver	Secondary driver
Demographic	Decreased breeding success	
Ecological	Agricultural intensification	

Further information on causes of change

Siriwardena et al. (1999, 2000b) provide convincing evidence that nest failure rates at the egg stage rose during the principal period of population decline and this represents the most likely demographic mechanism driving the observed decrease in abundance. They found an obvious change in the egg-stage failure rate of Linnet nests after 1975 and this was detectable in the total fledglings produced, suggesting that the deterioration in breeding performance had an important role in driving the species' concurrent decline in abundance (Siriwardena et al. 2000b). Nest failure rates increased between 1968 and 2008. The number of fledglings per breeding attempt shows a linear decrease and recent decreases in clutch and brood sizes are reported (see above). Moorcroft & Wilson (2000) concur that the severe decline during the 1970s and 1980s occurred via a reduction in breeding success, attributing this to a reduction in the availability of breeding-season food supplies on arable farmland caused by agricultural intensification. However, they state that the precise demographic mechanism involved is unclear: instead of breeding performance per attempt, they suggest reductions in the number of nesting attempts being made by individual females or a reduction in immediate post-fledging survival due to resource limitations as the most likely, although these hypotheses were not tested. BTO monitoring data do not permit analysis of influences on these parameters, so it is plausible that such effects occurred in parallel with the breeding success effects indicated by NRS results. Nevertheless, all these patterns are consistent with the results of Siriwardena et al. (1999), who reported that index change was not significantly correlated with correlations with adult and first-year survival. They found no significant trend-specific difference in survival, and survival rates in periods of decline were higher than those in periods of increase.

Since 1986, egg-stage nest survival has increased and this has led to a slight increase in breeding performance, although, as with the earlier decline, greater numbers of breeding attempts or increased post-fledging survival may also have contributed to the population increase (Siriwardena et al. 2000b, Wilson et al. 1996, Moorcroft et al. 1997). Increases in the crop area of oilseed rape are thought to have improved Linnet breeding success by compensating for the herbicide-mediated decline in many farmland weeds that were traditionally important in this species' summer diet (Moorcroft et al. 1997). Both the number of breeding attempts possible in a season and post-fledging survival could have increased in response to this improvement in food supplies, as could chick survival. Oddly, Siriwardena et al. (2001b) identified a significant negative effect of rape on breeding performance through the egg-stage daily nest failure rate and no positive effect on success through the nestling stage in a further analysis of nest record data. This is clearly inconsistent with the results of intensive work on Linnets (Wilson et al. 1996, Moorcroft et al. 1997), perhaps reflecting the different geographical biases affecting nest records and this particular intensive study. Nevertheless, it suggests that environmental effects on Linnet breeding success show complex spatial variation and that the knock-on effects on trends in abundance could also be difficult to characterise.

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Lesser Redpoll

Acanthis cabaret

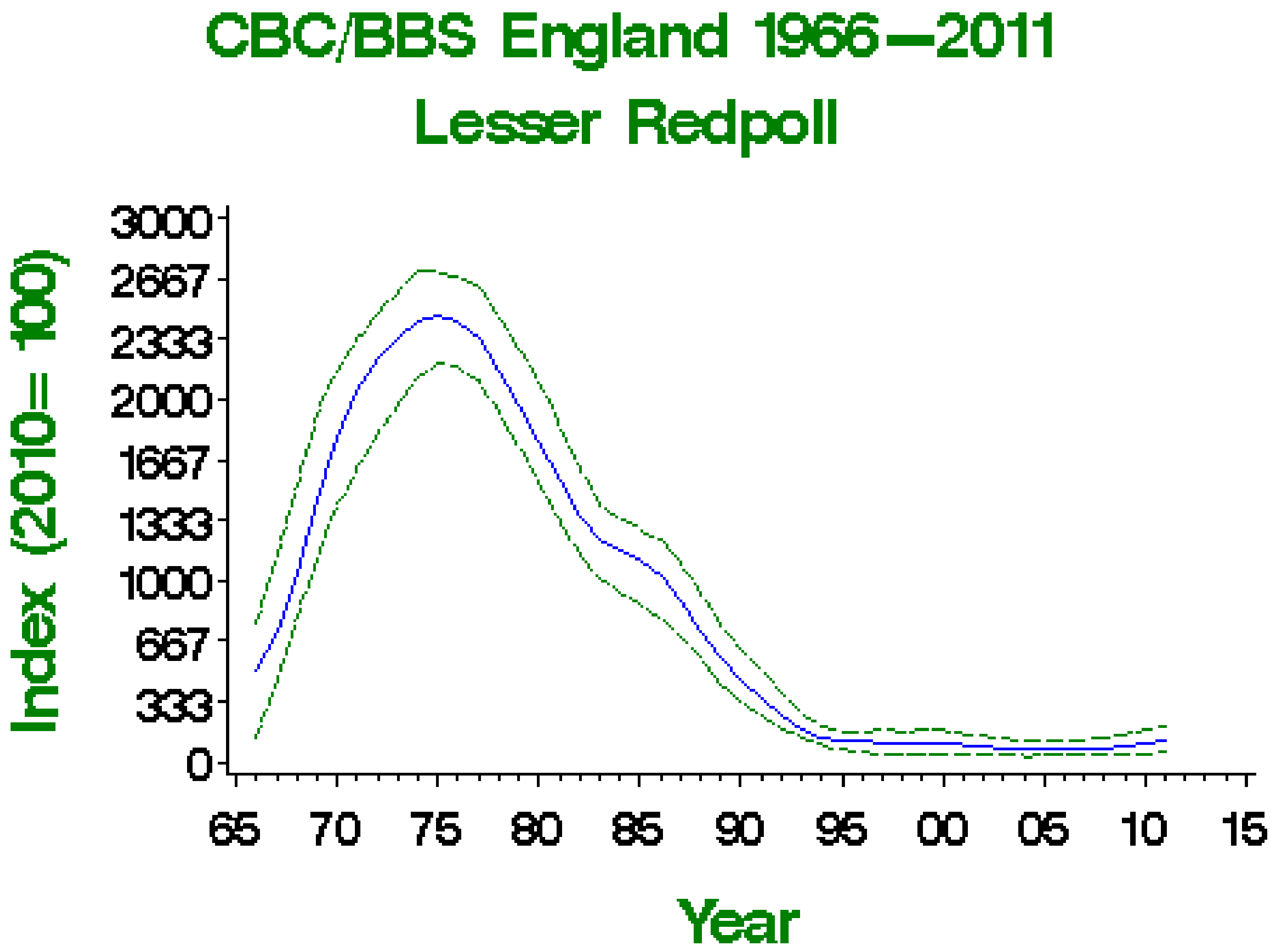
Key facts

Conservation listings:	Europe (C. cabaret/flammea): no SPEC category (not concentrated in Europe, conservation status favourable) (BiE04) UK: red (>50% population decline) (BoCC3) UK Biodiversity Action Plan: priority species
Long-term trend:	England: rapid decline
Population size:	220,000 pairs in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Migrant status:	Short-distance migrant
Nesting habitat:	Above-ground nester
Primary breeding habitat:	Woodland
Secondary breeding habitat:	
Breeding diet:	Animal
Winter diet:	Vegetation

Status summary

Lesser Redpolls were abundant and widespread in lowland Britain in the 1970s, and frequent on CBC and CES plots, but are largely absent now as breeding birds after a sustained period of severe decline. Uncertainty about the representativeness of the monitoring data prior to the establishment of BBS initially denied the species a place on the red list, since it was thought possible that the population may have withdrawn from the lowlands to northern and western UK regions, where monitoring prior to 1994 was less effective. No evidence for such a shift exists, however: the species was moved from green to amber in 2002 and now to red. The 1988-91 Atlas showed a range contraction of 11% since 1968-72, which is evident in all parts of the UK (Gibbons et al. 1993). Since C. cabaret is now widely treated as a separate species from the Common Redpoll C. flammea, and has a restricted range that lies wholly within western Europe, it is likely to gain a European conservation listing at the next review. A strong increase has been recorded in the Republic of Ireland since 1998, however (Crowe et al. 2010). Recent UK data show wide variation between years, but no clear trend.



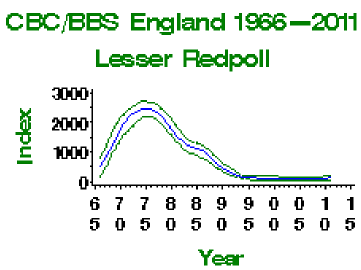
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

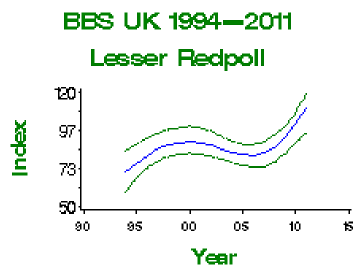
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	43	1967-2010	47	-86	-95	-64	>50	
	25	1985-2010	46	-91	-96	-82	>50	Small CBC sample
	10	2000-2010	68	4	-43	65		
	5	2005-2010	78	34	-2	77		
BBS UK	15	1995-2010	156	32	2	58		
	10	2000-2010	172	12	-12	31		
	5	2005-2010	201	23	7	37		
BBS England	15	1995-2010	61	-10	-44	33		
	10	2000-2010	68	4	-41	60		
	5	2005-2010	78	35	4	77		
BBS Scotland	15	1995-2010	46	26	-10	81		
	10	2000-2010	49	-1	-29	39		
	5	2005-2010	60	27	-1	60		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

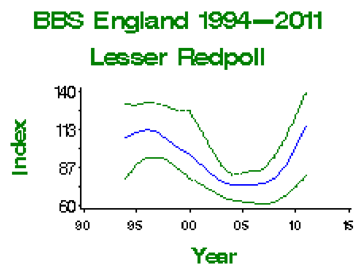
BTO JNCC rspb The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



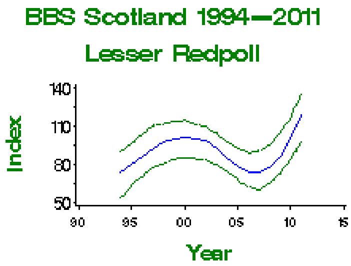
CBC/BBS England graph



BBS UK graph



BBS England graph



BBS Scotland graph

Demographic trends

Productivity and survival trends for this species are not currently produced by BTO

Causes of change

Although sample sizes are small, declines in both survival and productivity appear to have led to the Lesser Redpoll decline. Evidence for the ecological drivers behind this is largely circumstantial but they are thought to include maturation of woodland and a reduction in birch seed food supplies.

Change factor	Primary driver	Secondary driver
Demographic	Decreased survival	Decreased breeding success
Ecological	Changes in woodland	

Further information on causes of change

Though samples are too small to continue presenting a trend, CES data indicated a rapid long-term decline in productivity and there is evidence that survival rates have fallen (Siriwardena et al. 1998).

There is very little evidence available regarding the ecological drivers behind the decline of this species. In southern Britain, at least, the decrease may be attributable to a reduction in the amount of suitable young forest growth (Fuller et al. 2005). Amar et al. (2006) and Smart et al. (2007) both found relationships with lichen and bracken cover, although these studies were limited to broadleaved woodlands. Evans (1966) and Cramp & Perrins (1994) point to the importance of birch to the species, which could potentially explain the relationships found by Amar et al. (2006) and Smart et al. (2007). Birch seeds are an important component of this species' diet. Amaret al. (2006) state that birch has declined in many woodlands as they have matured, and this could raise the possibility of winter food as a factor in the species decline, although this evidence is circumstantial and given that species with similar winter diet, such as Siskin, are faring better, may be unlikely.

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Common Crossbill

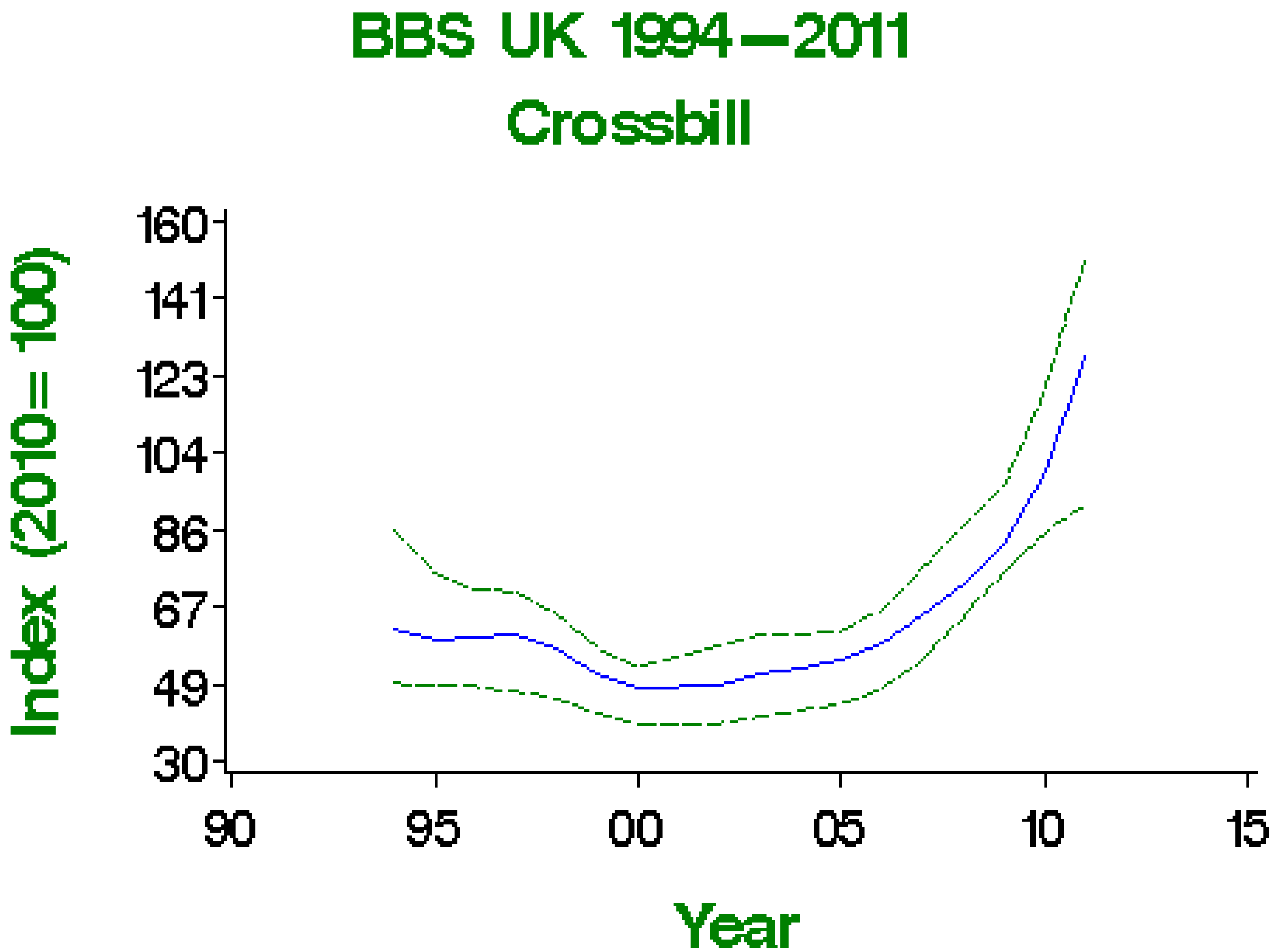
Loxia curvirostra

Key facts

Conservation listings:	Europe: no SPEC category (not concentrated in Europe, conservation status favourable) (BiE04) UK: green (BoCC3)
Long-term trend:	UK: fluctuating, with no long-term trend
Population size:	40,000 (31,000-53,000) pairs in 2009 (APEP13: distance sampling estimate for 2006 (Newson et al. 2008) updated using BBS trend)

Status summary

The UK breeding population of Crossbills is difficult to assess in any one season, except by special survey, and is exceptionally variable between years. The core of the population lies in the taiga forests across Eurasia, from where birds periodically erupt westwards and southwards in search of better feeding conditions. After arrivals in Britain, many thousands of birds may stay to breed, perhaps for a few years, before survivors and their offspring return to the Continent (Newton 2006). The spur to movements is a failure of the cone crop, especially in Norway spruce Picea abies, which is this species' main food (Summers 1999). Crossbills begin breeding in January, sometimes even earlier, and by the start of the BBS period in April most sightings are of highly mobile family parties. In irruption years, BBS sightings may include many birds from the Continent, which often begin to arrive in late May or during June. The BBS trend therefore reflects post-breeding rather than breeding numbers, and on a wider geographical scale than just the UK.



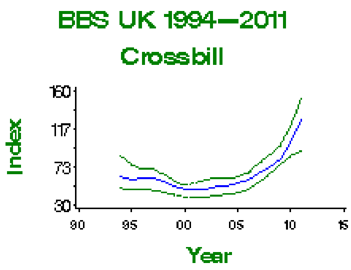
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	15	1995-2010	54	68	12	142		
	10	2000-2010	62	111	65	202		
	5	2005-2010	76	83	41	161		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



BBS UK graph

Demographic trends

Productivity and survival trends for this species are not currently produced by BTO

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Bullfinch

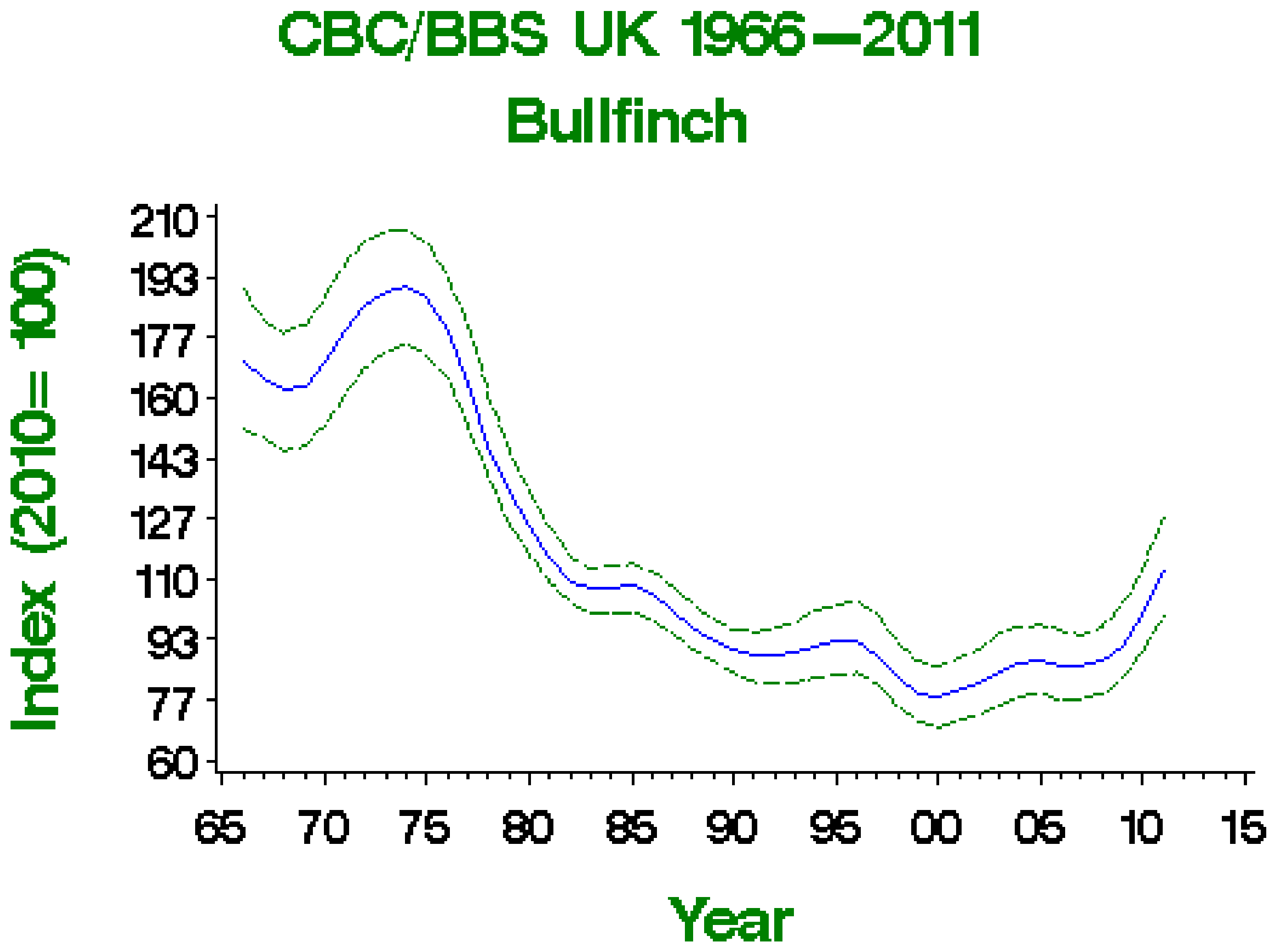
Pyrrhula pyrrhula

Key facts

Conservation listings:	Europe: no SPEC category (not concentrated in Europe, conservation status favourable) (BiE04) UK: amber (25-50% population decline) (BoCC3) UK Biodiversity Action Plan: click here, priority species
Long-term trend:	UK, England: moderate decline
Population size:	220,000 territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Status summary

The UK Bullfinch population entered a long period of decline in the mid 1970s, following a period of relative stability. The decline was initially very steep, and more so in farmland than in wooded habitats, but has been shallower since the early 1980s. CES and CBC/BBS both suggest there are large fluctuations around the overall downward trend. The BBS Siriwardena et al. 1999, 2000b, 2001), although agricultural intensification and a reduction in the structural and floristic diversity of woodland are suspected to have played a part through losses of food resources and nesting cover (Fuller et al. 2005). Alongside these factors, Proffittet al. (2004) and Marquiss (2007) mention the constraints on survival outside the breeding season and the possible role of higher Leech & Barimore 2008), and the trend in fledglings per breeding attempt is downward. Numbers have shown widespread moderate decrease across Europe since 1980 (PECBMS 2012a). The UK conservation listing was downgraded from red to amber in 2009, but the scale of decline still places the species near the borderline between these categories.



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	316	-39	-51	-22	>25	
	25	1985-2010	435	-7	-20	9		
	10	2000-2010	647	29	21	41		

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	43	1967-2010	255	-43	-56	-28	>25	
	25	1985-2010	343	-14	-28	-1		
	10	2000-2010	498	23	13	36		
	5	2005-2010	559	14	6	22		
CES adults	26	1984-2010	80	-9	-31	19		
	25	1985-2010	82	-10	-33	15		
	10	2000-2010	85	20	-5	47		
	5	2005-2010	82	5	-10	21		
CES juveniles	26	1984-2010	65	-12	-43	41		
	25	1985-2010	66	-5	-35	41		
	10	2000-2010	69	11	-22	47		
	5	2005-2010	68	20	-9	50		
BBS UK	15	1995-2010	577	6	-1	15		
	10	2000-2010	639	28	21	38		
	5	2005-2010	726	16	11	24		
BBS England	15	1995-2010	442	2	-6	12		
	10	2000-2010	485	20	12	32		
	5	2005-2010	549	14	7	22		
BBS Scotland	15	1995-2010	39	42	0	81		
	10	2000-2010	43	37	11	75		
	5	2005-2010	52	41	17	83		
BBS Wales	15	1995-2010	62	-8	-27	14		
	10	2000-2010	70	16	-3	41		
	5	2005-2010	72	-7	-22	12		
BBS N.Ireland	15	1995-2010	30	32	-19	47		
	10	2000-2010	34	67	20	111		
	5	2005-2010	41	27	0	49		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

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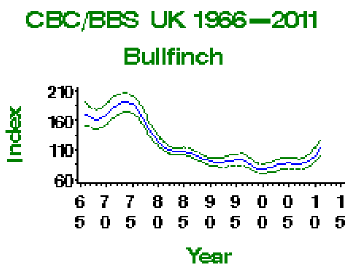
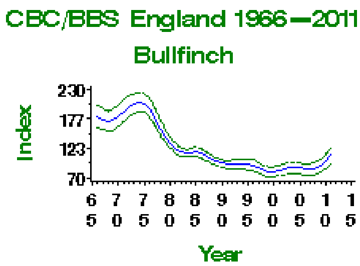
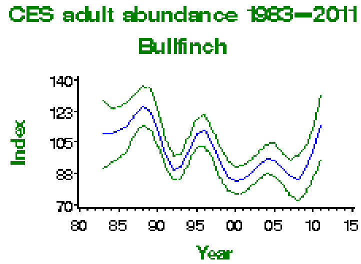


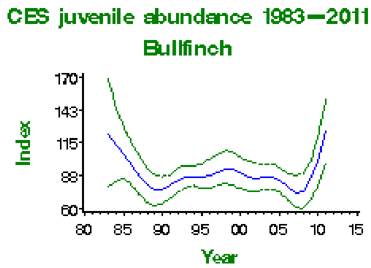
CBC/BBS UK graph



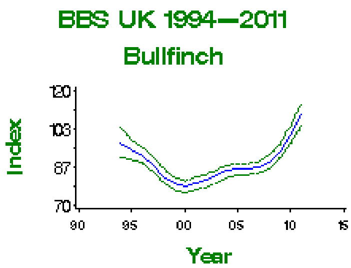
CBC/BBS England graph



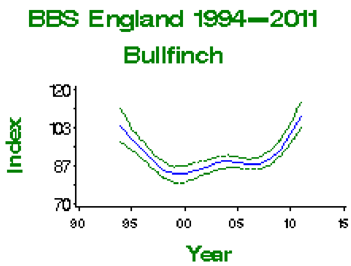
CES adults graph



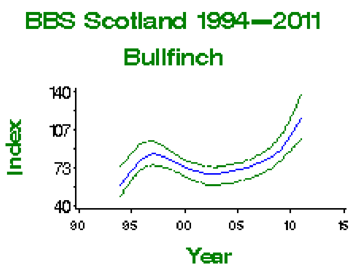
CES juveniles graph



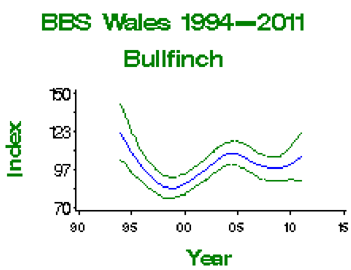
BBS UK graph



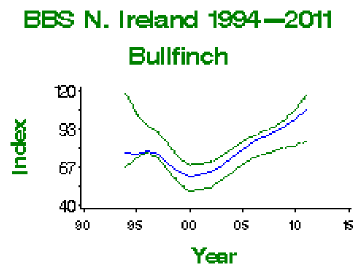
BBS England graph



BBS Scotland graph

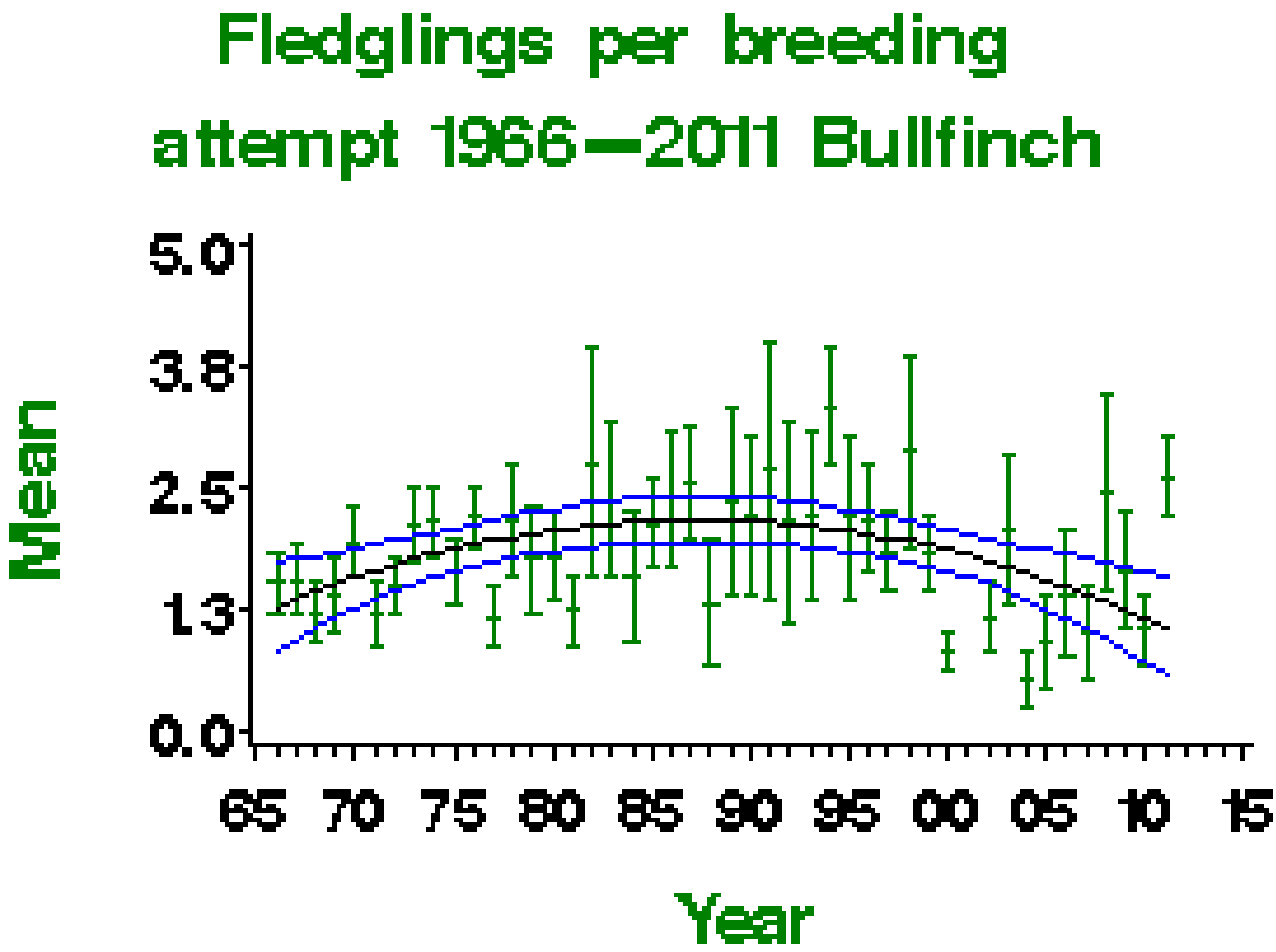


BBS Wales graph

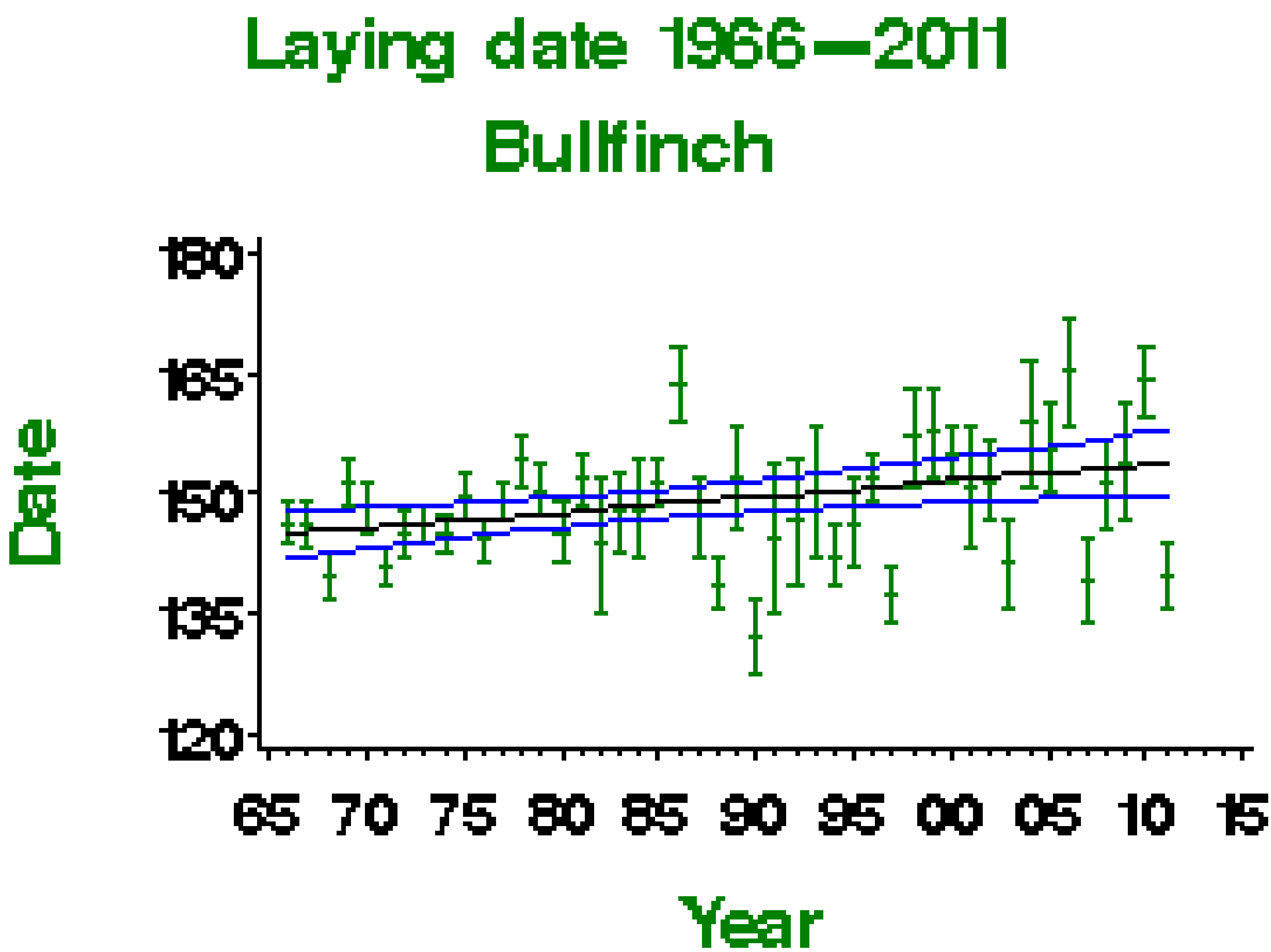


BBS N.Ireland graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

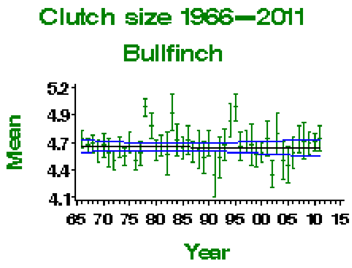


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

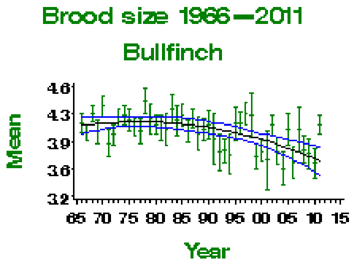
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	33	Curvilinear	1.44 fledglings	1.18 fledglings	-17.9%		
Clutch size	42	1968-2010	36	None					
Brood size	42	1968-2010	37	Curvilinear	4.12 chicks	3.68 chicks	-10.6%		
Nest failure rate at egg stage	42	1968-2010	51	Curvilinear	3.24% nests/day	3.64% nests/day	12.3%		
Nest failure rate at chick stage	42	1968-2010	34	Curvilinear	3.23% nests/day	4.90% nests/day	51.7%		
Laying date	42	1968-2010	34	Linear increase	May 25	Jun 3	9 days		
Juvenile to Adult ratio (CES)	26	1984-2010	85	Smoothed trend	86 Index value	100 Index value	16%		
Juvenile to Adult ratio (CES)	25	1985-2010	87	Smoothed trend	89 Index value	100 Index value	12%		
Juvenile to Adult ratio (CES)	10	2000-2010	89	Smoothed trend	88 Index value	100 Index value	14%		
Juvenile to Adult ratio (CES)	5	2005-2010	86	Smoothed trend	86 Index value	100 Index value	17%		

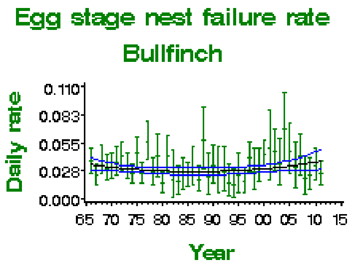
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



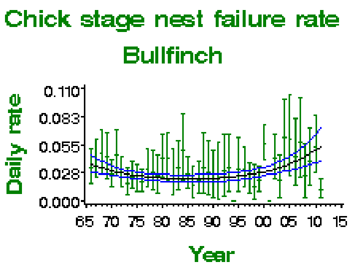
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



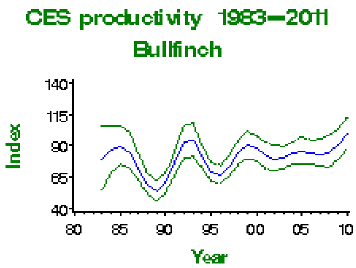
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



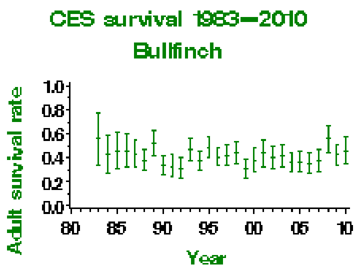
Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Smoothed long-term trend in ratio of juvenile:adult birds caught - green lines indicate 85% confidence limits



Proportion of adult birds surviving to following year - green bars represent 95% confidence limits

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Yellowhammer

Emberiza citrinella

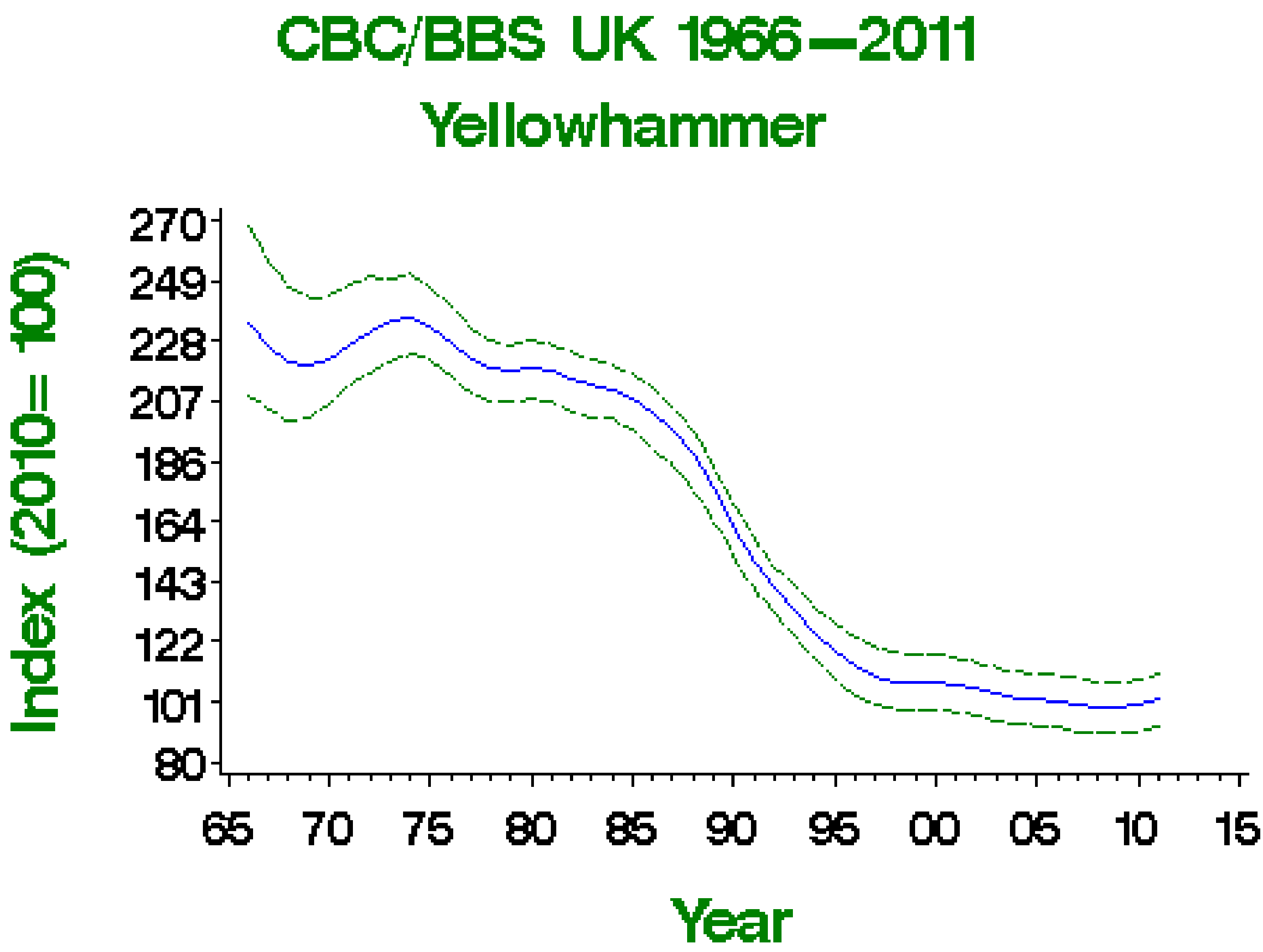
Key facts

Conservation listings:	Europe: no SPEC category (concentrated in Europe, conservation status favourable) (BiE04) UK: red (>50% population decline) (BoCC3) UK Biodiversity Action Plan: priority species
Long-term trend:	UK, England: rapid decline
Population size:	710,000 territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Migrant status:	Resident
Nesting habitat:	Ground nester
Primary breeding habitat:	Farmland
Secondary breeding habitat:	
Breeding diet:	Animal
Winter diet:	Vegetation

Status summary

Yellowhammer abundance began to decline on farmland in the mid 1980s and the downward trend has continued ever since, although BBS indicates that numbers have increased in Scotland since 1994. The BBS PECBMS 2012a).



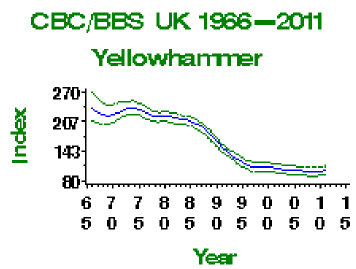
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

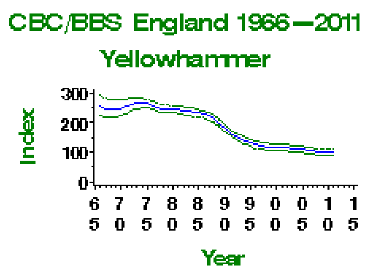
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	532	-56	-64	-46	>50	
	25	1985-2010	807	-52	-58	-46	>50	
	10	2000-2010	1245	-7	-12	-2		
	5	2005-2010	1372	-2	-7	3		
CBC/BBS England	43	1967-2010	464	-60	-68	-49	>50	
	25	1985-2010	704	-57	-63	-51	>50	
	10	2000-2010	1086	-15	-19	-11		
	5	2005-2010	1194	-8	-11	-5		
BBS UK	15	1995-2010	1166	-15	-21	-9		
	10	2000-2010	1227	-6	-11	0		
	5	2005-2010	1353	-1	-5	3		
BBS England	15	1995-2010	1017	-23	-27	-19		
	10	2000-2010	1073	-15	-19	-11		
	5	2005-2010	1184	-8	-11	-5		
BBS Scotland	15	1995-2010	103	26	-2	47		
	10	2000-2010	108	32	12	53		
	5	2005-2010	122	26	10	41		
BBS Wales	15	1995-2010	36	-40	-56	-21	>25	
	10	2000-2010	36	-19	-37	-4		
	5	2005-2010	35	-11	-25	7		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

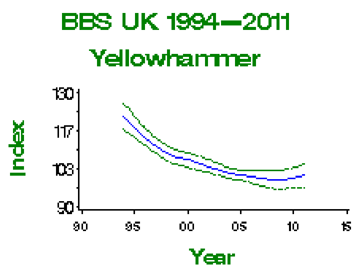
BTO JNCC rspb The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



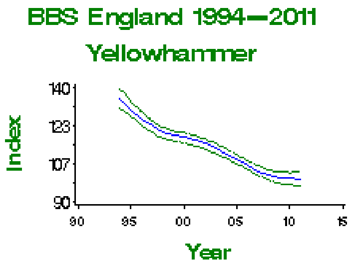
CBC/BBS UK graph



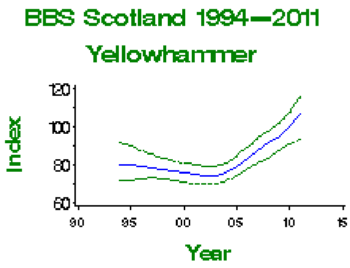
CBC/BBS England graph



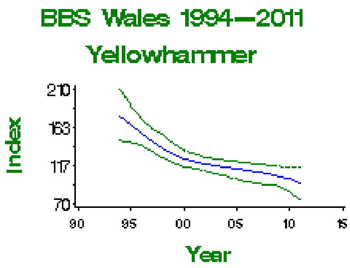
BBS UK graph



BBS England graph

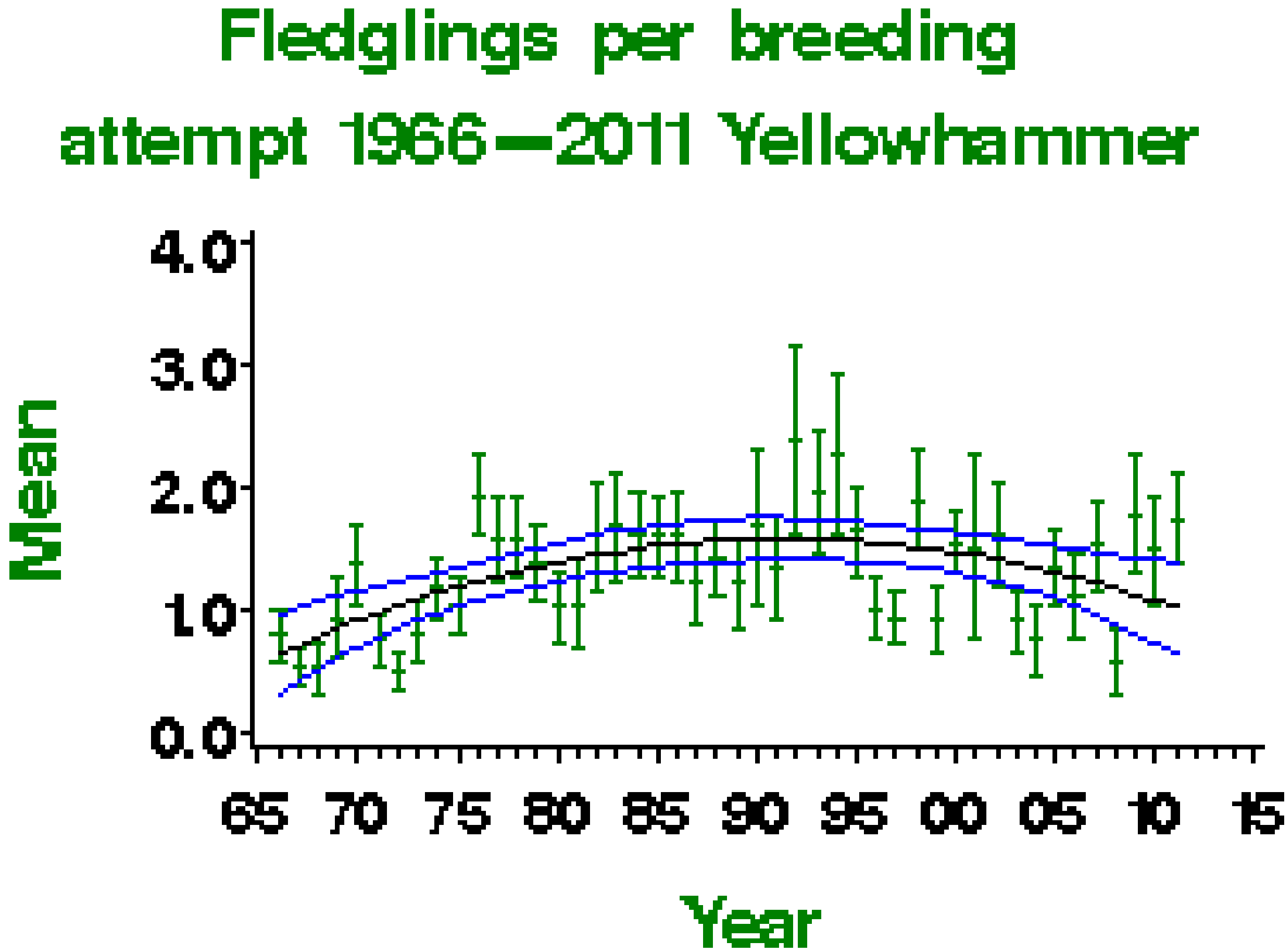


BBS Scotland graph

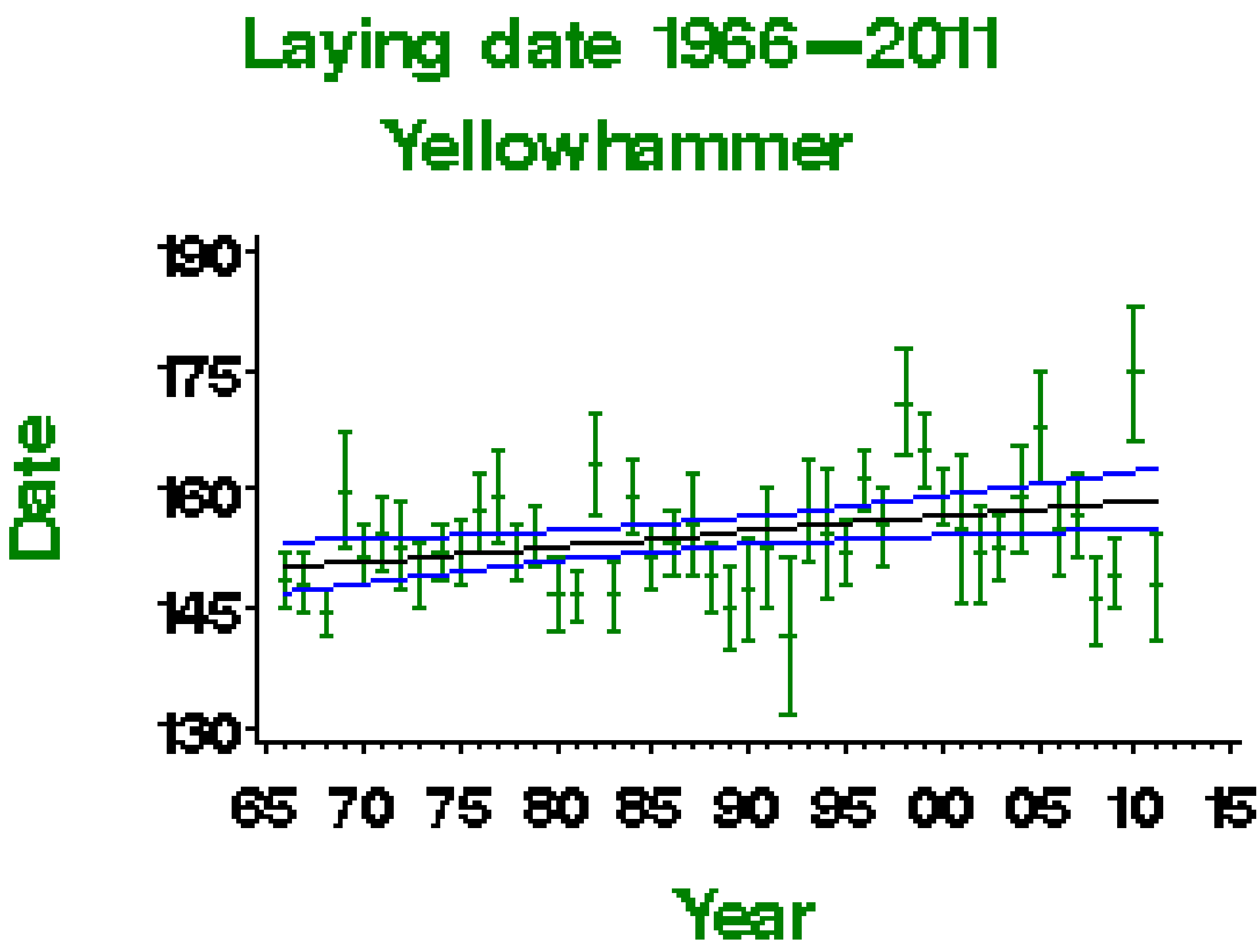


BBS Wales graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

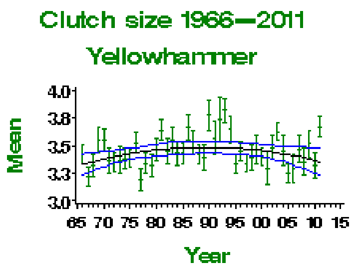


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

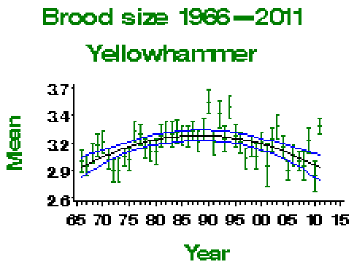
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	49	Curvilinear	0.79 fledglings	1.09 fledglings	37.0%		
Clutch size	42	1968-2010	43	Curvilinear	3.35 eggs	3.37 eggs	0.3%		
Brood size	42	1968-2010	66	Curvilinear	2.96 chicks	2.93 chicks	-1.1%		
Nest failure rate at egg stage	42	1968-2010	63	Curvilinear	4.97% nests/day	3.06% nests/day	-38.4%		
Nest failure rate at chick stage	42	1968-2010	50	Curvilinear	4.46% nests/day	4.24% nests/day	-4.9%		
Laying date	42	1968-2010	26	Linear increase	May 31	Jun 8	8 days		Small sample

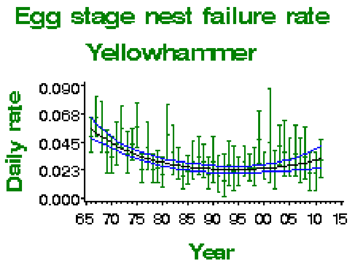
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



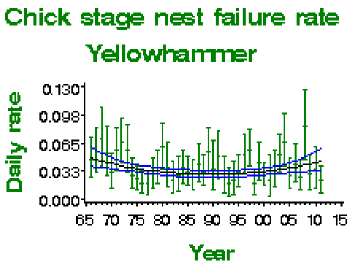
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

Causes of change

Declines in annual survival have been proposed as the demographic mechanism, due to winter resource limitation, although recovery data are sparse and so most evidence for this is indirect.

Change factor	Primary driver	Secondary driver
Demographic	Decreased survival	
Ecological	Agricultural intensification	

Further information on causes of change

Yellowhammer is unique among farmland birds in that its population was stable until the mid 1980s, followed by a decline, suggesting that it alone was affected by some change that occurred in the 1980s (Siriwardena et al. 1998a). Although long-term demographic trends presented here show few linear changes over time (see above), there is some evidence that survival rates decreased during the initial period of decline (Siriwardena et al. 1998b, 2000a, Kyrkos 1997), and that breeding performance tended to improve (Siriwardena et al. 2000b). However, more recent declines in clutch size, brood size and nest success are of NRS concern (Leech & Barimore 2008, and see above).

Best estimates of the variation in adult and first-year Yellowhammer survival (from ring recoveries) suggest that it has been sufficient to explain the species' decline (Kyrkos 1997). Reductions in winter seed availability as a result of agricultural intensification (for example, the loss of winter stubbles and a reduction in weed densities) are widely believed to have contributed to the population decline, presumably through impacts on survival rates. Siriwardena et al. (2007), found that Yellowhammer declines were less steep in areas where the species received more overwinter provisioning, providing experimental evidence for winter resource limitation. Food availability (and therefore, as a conservation measure, supplementary feeding) in late winter appears to be particularly important because demand for seed food is greatest at this time and this is also when the food supply resulting from agri-environment conservation measures is at its lowest (Siriwardena et al. 2007). Further evidence comes from Gillings et al. (2005), who used two, complementary, extensive bird surveys undertaken at the same localities in summer and winter to show that the areas of extensive stubble in winter were correlated with better population performance, presumably because overwinter survival is relatively high. This is supported by another study, in Oxfordshire (Wilson et al. 1996), which found that the only habitat type for which a clear preference was displayed in winter was stubble.

In terms of changes to habitat, Kyrkos et al. (1998) found that Yellowhammer breeding density decreased with increasing proportion of farmland under grassland. It may be that modern improved grassland has neither the weed density required by adult Yellowhammers nor sufficient invertebrate prey for birds feeding nestlings. The dense sward structure of highly fertilised leys may also reduce access to invertebrate prey (Perkins et al. 2000). This is supported by the results of Douglaset al. (2010a) who found that foraging in grass margins was increased by experimental mowing, showing that access to prey in dense vegetation limits feeding activity. Siriwardena et al. (2000b, 2000c) provide further evidence that grazing supported the lowest breeding performance, although the best breeding performance was associated with mixed farmland, suggesting that loss of heterogeneity in the landscape may be a factor in the decline, although they state that this is unlikely to be the main mechanism behind the declines. Bradbury & Stoate (2000) further suggest that loss or degradation of hedges and field margins, loss of stubbles and intensification of grassland management may have reduced nest-site and food availability for farmland Yellowhammers.

Increased use of pesticides may have also played a role in decreasing breeding success. Boatmanet al. (2004) used an experimental set-up to look at the effect of pesticides on breeding performance, and further evidence was provided by Morris et al. (2005), who showed that increased use of pesticides results in reduced invertebrate abundance, lower brood production and fewer chicks fledging. Hart et al. (2006) also demonstrated how insecticide applications can depress Yellowhammer breeding productivity. Whittingham et al. (2005) found that the local availability of rotational set-aside was a good predictor of sites chosen for breeding territories, which could reflect the benefits of both sparse vegetation (access to bare ground for foraging) and lack of pesticide use.

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Reed Bunting

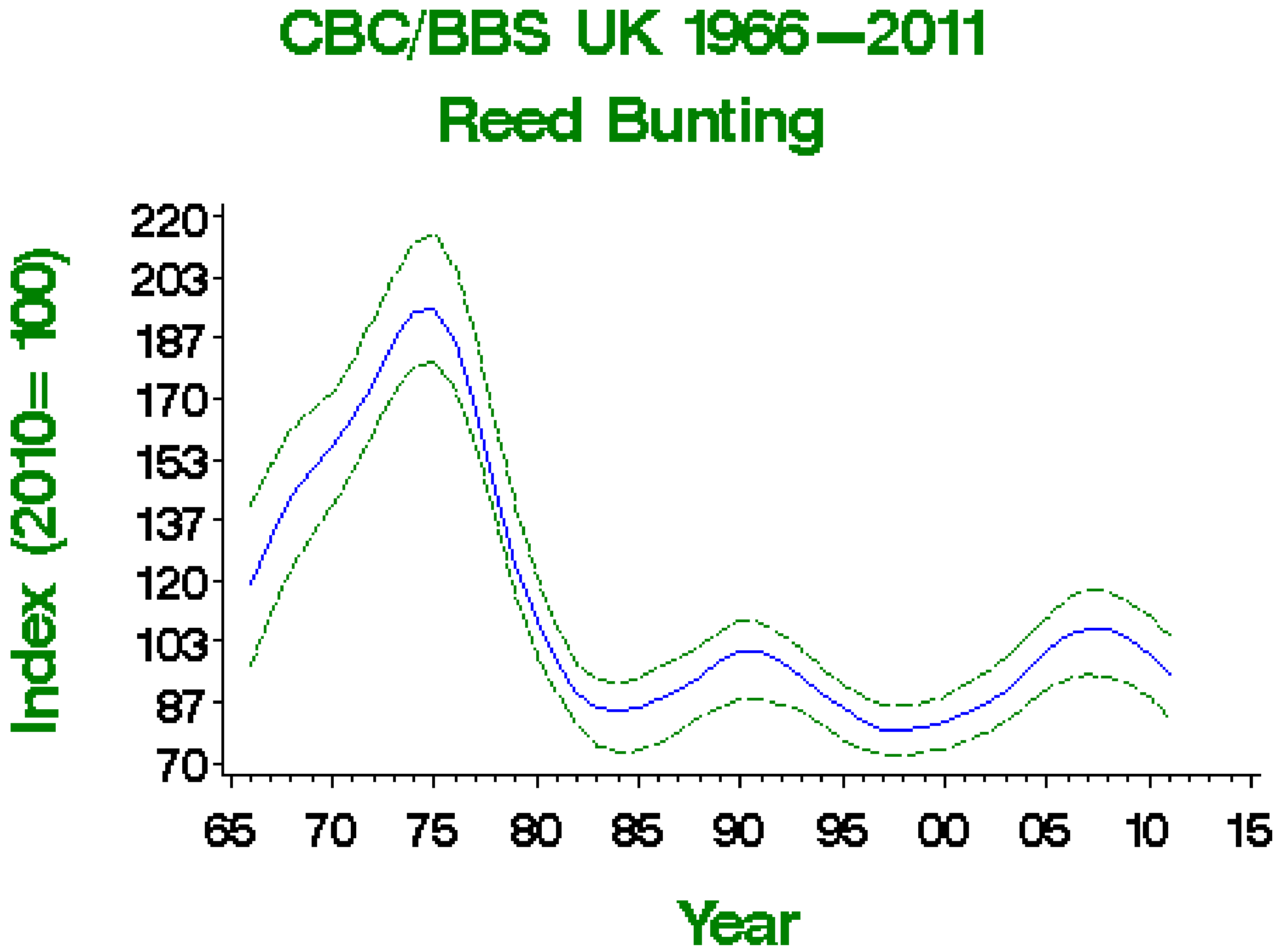
Emberiza schoeniclus

Key facts

Conservation listings:	Europe: no SPEC category (not concentrated in Europe, conservation status favourable) (BiE04) UK: amber (25-50% population decline to 2006) (BoCC3) UK Biodiversity Action Plan: click here, priority species
Long-term trend:	UK, England: shallow decline
Population size:	250,000 territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Status summary

Both CBC/BBS and WBS/WBBS indices declined rapidly during the 1970s, but Reed Bunting abundance subsequently remained remarkably stable. In recent years, results from BBS indicate significant population increase. The BBS Peach et al. 1999). This is supported by a moderate decline in CES productivity and by a major increase in failure rates at the egg stage, which has raised NRS concern (Leech & Barimore 2008). There has been linear decline in numbers of fledglings per breeding attempt. Farmland densities are four times higher in oilseed rape than in cereals or setaside and this crop is crucial in reducing the dependency of the species on wetlands (Gruar et al. 2006). The initial decline placed Reed Bunting on the red list but in 2009, with evidence from BBS of some recovery in numbers, the species was moved from red to amber. There has been widespread moderate decrease across Europe since 1980 (PECBMS 2012a).



Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

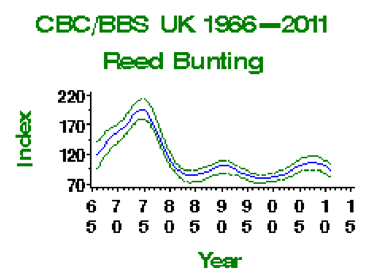
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	240	-24	-40	-2		
	25	1985-2010	338	17	-1	44		
	10	2000-2010	557	23	10	37		

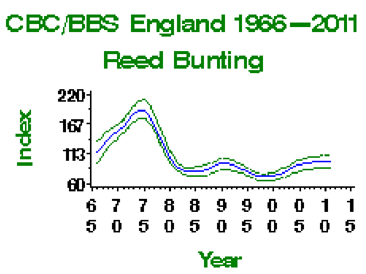
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	5	2005-2010	663	-1	-7	7		
CBC/BBS England	43	1967-2010	188	-21	-41	0		
	25	1985-2010	258	24	3	46		
	10	2000-2010	415	36	25	50		
	5	2005-2010	498	7	1	15		
WBS/WBBS waterways	35	1975-2010	84	-58	-69	-41	>50	
	25	1985-2010	99	-3	-24	31		
	10	2000-2010	144	15	6	28		
	5	2005-2010	145	0	-8	11		
CES adults	26	1984-2010	58	-66	-75	-53	>50	
	25	1985-2010	60	-63	-72	-49	>50	
	10	2000-2010	64	-27	-37	-7	>25	
	5	2005-2010	65	-34	-42	-22	>25	
CES juveniles	26	1984-2010	44	120	-13	420		
	25	1985-2010	45	53	-23	159		
	10	2000-2010	48	16	-9	69		
	5	2005-2010	47	33	3	65		
BBS UK	15	1995-2010	470	24	12	37		
	10	2000-2010	532	24	11	38		
	5	2005-2010	629	2	-4	9		
BBS England	15	1995-2010	352	28	15	40		
	10	2000-2010	396	36	25	49		
	5	2005-2010	472	8	1	14		
BBS Scotland	15	1995-2010	58	31	6	73		
	10	2000-2010	66	13	-13	60		
	5	2005-2010	80	-5	-18	17		
BBS N.Ireland	15	1995-2010	32	-12	-39	45		
	10	2000-2010	37	-12	-40	31		
	5	2005-2010	42	-23	-39	-3		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

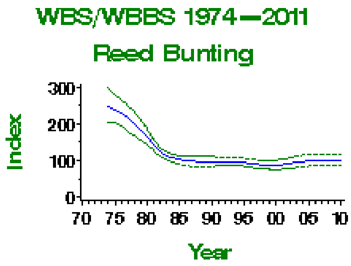
BTO JNCC rspb The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



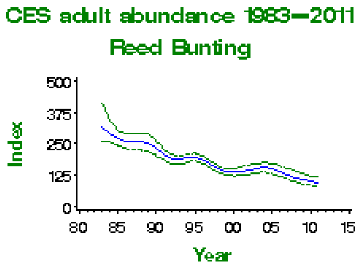
CBC/BBS UK graph



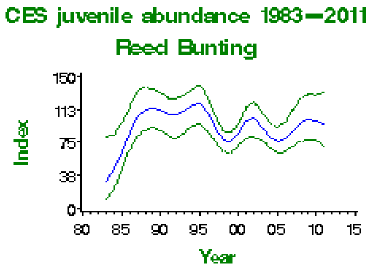
CBC/BBS England graph



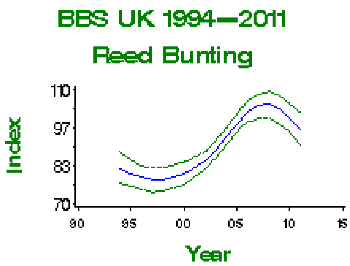
WBS/WBBS waterways graph



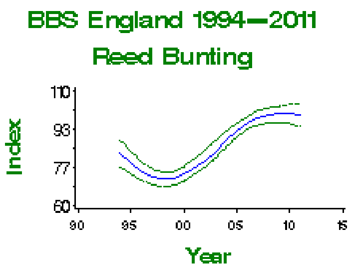
CES adults graph



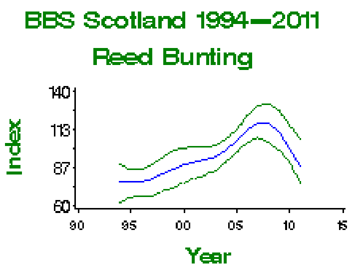
CES juveniles graph



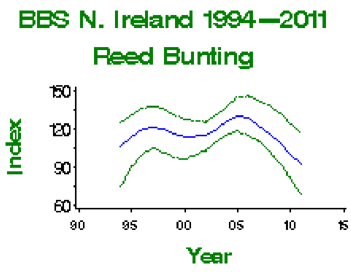
BBS UK graph



BBS England graph

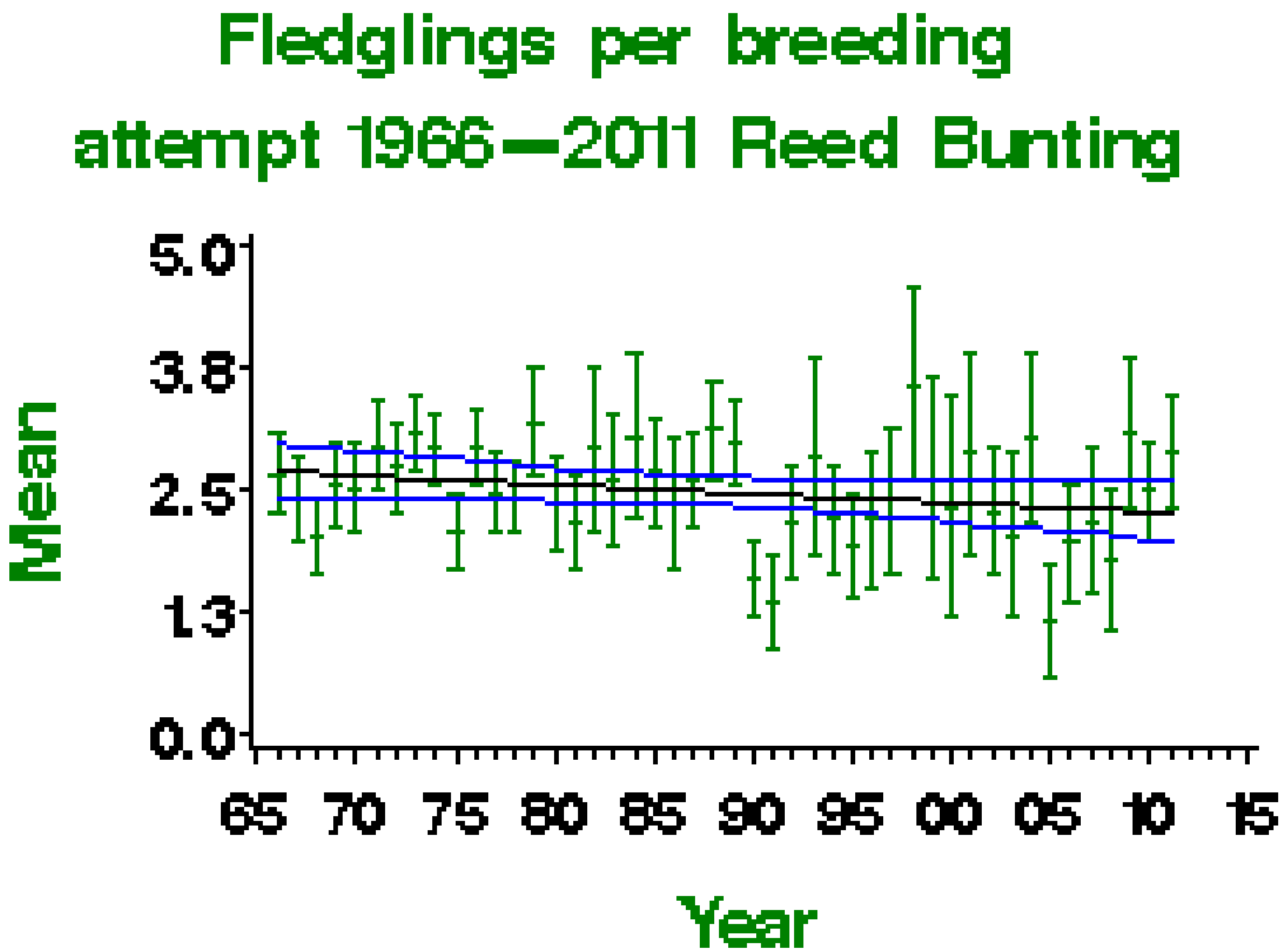


BBS Scotland graph

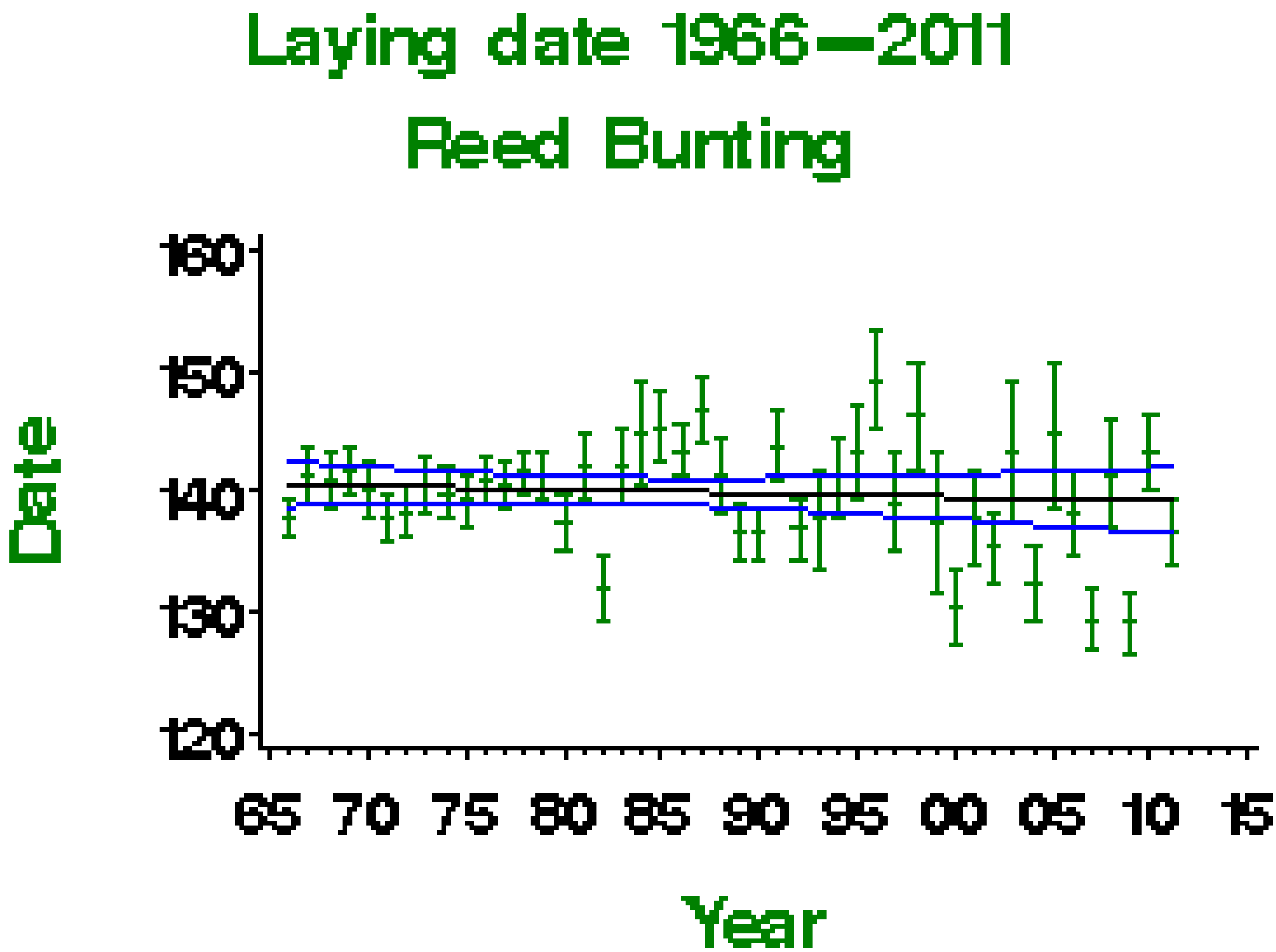


BBS N.Ireland graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

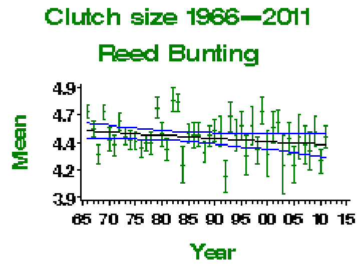


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

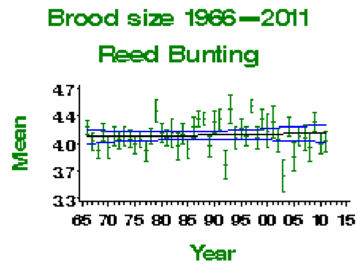
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Fledglings per breeding attempt	42	1968-2010	46	None					
Clutch size	42	1968-2010	44	None					
Brood size	42	1968-2010	61	None					
Nest failure rate at egg stage	42	1968-2010	50	Curvilinear	0.66% nests/day	1.56% nests/day	136.4%		
Nest failure rate at chick stage	42	1968-2010	50	None					
Laying date	42	1968-2010	47	None			0 days		
Juvenile to Adult ratio (CES)	26	1984-2010	61	Smoothed trend	185 Index value	100 Index value	-46%		
Juvenile to Adult ratio (CES)	25	1985-2010	63	Smoothed trend	226 Index value	100 Index value	-56%	>50	
Juvenile to Adult ratio (CES)	10	2000-2010	68	Smoothed trend	118 Index value	100 Index value	-15%		
Juvenile to Adult ratio (CES)	5	2005-2010	69	Smoothed trend	92 Index value	100 Index value	9%		

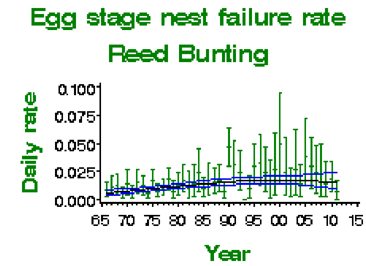
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



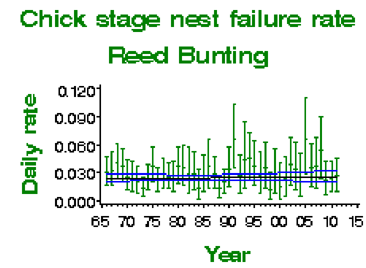
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



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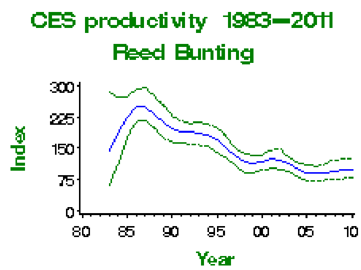
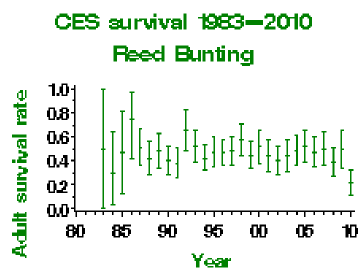


Smoothed long-term trend in ratio of juvenile:adult birds caught - green lines indicate 85% confidence limits



Proportion of adult birds surviving to following year - green bars represent 95% confidence limits

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. (2013). BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report No. 644. BTO, Thetford. https://www.bto.org/birdtrends

Corn Bunting

Emberiza calandra

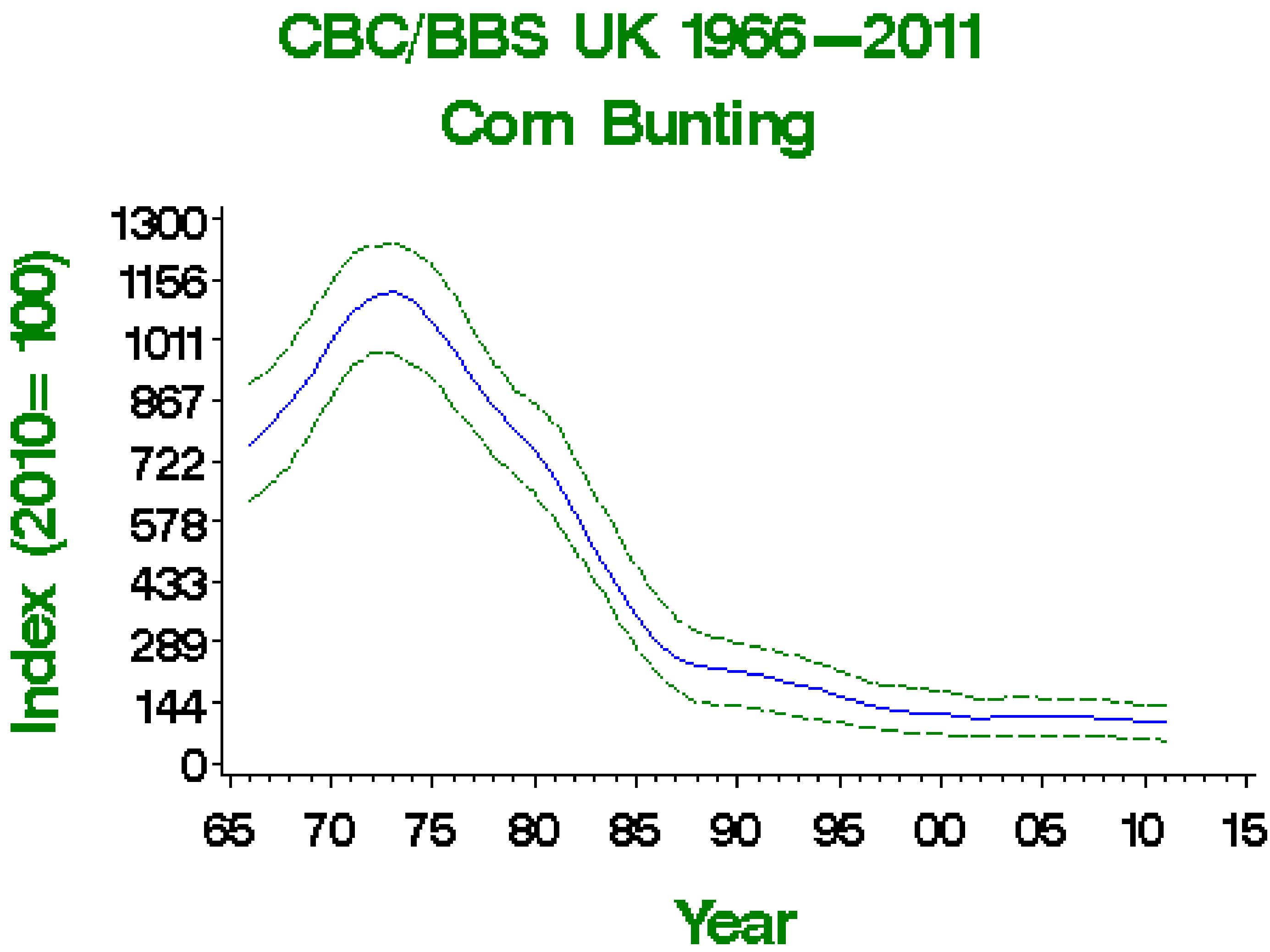
Key facts

Conservation listings:	Europe: SPEC category 2 (declining) (BiE04) UK: red (>50% population decline, historical decline) (BoCC3) UK Biodiversity Action Plan: click here, priority species
Long-term trend:	UK, England: rapid decline
Population size:	11,000 (9,000-13,000) territories in 2009 (APEP13: 1993 estimate (Donald & Evans 1995) updated using CBC/BBS trend)

Migrant status:	Resident
Nesting habitat:	Ground nester
Primary breeding habitat:	Farmland
Secondary breeding habitat:	
Breeding diet:	Animal
Winter diet:	Vegetation

Status summary

Following an earlier, historical decrease, Corn Buntings declined very steeply between the mid 1970s and mid 1980s, with local extinctions across large sections of their former range. Subsequently the decline has continued, but at a reduced rate. Corn Buntings have declined rapidly across Europe since 1980 (PECBMS 2012a) and have declined to extinction in Ireland (Taylor & O'Halloran 2002). With declines across much of its European range, this previously 'secure' species is now provisionally evaluated as 'declining' (BirdLife International 2004).



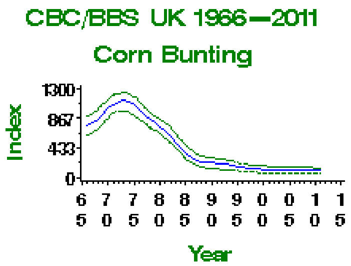
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

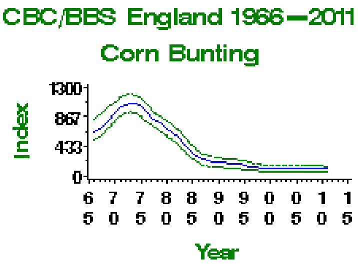
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	43	1967-2010	72	-88	-94	-80	>50	
	25	1985-2010	101	-72	-86	-55	>50	Small CBC sample
	10	2000-2010	138	-13	-32	4		
	5	2005-2010	150	-11	-25	5		
CBC/BBS England	43	1967-2010	68	-86	-93	-73	>50	
	25	1985-2010	97	-70	-84	-50	>50	Small CBC sample
	10	2000-2010	132	-4	-22	15		
	5	2005-2010	144	-11	-28	6		
BBS UK	15	1995-2010	142	-34	-46	-21	>25	
	10	2000-2010	137	-13	-30	1		
	5	2005-2010	150	-7	-19	6		
BBS England	15	1995-2010	136	-31	-45	-18	>25	
	10	2000-2010	131	-7	-23	10		
	5	2005-2010	143	-7	-22	5		

Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

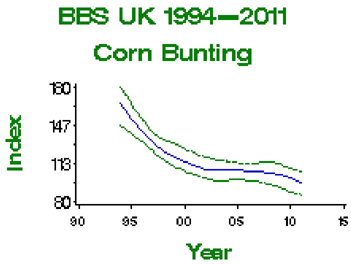
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



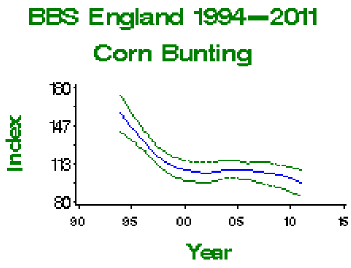
CBC/BBS UK graph



CBC/BBS England graph

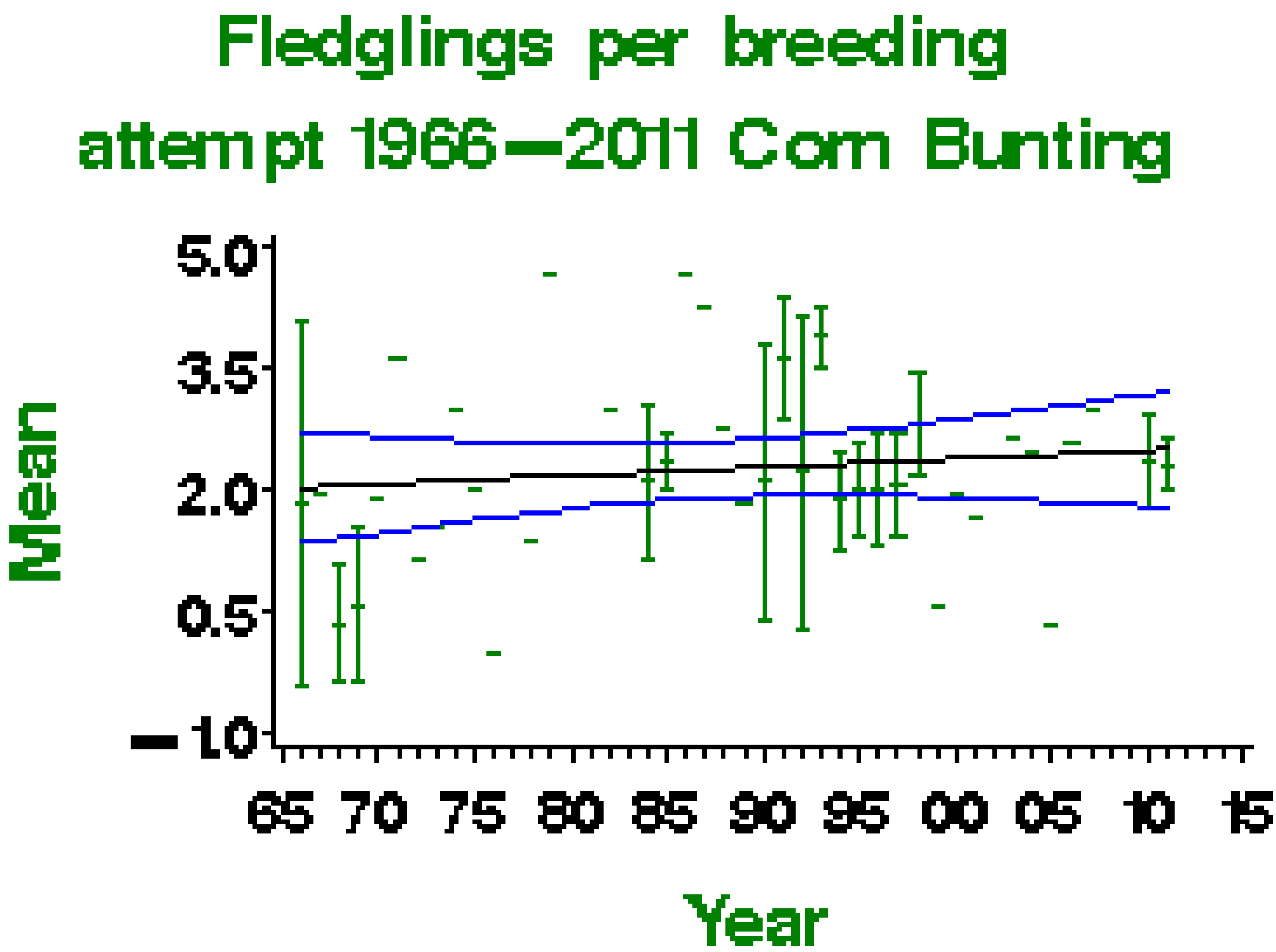


BBS UK graph

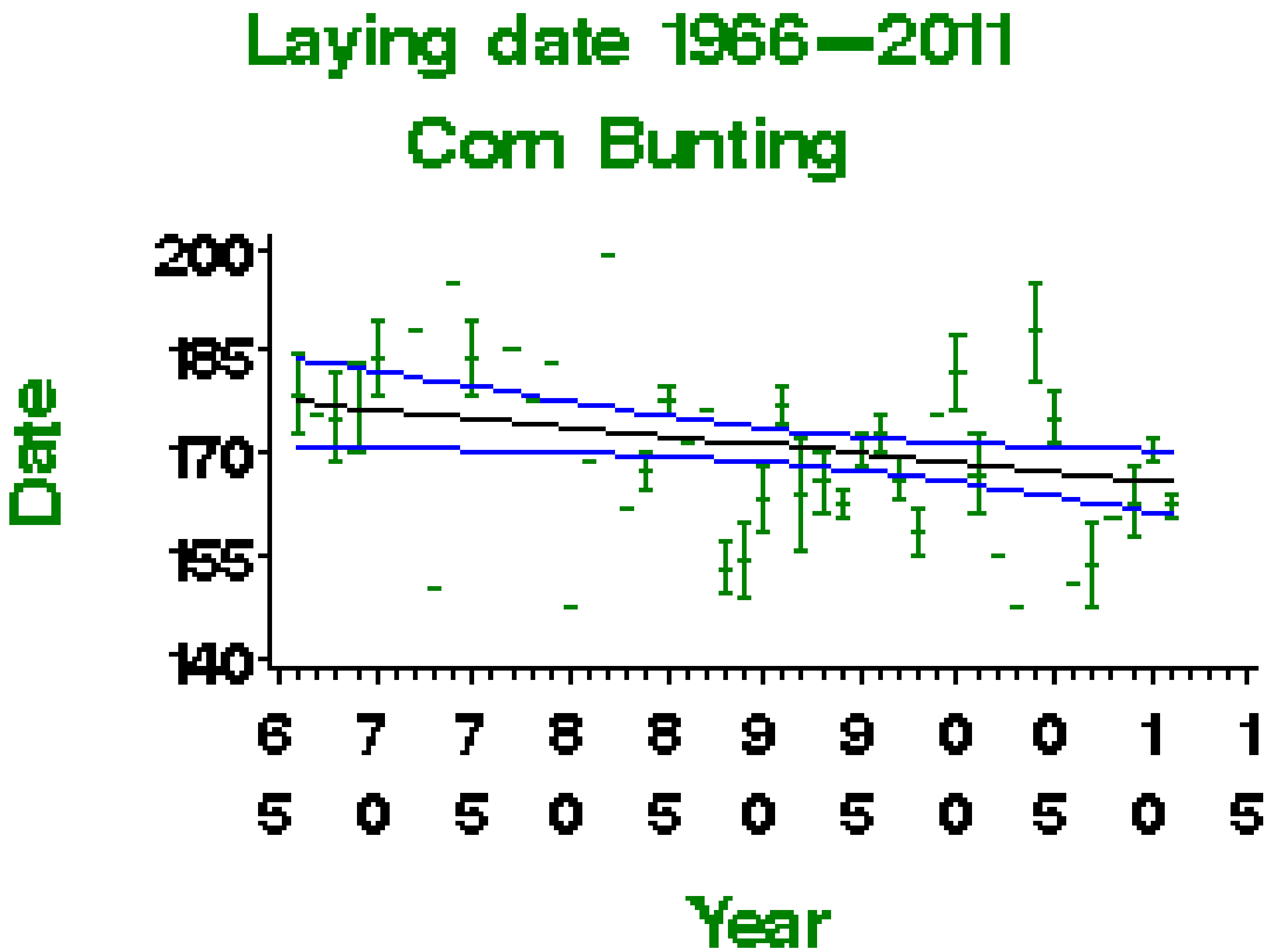


BBS England graph

Demographic trends



Mean number of fledglings produced per nest - green bars represent standard error and black line shows long-term trend

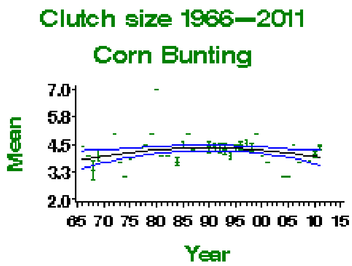


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

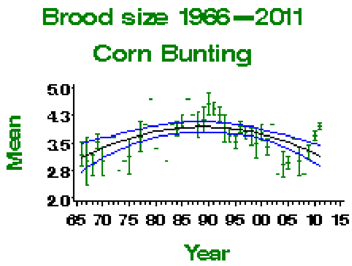
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2010	Change	Alert	Comment
Brood size	42	1968-2010	14	Curvilinear	3.23 chicks	3.22 chicks	-0.2%		Small sample
Nest failure rate at egg stage	42	1968-2010	11	None					Small sample
Nest failure rate at chick stage	42	1968-2010	14	Curvilinear	4.35% nests/day	1.76% nests/day	-59.5%		Small sample
Laying date	42	1968-2010	16	Linear decline	Jun 26	Jun 15	-11 days		Small sample

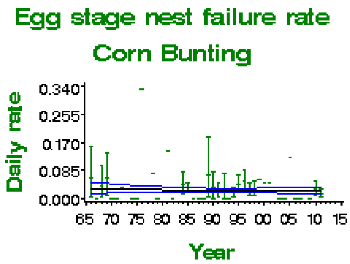
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



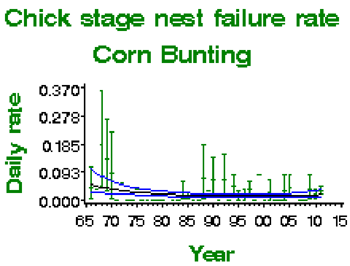
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend

Causes of change

Changes in farming practice are believed to have been responsible for declines, through impacts on reduced seed and/or invertebrate abundance. The demographic causes are unclear and there is conflicting evidence as to whether breeding or wintering effects have been the primary driver.

Change factor	Primary driver	Secondary driver
Demographic	Unknown	
Ecological	Agricultural intensification	

Further information on causes of change

National-scale evidence gives no indication of a historical role for breeding success, but there are contemporary local correlations between agricultural practices and breeding success, including a notable effect on numbers of breeding attempts. Causes of change may be different in different populations, as some of this species' breeding habitats are completely different and isolated from each other. There is no way to test for effects of survival at all. Conversely, it is easy to test for effects on breeding success, especially locally and with respect to contemporary as opposed to historical land-use. This leads to a big imbalance in the amounts of evidence available.

Breeding performance per nesting attempt has increased considerably while population numbers have been declining (Crick 1997, Siriwardena et al. 2000a), but it is also reported that fewer birds now raise a second brood, thus reducing productivity overall (Brickle & Harper 2002). Brood size has decreased since 1990 (see graph above). Ring-recovery sample sizes do not permit an analysis of survival rates, meaning that it is impossible to test for effects of survival (Siriwardena et al. 1998a, 2000a). Any decrease there has been in survival rates is probably a result of the reduction in winter seed availability that has followed from agricultural intensification (Donald 1997, Wilson et al. 2007). Donald & Evans (1994) found that 60% of Corn Buntings fed on winter stubbles, which were the only field type for which a consistent preference was detected.

Spring-sown cereals have been found to be a particularly important habitat for Corn Bunting (Brickle & Harper 2000, Fox & Heldbjerg 2008), and hence its reduction may have contributed to declines, as they provide long-lasting stubbles during the winter and abundant food in the form of surface grain when first sown. In the breeding season, spring cereals were among the most used habitats for nesting and for collecting chick food; territory associations with overhead wires (for songposts) and fallow (positive in early summer, negative in late summer) became stronger in later years as the population declined (Perkins et al. 2012). Siriwardena et al. (2000b) provide evidence that mixed farming at the territory scale supported better breeding performance. However, Donald & Forrest (1995) found little evidence for breeding-season effects in their study using CBC data and suggest that numbers are more likely to have declined due to reduced winter food supplies resulting particularly from the loss of spring tillage, increased pesticide usage and improved harvesting and storage techniques.

A reduction in food availability has been implicated in the declines of this species. In arable-dominated areas in Scotland, Perkins et al. (2011) provide evidence showing that AES management (agri-environment schemes) that increased food availability reversed population declines. However, where a high proportion of Corn Buntings nested in grasslands, an additional AES option that delayed mowing was essential to achieving population increase. Setchfield et al. (2012) have further demonstrated that AES management of cereals can boost productivity and emphasise the importance of delayed harvest to the number and success of late nests.

As part of a PhD study, Brickle (1999) modelled the population dynamics of Corn Buntings in Sussex, concluding that productivity was the most likely cause of decline in the South Downs, also finding evidence of indirect effects of pesticides. Brickle & Harper (1999) identified the main food items of chicks, most of which have declined in abundance on lowland farmland (Campbell et al. 1997). Boatman et al. (2004) further analysed the data from Brickle et al. (2000) and found that arthropod abundance in the vicinity of the nest had a significant effect on the survival of broods, although this was based only on two years' data, whilst Ewald et al. (2002) found that densities of Corn Bunting were higher where the number of pesticide applications was low. Brickle et al. (2000) found that chick weight and nest survival at the nestling stage were respectively positively and negatively correlated with invertebrate food availability, and chick food abundance was negatively correlated with the number of insecticide applications to cereal fields. However, the authors state that the contribution of this reduction in breeding performance to the Corn Bunting's decline depends on the mortality rates for fledged chicks and older birds, information for which is sparse.

Brickle & Harper (2002) found that, although predation accounted for the majority of nest failures in their Corn Bunting study population, there was a seasonal decline in the nest survival rate during incubation, which was largely due to increased losses through farming operations. Furthermore, they speculated that harvesting of cereal crops may reduce the availability of suitable breeding habitat late in the season, thus curtailing the length of the breeding season, and preventing double-brooding. A reduction in fecundity via these mechanisms provides one explanation for the collapse of the Corn Bunting population (Donald 1997, Brickle & Harper 2002).

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Images: Great Spotted Woodpecker, by Sarah Kelman / BTO; Lapwing, by Sarah Kelman / BTO

BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds.

This report is a "one-stop-shop" for information about the population status of our common terrestrial birds. With one page per species, readers can quickly find all the key information about trends in population size and breeding performance as measured by BTO monitoring schemes. It provides an overview of trends for the period 1966–2012.

This report is the third in a series, prepared within the Partnership between the British Trust for Ornithology (BTO) and the Joint Nature Conservation Committee (JNCC) (on behalf of Natural England, Scottish Natural Heritage, Countryside Council for Wales and the Environment & Heritage Service of Northern Ireland) as part of its programme of research into nature conservation.

It is the result of the sustained long-term fieldwork efforts of many thousands of the BTO's volunteer supporters. Without their enthusiasm for collecting these hard-won facts, the cause of conservation in the UK would be very much the poorer.

Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Eglington, S.M., Johnston, A., Noble, D.G., Barimore, C., Kew, A.J., Downie, I.S., Risely, K. & Robinson, R.A. 2013. BirdTrends 2012: trends in numbers, breeding success and survival for UK breeding birds.. *BTO Research Report* **644**, BTO, Thetford, UK.

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