BTO RESEARCH REPORT 662

BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds.

Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A.

Birds Science People

BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds

House Martin, now with a statistically significant long-term decline of 69%, is the subject of special BTO surveys in 2015-16.

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 120 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. 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
- Wherever possible, trends 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 45 years).

Text, tables, graphs and presentation for each species 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. There are new pages this year for Gadwall, Little Egret and Common Tern.

There is far more to this report besides the species pages! 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 700 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.The Key findings page provides a brief overview of our main findings this year.

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, Carl Barimore, Daria Dadam, Sarah Harris, Allison Kew, Iain Downie, David Noble, Kate Risely and Rob Robinson. The recommended citation for the report is as follows, and is given in the page footer throughout the report:

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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

Little Grebe joins the list of species with a significant decline of more than 50% long term.

In the current report, there are 28 species for which our best long-term trends show statistically significant population declines of greater than 50% over periods of 35–45 years (see Latest long-term alerts).

These are Grey Partridge, Little Grebe, Lapwing, Redshank, Woodcock, Snipe, Turtle Dove, Cuckoo, Little Owl, Willow Tit, Marsh Tit, Skylark, House Martin, Willow Warbler, Whitethroat, Starling, Song Thrush, Mistle Thrush, Spotted Flycatcher, House Sparrow, Tree Sparrow, Yellow Wagtail, Grey Wagtail, Tree Pipit, Linnet, Lesser Redpoll, Yellowhammer and Corn Bunting (taxonomic order). Little Grebe and House Martin are additions since *BirdTrends 2013*.

One further species shows a non-significant decline greater than 50% over a long timescale. Change for Lesser Spotted Woodpecker is non-significant only because its monitoring period ceased in 1999: further strong decline has since been logged by Atlas data.

The steepest long-term populations declines we have measured are for Turtle Dove, Tree Sparrow, Snipe, Willow Tit and Grey Partridge, which have all declined by 90% or more since 1967, as almost certainly has Lesser Spotted Woodpecker. Turtle Dove shows the biggest long-term decline of any species in this report, overtaking Tree Sparrow which, following earlier rapid decline, has increased strongly since 1994.

These 28 species that have halved outweigh the 18 species found to show an equivalent increase, i.e. a doubling of population size, over similar periods (see Positive changes). The gap between these two groups has widened successively in recent years.

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). Nine species among those that have declined the most are listed only as amber and may be candidates for red listing at the next review: these are Little Grebe, Redshank, Woodcock, Snipe, House Martin, Willow Warbler, Whitethroat, Mistle Thrush and Grey Wagtail.

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

In addition, Curlew (amber-listed) has also declined by more than 25%, but raises no formal long-term alert because the confidence interval around its change estimate is too wide.

Three scarcer species with much shorter monitoring histories have also decreased by more than half during just a 17-year period: Wood Warbler (red listed), 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

An outbreak of respiratory disease has reduced Greenfinch population levels far enough to raise an alert for this species for the first time.

The *BirdTrends* report raises species 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%. Amber and red listings use similar criteria but are reviewed only at intervals of around seven years: thus this report's annual alerts provide valuable updates of current conservation concern.

Species with declines close to these threshold values often change category between years. The latest data indicates, however, that just three adjustments are needed to the long-term alerts since *BirdTrends 2013*. These are all in respect of species joining the alert category as a whole, of which two enter at the higher alert level.

House Martin and Little Grebe are hard to survey and trends calculated for them have unusually wide confidence intervals. Since*BirdTrends 2013*, their trends have become statistically significant and they both enter the higher alert category with long-tern declines of -69% (45 years) and -53% (37 years) respectively. These species are both among nine amber-listed birds of conservation concern that currently meet red-list criteria for population decline (see Declining species).

The Greenfinch population was rising steeply from the mid 1980s to 2006. Since that year, however, its numbers have been in steep decline, to the point where the 45-year trend (now -26%) raises an alert at the lower level. Trichomonosis, likely to be the sole cause of this reversal, remains evident in the population. Greenfinch is among three green-listed birds that currently meet amber-list criteria for population decline (see Declining species).

Positive changes

Little Egret, which shows the steepest population increase our monitoring has ever recorded, is included in *BirdTrends* this year for the first time.

Although much of this report focuses on declines and their conservation significance, there are many species that are increasingly strongly as UK breeding birds.

In the current report, there are 18 species for which our most representative long-term trends show a statistically significant doubling in population size over periods of 31–45 years.

These are Mute Swan, Canada Goose, Shelduck, Mallard, Sparrowhawk, Buzzard, Coot, Stock Dove, Woodpigeon, Collared Dove, Green Woodpecker, Great Spotted Woodpecker, Magpie, Jackdaw, Carrion Crow, Great Tit, Blackcap and Nuthatch (taxonomic order).

The steepest long-term increases we have measured have been forBuzzard, Great Spotted Woodpecker and Collared Dove, which have all increased by more than 300% since 1967.

These 18 species are directly equivalent to the 28 that have halved in number over similar periods (see Declining species). The gap between these two totals has widened by a further four species since *BirdTrends 2013*.

Seven further species, monitored only over shorter periods have also more than doubled (while three equivalent species have more than halved)Cetti's Warbler numbers have risen by 384% since 1987 and those of Greylag Goose by 418% since 1993. Just since 1995, increases above 100% have been recorded forGadwall (+107%), Barn Owl (+277%), Red Kite (+805%), the non-native Ring-necked Parakeet (+1060%) and Little Egret (+1666%), included in this report now for the first time.

For six species that are listed red or amber for population decline over the long term –Red Grouse, Willow Warbler, Grasshopper Warbler, House Sparrow, Yellowhammer, Reed Bunting and Corn Bunting – decline has started to level off, or has ceased, during the recent ten-year period. Signs of recovery noted last year for Little Grebe, Skylark, Song Thrush, Linnet and Lesser Redpoll are no longer evident.

Five further formerly declining species – Whitethroat, Dunnock, Tree Sparrow, Bullfinch and Lesser Redpoll – have reversed their population trend to show significant increases over the last ten years. For most of these species, however, population levels remain severely depleted, despite the recent increases.

Reduced breeding success

Both NRS and CES data indicate that Garden Warbler breeding success has declined significantly.

Our best measure of nest-level breeding success is Fledglings Per Breeding Attempt (FPBA), calculated from brood sizes and nest failure rates recorded by participants in the Nest Record Scheme, which indicates the mean number of young fledging from each nest in a given year.

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

Productivity declines of the migrants Nightjar, Willow Warbler, Garden Warbler, Sedge Warbler and Tree Pipit 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 reliant on seasonal peaks in caterpillars, such as Chaffinch and, to a lesser extent, Coal Tit and Treecreeper. However, for species such as these and Greenfinch, where numbers have increased over the same period, we cannot exclude the possibility that reduced breeding success is due to a density-dependent increase in intraspecific competition. Lack of food for nestling and breeding female Linnet due to a paucity of stubbles and weeds in more intensively farmed agricultural habitats may have contributed to the reduction in the species' breeding success, while loss of cover and food due to increased grazing pressure from deer may be implicated in Dunnock and Bullfinch declines. The driver for increased Moorhen nest failure is at present unclear, but increases in aquatic mammalian predators and Coot populations have been proposed.

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 11 of the species monitored. The productivity of Blue Tit, Willow Tit, Garden Warbler, Sedge Warbler, Goldfinch and Reed Bunting has fallen by more than 50% over the last 25 years, while Great Tit, Willow Warbler, Blackcap, Song Thrush and Blackbird show reductions of between 25% and 50%. For species such as Blue Tit, Great Tit, Blackcap and Goldfinch, 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. Song Thrush, Blackbird and Sedge Warbler have experienced significant declines in abundance, either on CES sites or more widely (based on CBC/BBS figures), but previous analyses suggest that falling survival rates are likely to have been a more important contributor to population changes than reduced productivity. There is some evidence that a reduction in the number of offspring produced may be the driver of Willow Warbler declines, however, and may also be preventing recovery of the UK Reed Bunting population.

Increased breeding success

An increase in Nuthatch breeding success may have helped to drive the increase in both population size and range exhibited by this species.

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 46 years for 29 species, across a wide range of taxonomic groups. Population trends are also upward for 16 of these species, including raptors (Sparrowhawk, Buzzard, Barn Owl, Merlin, Peregrine), pigeons (Stock Dove, Woodpigeon, Collared Dove), corvids (Magpie, Jackdaw, Carrion Crow), and some small passerines (Nuthatch, Wren, Robin and Redstart). It is therefore possible that increasing productivity has contributed to the population growth exhibited by these species over recent decades.

Conversely, 12 species (Tawny Owl, Kestrel, Starling, Dipper, Blackbird, Wheatear, Dunnock, House Sparrow, Tree Sparrow, Grey Wagtail, Meadow Pipit, Yellowhammer and Corn Bunting), 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, reproductive output has risen significantly for two species, Reed Warbler and Chaffinch. Increased breeding success for multi-brooded species such as Reed Warbler might be predicted if climatic change permits an extension of the breeding season, but the discrepancy between this trend and the decline in breeding success identified by the NRS for the single-brooded Chaffinch warrants further study.

Early breeding

One of our earliest breeders, the Long-tailed Tit now lays its eggs 17 days earlier than in the mid 1960s.

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 30 days earlier, on average, than in the mid 1960s. Only five 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 – 8 days), waterbirds (Moorhen – 5 days), waders (Oystercatcher – 3 days), migrant insectivores (Pied Flycatcher – 12 days, Swallow – 8 days), resident insectivores (Robin – 10 days, Blue Tit – 12 days), corvids (Magpie – 30 days) and resident seed-eaters (Greenfinch – 19 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 at lower trophic levels (such as the food birds eat) than at higher levels (such as the birds themselves), increasing the potential for disjunction and resulting productivity declines. However, the evidence for for a population-level effect of reduction in breeding success is mixed and more research is needed to determine the extent to which declines in abundance will result.

Only five species demonstrate a significant delay in average laying dates: Woodpigeon, Skylark, Blackbird, Bullfinch and Yellowhammer. All of these species initiate multiple breeding attempts per season and there is increasing evidence that birds less reliant on seasonal peaks in resource availability may be able to extend their breeding seasons further into the summer, resulting in a later mean value for laying date.

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 volunteer observers, 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 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* but this is now the 'BirdTrends report', with an informal title that matches its web link.

All the commonest and most widespread UK breeding bird species have a BirdTrends page, updated annually to incorporate the latest survey data and assessments of trends. Colonial seabirds, which are well covered by the results of Seabird 2000 (Mitchell *et al.* 2004) and by the JNCC's Seabird Monitoring Programme (Heubeck 2013), and species covered by the Rare Breeding Birds Panel (Holling & RBBP 2007b, 2008, 2009, 2010a, 2010b, 2011b, 2012, 2013), are in general not included here – though with a handful of exceptions.

The main emphasis of this report is on trends in the abundance and demography of individual breeding species. 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.

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 (PECBMS 2014b).

Trends in wintering populations of waterfowl are covered by the Wetland Bird Survey annual reports, also now fully available online (Austin *et al.* 2014), and by the *WeBS alerts* system (Cook *et al.* 2013).

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:

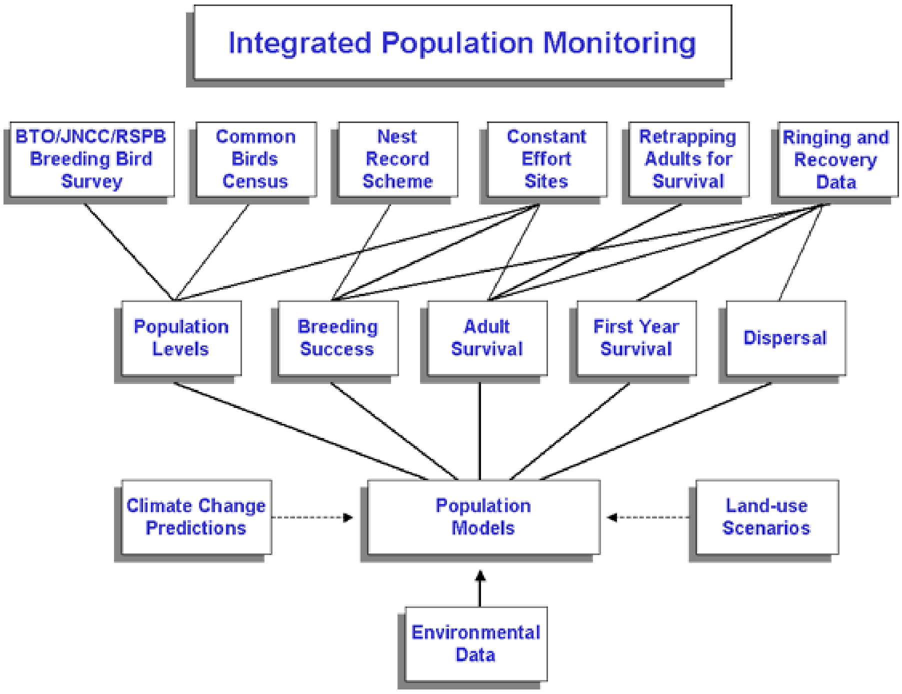
- the Nest Record Scheme – which began in 1939 and collates standardised information on up to 35,000 individual nesting attempts per year. This allows the measurement of:
  - laying dates
  - clutch sizes
  - brood sizes
  - nesting success during egg and chick stages
  - fledglings per breeding attempt (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. As this report demonstrates, however, there are many species for which BTO already holds the necessary data, collected by volunteer observers 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 Integrated population analysis'.

Biodiversity Action Plans

The ability to quickly determine the stage of the life cycle exerting the greatest influence on population declines is particularly important for the conservation agencies when considering remedial action for 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 BirdTrends report 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, reproductive performance and survival rate for birds covered by BTO monitoring schemes since the 1960s, at the UK and UK-country scales.
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.

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. The conservation community owes them all an enormous debt of gratitude for their work. Without their enthusiasm, the cause of conservation in the UK would be very much the poorer.

We are also very grateful to the many 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, Richard Bashford, 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 being managed 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 in turn, 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).

The two final parts of the methods section concern the alert system. 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.

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 spread 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 had been used by the CBC. The average time observers spend per visit on counting birds is only around 90 minutes and, even with travel and data-input time, this survey is relatively quick to undertake and is therefore accessible to a large number of volunteers. 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 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 (1%).

An important aspect of BBS is its coordination through a network of volunteer BBS Regional Organisers. The Regional Organisers find and encourage willing volunteers for their squares and provide paper forms as required. Since 2003, when online submission of BBS data was introduced, most data have been returned online – 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 2,205 in 2002 and had increased further to 2,327 squares in 2003, 2,533 in 2004, 2,892 in 2005 and 3,311 in 2006. The sample soared to 3,728 in 2007 and is currently running marginally below that level (Harris *et al.* 2014). Squares are distributed throughout the UK and cover a broad range of habitats, including uplands and urban areas. There are 110 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, Harris *et al.* 2014), although a few present special difficulties because of their colonial or flocking habit or their wide-ranging behaviour. For most of these 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, which in most cases are the standard BTO regions. 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 regional differences in sampling density into account.

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 there, 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 alongside a smoothed trend and its 85% confidence limits. 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.

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 (Marchant 1983). 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 (25 inches to the mile). 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 a small team of trained BTO staff, applying rigorous guidelines, for maximum 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 contemporaneous habitat features, providing the potential for detailed studies of bird–habitat relationships.

In 1990, the results from the CBC 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 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, they might 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).

The results from the CBC provided reliable population trends for more than 60 of the UK's commoner breeding species and, through the linking of CBC with BBS to form this report's long-term trends, continue to be hugely influential in determining conservation priorities in the UK countryside. The archive of detailed maps of almost a million birds' territories, collected through the CBC and maintained at BTO HQ 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.

Validation studies

The CBC was the first national breeding bird monitoring scheme of its kind anywhere in the world and its contribution is widely recognised. 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 a third of 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.

CBC-only graphs and tabulated trends are presented in this report for a small number of species whose numbers have become too depleted for annual monitoring to continue. Smoothed indices are plotted as the blue line on these graphs. The two green lines on the graphs, above and below the index line, are the upper and lower 85% confidence limits. 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 might 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 the

Common Birds 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 better coverage of 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).

Data analysis

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 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 total 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 intervals. However this compromise was necessary to make it possible to fit the trends within a reasonable amount of computer time (still several weeks).

Data presentation

Indices are plotted on the graphs as annual estimates, with a smoothed trend and its 85% confidence interval.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.

Waterways Bird Survey & Waterways Breeding Bird Survey

Waterways Bird Survey 1974–2007

The Waterways Bird Survey (WBS) monitored the population trends of riparian bird species on canals and rivers throughout the UK during the breeding seasons of 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 maps (six inches to the mile). 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, includingMute Swan, Goosander, Little Grebe, Common Sandpiper, Kingfisher, Sand Martin, Reed Warbler, Dipper and Grey Wagtail, targeted surveys along waterways can provide a better precision of monitoring than is possible through the more generalised BBS surveys. Waterways indices can also add a new perspective on trends in waterbirds that are monitored, largely in different habitats, by CBC/BBS. For Lapwing, for example, 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 limitations as a monitoring scheme similar to those 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 only covered 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 continues 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 2014, it began collecting most of its data online via the BBS web pages.

Trends are available from WBBS alone for more than 80 species. These include the waterbirds previously covered by WBS and a further range of common species for which waterways are not the primary habitat. WBBS-only trends are of relatively short duration (since 1998) and are not presented in this report.

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 and presentation

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, herons potentially are excellent indicators of environmental health in the countryside. They build large stick nests, mostly in colonies at traditional sites, thus lending themselves to direct counts 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 UK 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 requested from all breeding sites, whether or not Grey Herons are also present. Data submitted for the Heronries Census for Little Egrets and other rare species are shared with the Rare Breeding Birds Panel, who hold the more complete data sets. Counts ofCormorant colonies, which often occur alongside heronries, are also recorded and contribute to broader monitoring of that species (Newson *et al*. 2007, 2013).

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. The number of heronries counted each year has grown in recent years to more than 600. 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. Around 90 heronries in Northern Ireland are currently reported each year.

Online data submission is being made available for Heronries Census observers for the first time in 2015.

Data analysis

Population changes are estimated using a ratio-estimators approach derived from that described by 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. The population model also allows for cases where the extinction of colonies and the establishment of new ones had not been observed directly (Marchant *et al*. 2004).

Data presentation

On the Grey Heron page of this report, the UK trend is presented graphically as annual estimates of apparently occupied nests, with a smoothed trend and its 85% confidence limits. The smooth trend line is based on a non-parametric regression model, using thin-plate smoothing splines with degrees of freedom one-third the number of years in the model. Trends are also shown for England and Wales together, and for England, Wales and Scotland alone.

Visit the Heronries Census page of the 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 over 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 24 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 model (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 only relative figures, 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 net rides. 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 a smoothed trend and its 85% confidence limits. No trend is currently fitted to the survival data, but the individual estimates are presented with 95% confidence limits. A caveat is provided for 'Small samples' when the average number of plots per year is between 10 and 20.

Visit the CES section of the 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. As with CES, between-year recaptures of ringed birds are used to calculate annual survival rates of adults (Peach 1993).

Each RAS project targets an individual species and operates within a defined study area, aiming to catch or resight the majority of the adults breeding within the site each year. RAS ringers often employ colour rings to increase the probability of detecting returning individuals. The minimum annual sample size should ideally be sufficient to include 30 individuals retrapped or resighted 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 trends in survival rate. Examples of analyses of RAS data have been published by Robinson *et al.* (2008, 2010).

The RAS scheme was launched in 1998 and around 160 projects are currently active, covering more than 50 species in total, and data for several of these are presented in this report. Study sites are well distributed throughout the UK.

Data analysis and presentation

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.

Visit the RAS section of the 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 employs the most advanced and efficient techniques of data gathering, data capture and analysis (Crick *et al.* 2003). BTO now holds more than 1.3 million nest records, of which 69% arealready 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) or *Nest Record News* 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, 2002, Brown *et al.* 1995, Peach *et al.* 1995a, Crick 1997, Chamberlain & Crick 1999, 2003, Siriwardena *et al.* 2001, 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, or submit computerised data, giving details of nest site, habitat, contents of the nest at each visit and evidence for success or failure. When cards are received by the BTO staff, they 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 and rates of nest loss at the egg and chick stages.

Currently the BTO collects a total of more than 40,000 records each year for around 180 species. Typically, there are more than 150 records for 50 species and more than 100 for a further 20 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. Nest recording has subsequently become a module within IPMR, the program through which ringing data are currently collected. The general distribution of completed nest records 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, 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 are 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 (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 × HS × (1 – EF)EP × (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 better-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 illustration.

Data presentation

Results are presented only if the mean sample size of records for a particular variable and species exceeds 10 per year, and are presented with a caveat for small sample sizes if the mean number of records contributing data was between 10 and 30 per year.

Visit the Nest Record Scheme section of the BTO website.

Integrated population analysis

The BTO operates, in partnership with others, several schemes aimed at monitoring the numbers and demography of a range of widespread UK birds. A key aim of this monitoring is to investigate how and why bird populations change, and thus to make species conservation more effective and to contribute evidence that supports the conservation of wider biodiversity and the environment. All population changes are a consequence of underlying demographic factors, which are themselves determined largely by environmental conditions. Thus analyses of trends in numbers (from BBS, CES and other schemes) are complemented by the Ringing and Nest Record schemes which aim to monitor demographic patterns underlying population changes.

Populations may change because the number of individuals either entering the population (productivity) or leaving it (survival) changes. For an island such as Britain, immigration and emigration, which may also cause changes at more local scales, can be safely ignored (e.g. Robinson *et al.* 2012). To gain a full picture of how these processes operate, it is best to consider them simultaneously (along with the changes in numbers) in an integrated fashion and, ideally, incorporate them into a single statistical model (Besbeas *et al.* 2002, Buckland *et al.* 2004, Brooks *et al.* 2004). This is for a number of reasons. Firstly, it makes most efficient use of all the collected data and can help quantify processes for which the available data are sparse. Secondly, such factors might interact, through processes like density dependence, so to understand the consequences fully, they cannot be viewed in isolation. Thirdly, and perhaps most importantly, we do not have data on all the processes – for instance, the proportion of adults breeding or the number of nesting attempts made by individuals of multi-brooded species can be really hard to measure. By constructing an integrated model we can acknowledge this uncertainty and assess to what extent it affects our conclusions about the causes of population change.

Robinson *et al.* (2014) constructed integrated population models (IPMs) for 17 species of common birds. They did this using newly developed statistical techniques which, although they require a lot of computing power, enable one to combine data from different sources, by specifying a common underlying model – in our case of population change. Information on changes in numbers came from the CBC and BBS schemes, information on brood sizes (for some species) and nest success from the Nest Record Scheme and information on brood size (for some species) and survival of young and adult birds from the Ringing Scheme, with the number of individuals ringed and subsequently found dead (mostly by members of the public) enumerated for each year.

The population size in any given year (N_{t+1}) depends on the population size in the previous year (N_t) as follows:

$$N_{t+1} = 0.5N_t\,\rho_t\,(B_t\,\varphi_{egg,t}\,\varphi_{yng,t}\,\varphi_{fy,t}) + N_t\,\varphi_{ad,t}$$

where B represents the mean brood size, φ_{egg} and φ_{yng} survival of the nest at the egg and chick stages, φ_{fy} survival during the first year following hatching (which for some species we can separate into the post-fledging and first-winter periods) and φ_{ad} adult survival, all in year *t* (Robinson *et al.* 2014). The final parameter, ρ, represents the unmeasured demographic rates, i.e. the number of adults actually breeding, the number of nesting attempts made (particularly in multi-brooded species) and (for some species) survival during the post-fledging period. We employed a Bayesian state-space approach (Brooks *et al.* 2004), generating five sets of 200,000 samples (of which we discarded the first 100,000 as 'burn-in' and kept every 50th to minimise autocorrelation) using uninformative priors and the MCMC sampling algorithm in JAGS (Plummer 2003). For further details see Robinson *et al.* (2014).

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 has been described in detail by Baillie & Rehfisch (2006). It also identifies cases where long-term declines have reversed, leading to an improvement in conservation status. It must be stressed that the alerts and reversals reported here are advisory and do not supersede the agreed, longer-term 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 five 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, if around 50%, different levels of alert in different years.

Data for 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 typically show long-term changes that are complex and 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 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. 2014) we have analyses of monitoring data up to year *x*-1 (e.g. 2013). As we drop the final year of the smoothed time series, we report here on change measures up to year *x*-2 (e.g. 2012).

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), with population changes 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 interval does 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.

For CBC data 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 20 plots (when rounded to a whole number) is flagged as a small sample. For BBS indices for individual countries a mean in the range 30–40 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 presents an overview of how the alert system works. More detail is given below about the statistical methods used to estimate 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	1966–2013	48	16
WBS/WBBS	1974–2013	40	13
Breeding Bird Survey	1994–2013	20	6
Heronries Census	1928–2013	86	29
Constant Effort Sites	1983–2013	31	10

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).

Such a method of analysis cannot be easily applied within a GAM framework. Therefore we fitted a smooth curve to the annual population estimates. 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. Bootstrapped confidence intervals, where available, are thus presented instead for the Grey Heron trend.

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

Hawks
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
Gadwall
Mallard
Tufted Duck
Goosander
GAMEBIRDS
Red-legged Partridge
Red Grouse
Grey Partridge
Pheasant
WATERBIRDS
Red-throated Diver
Cormorant
Little Egret
Grey Heron
Little Grebe
Great Crested Grebe
HAWKS, etc
Red Kite
Hen Harrier
Sparrowhawk
Buzzard
Moorhen
Coot
WADERS, etc
Oystercatcher
Golden Plover
Lapwing
Ringed Plover
Curlew
Common Sandpiper
Redshank
Woodcock
Snipe
Common Tern
PIGEONS, etc
Feral Pigeon
Stock Dove
Woodpigeon
Collared Dove
Turtle Dove
Cuckoo
OWLS, etc
Barn Owl
Little Owl
Tawny Owl

Siskin
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 2014), a separate web site produced by a partnership of which both BTO and JNCC are 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
Roseate Tern
Arctic Tern
Little Tern
Guillemot
Razorbill
Black Guillemot
Puffin

Key to species texts

The 120 species in this report can be accessed in any order, via alphabetic and taxonomic lists. The taxonomic sequence is that maintained 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 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: population estimates, trends and conservation status* (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 and IUCN (www.birdlife.org/datazone/species/search)
   - 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 were 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 were 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 made use of more recent material where available
   - Historical decline (in UK over the period 1800–1995) was assessed by literature review

   For the first time, BoCC3 has classifird 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.

   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 currently requires all breeding records to be submitted.

2. Long-term trend: This summarises the headline 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 (Stone *et al.* 1997, Baker *et al.* 2006, Musgrove *et al.* 2013). 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 estimate 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 11, 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, headline 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. Generally for these graphs there are annual estimates (dots), with a smoothed trend line and its 85% confidence interval. The Methods section provides details about how the trend data are calculated for each scheme. Index values 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. A narrow confidence interval indicates that the index series is estimated precisely, and a wider one that it is less precise, though the scale of the *y*-axis must be taken into account. 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 statistically significant difference at approximately the 5% level (Anganuzzi 1993).

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. 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. Where the confidence interval does not include zero, population declines are regarded as statistically significant. The 'Alert' column indicates where a statistically significant population decline is estimated to be of greater than 50% (>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. Population trends by habitat: This chart shows the species' BBS trends for the 16-year period 1995–2011 for each of 12 broad, mutually exclusive habitat types. The data presented vary by species according to their sample sizes. The vertical axis shows the estimated percentage change over the period, with its 95% confidence interval, in relation to the overall change, indicated by a dashed line. Under 'More on habitat trends', the data for each habitat trend are presented as a table and as a graph.The graphs allow the patterns of change to be compared between habitat categories over time. There is more information on these trends here on the BBS pages.

9. Demography graphs: Graphs from Constant Effort Sites or Nest Record Scheme data illustrate trends in productivity and survival. NRS graphs show annual means, with error bars to denote ±1 standard error; and quadratic or linear regression lines with their 95% confidence interval. For CES data, the smoothed trends are plotted with their 85% confidence limits (see CES section for details). CES survival graphs show annual estimates, ±1 standard error, but trends for these data have not been assessed.

10. 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).

11. Causes of change: For a selection of species (currently 54), information on the causes of the demographic changes we have observed has been removed from the Status summary paragraph and expanded under this heading.

12. 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 – 25 years
3. CES adults alerts – 10 years
4. CES adults alerts – 5 years
5. 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

WBS/WBBS alerts & population increases

1. Table of alerts for WBS/WBBS waterways 1975-2012

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Yellow Wagtail	37	24	-96	-99	-93	>50	
Snipe	37	13	-92	-98	-76	>50	Small sample
Pied Wagtail	37	113	-65	-73	-55	>50	
Redshank	37	24	-64	-88	-40	>50	
Reed Bunting	37	86	-62	-73	-46	>50	
Grey Wagtail	37	96	-60	-67	-48	>50	
Little Grebe	37	20	-53	-78	-9	>50	
Common Sandpiper	37	48	-48	-63	-35	>25	
Sedge Warbler	37	71	-47	-64	-22	>25	
Moorhen	37	123	-33	-49	-11	>25	
Dipper	37	64	-32	-50	-4	>25	

2. Table of alerts for WBS/WBBS waterways 1987-2012

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Yellow Wagtail	25	22	-93	-97	-89	>50	
Snipe	25	15	-89	-97	-79	>50	Small sample
Lapwing	25	77	-69	-81	-55	>50	
Redshank	25	26	-62	-77	-42	>50	
Common Sandpiper	25	58	-51	-61	-42	>50	
Sedge Warbler	25	89	-37	-49	-18	>25	
Pied Wagtail	25	135	-34	-47	-13	>25	
Grey Wagtail	25	117	-33	-43	-19	>25	
Dipper	25	78	-27	-42	-2	>25	

3. Table of alerts for WBS/WBBS waterways 2002-2012

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Yellow Wagtail	10	22	-54	-73	-25	>50	
Lapwing	10	108	-50	-59	-42	>50	
Snipe	10	23	-48	-70	-14	>25	
Grey Wagtail	10	164	-47	-53	-38	>25	
Redshank	10	30	-40	-52	-11	>25	
Curlew	10	76	-32	-44	-21	>25	
Sedge Warbler	10	116	-32	-41	-23	>25	

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Common Sandpiper	10	82	-26	-38	-14	>25	

4. Table of alerts for WBS/WBBS waterways 2007-2012

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Grey Wagtail	5	135	-45	-52	-36	>25	
Lapwing	5	93	-34	-48	-22	>25	
Yellow Wagtail	5	17	-29	-52	-2	>25	Small sample

5. Table of population increases for WBS/WBBS waterways 1975-2012

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Oystercatcher	37	48	57	21	152		
Coot	37	61	72	12	206		
Mute Swan	37	80	79	18	141		
Whitethroat	37	82	160	1	400		
Mallard	37	166	205	135	288		

CBC/BBS alerts & population increases

1a. Table of population alerts for CBC/BBS UK 1967-2012

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Turtle Dove	45	105	-95	-97	-93	>50	
Willow Tit	45	43	-92	-97	-85	>50	
Grey Partridge	45	135	-91	-94	-87	>50	
Spotted Flycatcher	45	129	-89	-94	-85	>50	
Corn Bunting	45	75	-88	-94	-79	>50	
Marsh Tit	45	100	-74	-82	-65	>50	
Yellow Wagtail	45	82	-73	-89	-39	>50	
Little Owl	45	60	-68	-82	-50	>50	
Mistle Thrush	45	568	-61	-68	-53	>50	
Song Thrush	45	931	-58	-64	-51	>50	
Whitethroat	45	622	-57	-69	-42	>50	
Lapwing	45	310	-56	-76	-31	>50	
Yellowhammer	45	568	-56	-64	-43	>50	
Bullfinch	45	340	-40	-51	-26	>25	
Dunnock	45	963	-34	-43	-22	>25	
Reed Bunting	45	258	-29	-49	-9	>25	
Greenfinch	45	816	-26	-42	-8	>25	

1b. Table of population alerts for CBC/BBS England 1967-2012

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Turtle Dove	45	104	-95	-97	-93	>50	
Tree Sparrow	45	96	-95	-98	-91	>50	
Spotted Flycatcher	45	97	-93	-95	-89	>50	
Willow Tit	45	40	-92	-96	-86	>50	
Grey Partridge	45	121	-91	-94	-86	>50	
Starling	45	648	-89	-92	-85	>50	
Tree Pipit	45	50	-86	-93	-72	>50	
Corn Bunting	45	72	-86	-93	-76	>50	
Lesser Redpoll	45	49	-82	-93	-60	>50	
Cuckoo	45	296	-76	-83	-66	>50	
Marsh Tit	45	92	-74	-81	-64	>50	
Linnet	45	467	-72	-79	-65	>50	
Yellow Wagtail	45	81	-71	-86	-44	>50	

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
House Martin	45	304	-69	-88	-7	>50	
Skylark	45	628	-63	-70	-56	>50	
Mistle Thrush	45	461	-63	-69	-56	>50	
Little Owl	45	58	-62	-77	-37	>50	
Willow Warbler	45	492	-60	-72	-45	>50	
Yellowhammer	45	496	-60	-68	-49	>50	
Whitethroat	45	538	-57	-68	-42	>50	
Song Thrush	45	741	-56	-63	-49	>50	
Meadow Pipit	45	199	-47	-74	-18	>25	
Bullfinch	45	274	-41	-55	-26	>25	
Dunnock	45	795	-38	-46	-28	>25	
Lapwing	45	260	-37	-65	-5	>25	

2a. Table of population alerts for CBC/BBS UK 1987-2012

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Turtle Dove	25	132	-92	-95	-89	>50	
Willow Tit	25	47	-91	-95	-85	>50	
Spotted Flycatcher	25	165	-80	-86	-75	>50	
Grey Partridge	25	186	-76	-82	-69	>50	
Little Owl	25	86	-65	-76	-52	>50	
Yellow Wagtail	25	123	-63	-76	-49	>50	
Corn Bunting	25	111	-61	-78	-38	>50	
Lapwing	25	509	-57	-66	-44	>50	
Yellowhammer	25	905	-49	-55	-42	>25	
Mistle Thrush	25	901	-45	-52	-37	>25	
Marsh Tit	25	134	-42	-54	-25	>25	
Tawny Owl	25	98	-31	-45	-13	>25	

2b. Table of population alerts for CBC/BBS England 1987-2012

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Turtle Dove	25	130	-92	-95	-90	>50	
Willow Tit	25	42	-91	-94	-86	>50	
Spotted Flycatcher	25	119	-86	-89	-80	>50	
Tree Pipit	25	62	-85	-92	-78	>50	
Lesser Redpoll	25	52	-85	-93	-73	>50	
Starling	25	1073	-79	-83	-75	>50	
Grey Partridge	25	167	-74	-79	-67	>50	
Cuckoo	25	454	-73	-78	-69	>50	
Yellow Wagtail	25	120	-61	-74	-48	>50	
Little Owl	25	83	-60	-70	-45	>50	
Corn Bunting	25	107	-59	-77	-35	>50	
Willow Warbler	25	752	-58	-66	-52	>50	
Yellowhammer	25	790	-56	-61	-50	>50	
Tree Sparrow	25	111	-55	-77	-15	>50	

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Mistle Thrush	25	724	-51	-56	-43	>50	
Lapwing	25	426	-45	-58	-28	>25	
Marsh Tit	25	122	-42	-53	-26	>25	
House Sparrow	25	966	-41	-56	-22	>25	
Skylark	25	1039	-33	-39	-23	>25	
Garden Warbler	25	306	-33	-44	-18	>25	
Tawny Owl	25	84	-31	-46	-11	>25	
Meadow Pipit	25	328	-27	-43	-4	>25	

3a. Table of population alerts for CBC/BBS UK 2002-2012

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Turtle Dove	10	126	-80	-84	-75	>50	
Willow Tit	10	44	-62	-72	-52	>50	
Little Owl	10	102	-54	-64	-40	>50	
Greenfinch	10	2075	-40	-43	-37	>25	
Mistle Thrush	10	1283	-39	-43	-35	>25	
Lapwing	10	763	-37	-42	-31	>25	
Grey Partridge	10	231	-36	-45	-25	>25	
Marsh Tit	10	163	-33	-44	-22	>25	
Spotted Flycatcher	10	186	-31	-48	-12	>25	
Moorhen	10	723	-28	-33	-23	>25	

3b. Table of population alerts for CBC/BBS England 2002-2012

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Turtle Dove	10	124	-80	-84	-76	>50	
Willow Tit	10	39	-63	-73	-54	>50	
Little Owl	10	100	-53	-62	-39	>50	
Spotted Flycatcher	10	130	-51	-59	-43	>50	
Cuckoo	10	531	-46	-49	-42	>25	
Starling	10	1543	-45	-49	-42	>25	
Mistle Thrush	10	1013	-40	-44	-37	>25	
Greenfinch	10	1745	-39	-42	-37	>25	
Marsh Tit	10	148	-31	-41	-17	>25	
Lapwing	10	651	-30	-36	-23	>25	
Pied Wagtail	10	1084	-30	-34	-26	>25	
Grey Partridge	10	210	-29	-37	-15	>25	
Tree Pipit	10	78	-28	-43	-9	>25	
Moorhen	10	672	-27	-32	-22	>25	
House Martin	10	813	-27	-33	-19	>25	

4a. Table of population alerts for CBC/BBS UK 2007-2012

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Turtle Dove	5	99	-65	-71	-59	>50	
Willow Tit	5	42	-42	-56	-31	>25	
Lapwing	5	818	-37	-44	-29	>25	
Little Owl	5	102	-37	-47	-27	>25	
Greenfinch	5	2232	-37	-39	-35	>25	
Moorhen	5	774	-28	-32	-24	>25	
Mistle Thrush	5	1342	-26	-30	-22	>25	

4b. Table of population alerts for CBC/BBS England 2007-2012

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Turtle Dove	5	97	-65	-71	-60	>50	
Willow Tit	5	38	-52	-66	-38	>50	
Little Owl	5	100	-40	-47	-29	>25	
Greenfinch	5	1888	-36	-38	-34	>25	
Spotted Flycatcher	5	124	-32	-42	-22	>25	
Starling	5	1647	-31	-36	-28	>25	
Lapwing	5	705	-30	-34	-25	>25	
Cuckoo	5	530	-27	-31	-23	>25	
Moorhen	5	724	-26	-31	-22	>25	
Mistle Thrush	5	1063	-25	-28	-22	>25	

5a. Table of population increases of >50% for UK CBC/BBS 1967-2012

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Wren	45	1127	55	35	71		
Coal Tit	45	403	65	6	177		
Chiffchaff	45	682	85	49	133		
Reed Warbler	45	68	94	37	281		
Magpie	45	861	100	65	150		
Great Tit	45	1016	107	80	134		
Jackdaw	45	728	126	46	263		
Mallard	45	596	163	102	220		
Coot	45	128	173	73	447		
Woodpigeon	45	1054	173	51	519		
Nuthatch	45	239	252	151	396		
Mute Swan	45	114	254	57	666		
Blackcap	45	736	280	219	370		
Great Spotted Woodpecker	45	488	399	280	690		

5b. Table of population increases of >50% for England CBC/BBS 1967-2012

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Wren	45	897	61	38	83		
Reed Warbler	45	65	73	19	210		
Pheasant	45	687	88	51	171		
Chiffchaff	45	581	88	55	145		
Great Tit	45	835	94	69	123		
Goldfinch	45	585	96	44	148		
Long-tailed Tit	45	420	98	45	183		
Magpie	45	729	107	68	165		
Jackdaw	45	586	118	43	262		
Carrion Crow	45	874	132	84	193		Includes Hooded Crow
Coot	45	116	161	67	513		
Stock Dove	45	337	186	90	353		
Woodpigeon	45	848	191	43	569		
Green Woodpecker	45	355	198	134	332		
Mallard	45	503	202	136	262		
Mute Swan	45	97	220	66	554		
Blackcap	45	637	242	180	329		
Nuthatch	45	206	260	174	427		
Great Spotted Woodpecker	45	432	352	224	616		
Buzzard	45	260	735	444	1822		

CES alerts & population increases

1. CES adults alerts – long term
2. CES adults alerts – 25 years
3. CES adults alerts – 10 years
4. CES adults alerts – 5 years
5. CES adults population increases of >50% – long term

1. Table of alerts for CES adults 1984-2012

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Lesser Whitethroat	28	38	-68	-82	-54	>50	
Willow Warbler	28	89	-68	-75	-61	>50	
Willow Tit	28	18	-67	-90	-35	>50	Small sample
Reed Bunting	28	59	-64	-73	-49	>50	
Sedge Warbler	28	66	-42	-56	-20	>25	
Reed Warbler	28	56	-31	-46	-10	>25	
Song Thrush	28	82	-30	-43	-13	>25	

2. Table of alerts for CES adults 1987-2012

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Lesser Whitethroat	25	39	-74	-84	-65	>50	
Willow Tit	25	18	-72	-92	-45	>50	Small sample
Willow Warbler	25	95	-65	-72	-58	>50	
Reed Bunting	25	63	-59	-70	-43	>50	
Sedge Warbler	25	71	-56	-66	-45	>50	

3. Table of alerts for CES adults 2002-2012

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Greenfinch	10	47	-44	-58	-30	>25	
Sedge Warbler	10	71	-38	-45	-30	>25	
Lesser Whitethroat	10	34	-37	-54	-19	>25	
Reed Bunting	10	64	-28	-43	-12	>25	

4. Table of alerts for CES adults 2007-2012

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Greenfinch	5	43	-36	-49	-21	>25	
Robin	5	100	-29	-33	-24	>25	
Chaffinch	5	78	-25	-34	-17	>25	

5. Table of population increases for CES adults 1984-2012

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Blackcap	28	91	110	75	162		
Chiffchaff	28	74	245	121	479		

BBS population declines & increases

1. Table of declines >25% for BBS UK 1995-2012

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Turtle Dove	17	153	-88	-90	-85	>50	
Willow Tit	17	49	-83	-88	-78	>50	
Wood Warbler	17	52	-66	-78	-49	>50	
Grey Partridge	17	231	-56	-62	-47	>50	
Whinchat	17	76	-55	-67	-43	>50	
Pied Flycatcher	17	40	-53	-67	-37	>50	
Starling	17	1771	-51	-56	-47	>50	
Little Owl	17	100	-50	-59	-38	>50	
Cuckoo	17	718	-49	-54	-44	>25	
Spotted Flycatcher	17	194	-49	-62	-39	>25	
Redshank	17	86	-44	-59	-20	>25	
Curlew	17	522	-43	-48	-35	>25	
Yellow Wagtail	17	158	-43	-51	-32	>25	
Lapwing	17	689	-42	-50	-35	>25	
Corn Bunting	17	143	-39	-50	-25	>25	
Swift	17	1046	-38	-46	-30	>25	
Kingfisher	17	54	-36	-53	-14	>25	
Kestrel	17	678	-35	-39	-28	>25	
Mistle Thrush	17	1181	-34	-39	-29	>25	
Grey Wagtail	17	219	-32	-44	-20	>25	
Marsh Tit	17	150	-29	-41	-15	>25	
Tawny Owl	17	94	-25	-40	-7	>25	Nocturnal species

2. Table of declines >25% for BBS England 1995-2012

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Turtle Dove	17	150	-88	-90	-85	>50	
Willow Tit	17	44	-83	-89	-78	>50	

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Cuckoo	17	567	-68	-71	-65	>50	
Spotted Flycatcher	17	137	-63	-71	-54	>50	
Starling	17	1449	-59	-63	-57	>50	
Grey Partridge	17	207	-52	-59	-43	>50	
Little Owl	17	97	-50	-59	-39	>25	
Tree Pipit	17	75	-48	-63	-26	>25	
Yellow Wagtail	17	155	-43	-52	-33	>25	
Mistle Thrush	17	940	-42	-46	-38	>25	
Nightingale	17	32	-41	-58	-9	>25	
Whinchat	17	33	-41	-63	-19	>25	
Grasshopper Warbler	17	40	-37	-48	-6	>25	
Swift	17	903	-36	-47	-27	>25	
Corn Bunting	17	137	-35	-48	-22	>25	
Willow Warbler	17	945	-34	-38	-29	>25	
Kingfisher	17	48	-33	-50	-10	>25	
Marsh Tit	17	135	-31	-43	-17	>25	
Curlew	17	338	-30	-37	-23	>25	
Redshank	17	61	-28	-44	-7	>25	
Garden Warbler	17	369	-28	-35	-19	>25	
House Martin	17	742	-27	-34	-16	>25	
Feral Pigeon/Rock Dove	17	571	-26	-35	-13	>25	
Tawny Owl	17	80	-26	-42	-6	>25	Nocturnal species
Skylark	17	1401	-25	-29	-21	>25	

3. Table of declines >25% for BBS Scotland 1995-2012

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Kestrel	17	42	-65	-75	-50	>50	
Swift	17	53	-62	-70	-48	>50	
Lapwing	17	89	-57	-65	-47	>50	
Curlew	17	126	-55	-62	-46	>50	
Grey Wagtail	17	32	-41	-60	-8	>25	
Rook	17	115	-35	-47	-14	>25	
Starling	17	151	-33	-47	-21	>25	
Greenfinch	17	109	-32	-46	-16	>25	
Linnet	17	92	-29	-41	-5	>25	
Skylark	17	212	-27	-36	-14	>25	
Oystercatcher	17	133	-26	-36	-18	>25	
Meadow Pipit	17	211	-25	-34	-15	>25	

4. Table of declines >25% for BBS Wales 1995-2012

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Starling	17	80	-70	-78	-61	>50	
Yellowhammer	17	34	-59	-68	-43	>50	
Curlew	17	35	-56	-71	-37	>50	

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Goldcrest	17	82	-52	-64	-28	>50	
Cuckoo	17	57	-43	-63	-25	>25	
Swift	17	66	-43	-58	-10	>25	
Green Woodpecker	17	47	-38	-56	-15	>25	
Magpie	17	162	-33	-51	-6	>25	
Linnet	17	93	-28	-45	-4	>25	

5. Table of declines >25% for BBS Northern Ireland 1995-2012

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Skylark	17	33	-54	-62	-48	>50	
Meadow Pipit	17	64	-29	-44	-9	>25	

6. Table of declines >25% for BBS UK 2002-2012

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Turtle Dove	10	126	-80	-85	-76	>50	
Willow Tit	10	44	-62	-72	-52	>50	
Grey Wagtail	10	253	-56	-61	-49	>50	
Stonechat	10	199	-56	-63	-47	>50	
Little Owl	10	102	-53	-63	-42	>50	
Kingfisher	10	61	-48	-63	-30	>25	
Starling	10	1896	-42	-47	-38	>25	
Greenfinch	10	2075	-40	-42	-37	>25	
Mistle Thrush	10	1283	-38	-41	-34	>25	
Grey Partridge	10	231	-35	-43	-25	>25	
Lapwing	10	763	-35	-42	-28	>25	
Goldcrest	10	905	-34	-40	-24	>25	
Marsh Tit	10	163	-34	-43	-23	>25	
Whinchat	10	71	-33	-46	-16	>25	
Redshank	10	94	-31	-44	-14	>25	
Grey Heron	10	763	-30	-36	-22	>25	Non-breeders included
Spotted Flycatcher	10	186	-30	-48	-14	>25	
Moorhen	10	723	-28	-33	-23	>25	
Cuckoo	10	685	-28	-36	-22	>25	
Kestrel	10	761	-27	-31	-19	>25	
Curlew	10	560	-27	-35	-18	>25	

7. Table of declines >25% for BBS England 2002-2012

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Turtle Dove	10	124	-80	-84	-76	>50	
Willow Tit	10	39	-64	-72	-54	>50	

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Stonechat	10	95	-59	-70	-47	>50	
Little Owl	10	100	-52	-63	-39	>50	
Spotted Flycatcher	10	130	-51	-61	-40	>50	
Cuckoo	10	531	-46	-50	-42	>25	
Starling	10	1543	-45	-49	-41	>25	
Grey Wagtail	10	174	-44	-51	-34	>25	
Mistle Thrush	10	1013	-40	-43	-37	>25	
Kingfisher	10	54	-39	-53	-22	>25	
Greenfinch	10	1745	-39	-42	-37	>25	
Redshank	10	69	-35	-49	-21	>25	
Marsh Tit	10	148	-31	-43	-15	>25	
Pied Wagtail	10	1084	-30	-34	-26	>25	
Grey Partridge	10	210	-29	-38	-16	>25	
Lapwing	10	651	-29	-35	-24	>25	
Snipe	10	110	-29	-42	-16	>25	
Grey Heron	10	632	-28	-34	-22	>25	Non-breeders included
House Martin	10	813	-28	-34	-20	>25	
Tree Pipit	10	78	-28	-44	-12	>25	
Moorhen	10	672	-27	-31	-22	>25	
Feral Pigeon/Rock Dove	10	620	-27	-36	-18	>25	
Whinchat	10	34	-27	-45	-11	>25	

8. Table of declines >25% for BBS Scotland 2002-2012

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Grey Wagtail	10	35	-69	-79	-53	>50	
Stonechat	10	45	-59	-71	-41	>50	
Kestrel	10	44	-54	-68	-32	>50	
Goldcrest	10	104	-52	-64	-38	>50	
Mistle Thrush	10	86	-47	-59	-32	>25	
Rook	10	122	-42	-54	-22	>25	
Lapwing	10	89	-41	-51	-30	>25	
Linnet	10	98	-37	-50	-13	>25	
Grey Heron	10	57	-36	-51	-15	>25	Non-breeders included
Swift	10	59	-36	-49	-15	>25	
Starling	10	165	-36	-51	-23	>25	
Curlew	10	124	-35	-49	-24	>25	
Wren	10	247	-33	-38	-24	>25	
Greenfinch	10	122	-33	-45	-20	>25	
Song Thrush	10	198	-30	-39	-19	>25	
Snipe	10	60	-26	-37	-13	>25	
Skylark	10	220	-26	-33	-18	>25	

9. Table of declines >25% for BBS Wales 2002-2012

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

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Greenfinch	10	131	-53	-62	-40	>50	
Starling	10	80	-47	-58	-37	>25	
Yellowhammer	10	32	-44	-55	-26	>25	
Goldcrest	10	89	-42	-54	-26	>25	
Linnet	10	101	-39	-50	-24	>25	
Stonechat	10	45	-37	-50	-11	>25	
Curlew	10	33	-36	-54	-16	>25	
Grey Heron	10	47	-35	-48	-20	>25	Non-breeders included
Swift	10	71	-34	-48	-10	>25	
Green Woodpecker	10	51	-33	-59	-7	>25	
Wren	10	221	-28	-33	-19	>25	
Robin	10	217	-26	-31	-20	>25	

10. Table of declines >25% for BBS Northern Ireland 2002-2012

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Skylark	10	34	-57	-67	-52	>50	
Greenfinch	10	62	-57	-67	-48	>50	
Meadow Pipit	10	72	-51	-58	-46	>50	
Mistle Thrush	10	70	-41	-52	-29	>25	
Rook	10	88	-40	-56	-23	>25	
Starling	10	95	-38	-49	-21	>25	
Goldcrest	10	52	-35	-45	-15	>25	
Wren	10	108	-32	-38	-22	>25	
Song Thrush	10	92	-27	-36	-15	>25	

11. Table of declines >25% for BBS UK 2007-2012

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Turtle Dove	5	99	-65	-72	-60	>50	
Stonechat	5	219	-62	-70	-57	>50	
Grey Wagtail	5	265	-49	-55	-42	>25	
Willow Tit	5	42	-42	-56	-32	>25	
Kingfisher	5	59	-38	-48	-28	>25	
Little Owl	5	102	-36	-46	-25	>25	
Greenfinch	5	2232	-36	-39	-34	>25	
Lapwing	5	818	-35	-42	-26	>25	
Common Tern	5	86	-31	-49	-9	>25	Non-breeders included
Kestrel	5	838	-27	-29	-21	>25	
Moorhen	5	774	-27	-31	-23	>25	
Redshank	5	102	-26	-39	-11	>25	
Starling	5	2015	-26	-32	-21	>25	
Mistle Thrush	5	1342	-25	-29	-21	>25	

12. Table of declines >25% for BBS England 2007-2012

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Turtle Dove	5	97	-65	-71	-60	>50	
Stonechat	5	114	-58	-69	-51	>50	
Willow Tit	5	38	-51	-64	-37	>50	
Kingfisher	5	55	-40	-50	-28	>25	
Little Owl	5	100	-39	-46	-27	>25	
Grey Wagtail	5	188	-35	-43	-25	>25	
Greenfinch	5	1888	-35	-38	-34	>25	
Spotted Flycatcher	5	124	-32	-42	-22	>25	
Starling	5	1647	-31	-35	-27	>25	
Canada Goose	5	602	-30	-45	-5	>25	
Lapwing	5	705	-30	-34	-25	>25	
Cuckoo	5	530	-27	-32	-22	>25	
Moorhen	5	724	-26	-30	-22	>25	

13. Table of declines >25% for BBS Scotland 2007-2012

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Stonechat	5	51	-71	-80	-62	>50	
Grey Wagtail	5	38	-59	-73	-41	>50	
Kestrel	5	44	-49	-62	-32	>25	
Swift	5	64	-46	-53	-31	>25	
Lapwing	5	93	-42	-52	-28	>25	
Wren	5	280	-40	-45	-34	>25	
Greenfinch	5	137	-38	-46	-30	>25	
Linnet	5	106	-37	-46	-21	>25	
Reed Bunting	5	84	-37	-53	-15	>25	
Goldcrest	5	118	-35	-51	-26	>25	
Mistle Thrush	5	98	-34	-47	-21	>25	
Skylark	5	247	-30	-36	-22	>25	
Snipe	5	67	-29	-40	-8	>25	
Song Thrush	5	228	-26	-33	-19	>25	

14. Table of declines >25% for BBS Wales 2007-2012

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Stonechat	5	42	-45	-53	-28	>25	
Greenfinch	5	128	-44	-54	-34	>25	
Starling	5	74	-34	-47	-22	>25	
Green Woodpecker	5	51	-29	-43	-15	>25	

15. Table of declines >25% for BBS Northern Ireland 2007-2012

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Greenfinch	5	61	-48	-59	-42	>25	
Meadow Pipit	5	71	-44	-52	-36	>25	
Goldcrest	5	57	-43	-55	-36	>25	
Linnet	5	49	-39	-51	-20	>25	
Skylark	5	32	-35	-44	-25	>25	
Wren	5	112	-33	-37	-26	>25	
Mistle Thrush	5	69	-30	-41	-19	>25	
Song Thrush	5	97	-28	-35	-21	>25	

16. Table of population increases for BBS UK 1995-2012

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Jackdaw	17	1728	53	43	67		
Canada Goose	17	486	54	27	98		
Crossbill	17	60	74	34	166		
Siskin	17	176	77	36	111		
Buzzard	17	968	79	64	98		
Chiffchaff	17	1506	88	81	100		
Nuthatch	17	493	91	74	111		
Gadwall	17	38	107	33	217		
Goldfinch	17	1627	112	99	125		
Tree Sparrow	17	178	128	82	181		
Blackcap	17	1597	137	126	154		
Great Spotted Woodpecker	17	1077	139	125	153		
Greylag Goose	17	200	203	37	481		
Barn Owl	17	47	277	153	494		
Red Kite	17	99	805	461	1524		
Ring-necked Parakeet	17	63	1060	399	3506		
Little Egret	17	32	1666	.	.		

17. Table of population increases for BBS England 1995-2012

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Oystercatcher	17	185	57	37	80		
Jackdaw	17	1386	61	51	72		
Tree Sparrow	17	142	81	47	129		
Chiffchaff	17	1271	86	78	97		
Nuthatch	17	419	92	72	113		
Siskin	17	64	101	10	278		
Goldfinch	17	1341	104	89	115		
Gadwall	17	36	107	36	231		
Blackcap	17	1369	113	102	124		
Great Spotted Woodpecker	17	946	116	105	130		

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Buzzard	17	648	175	139	215		
Barn Owl	17	44	273	164	406		
Greylag Goose	17	166	278	168	534		
Ring-necked Parakeet	17	63	1061	383	3575		
Little Egret	17	30	1636	.	.		
Red Kite	17	71	12792	5390	12532		

18. Table of population increases for BBS Scotland 1995-2012

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Great Tit	17	154	56	35	80		
Dunnock	17	143	61	35	90		
Siskin	17	75	65	20	116		
Tree Pipit	17	32	86	29	153		
Whitethroat	17	84	93	43	150		
House Martin	17	67	125	40	216		
Goldfinch	17	96	160	91	255		
Great Spotted Woodpecker	17	50	369	253	507		
Blackcap	17	60	372	237	599		
Chiffchaff	17	50	457	267	773		

19. Table of population increases for BBS Wales 1995-2012

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Stonechat	17	36	59	6	161		
Chiffchaff	17	140	59	34	86		
Stock Dove	17	31	75	15	209		
Goldfinch	17	130	80	46	120		
House Sparrow	17	125	96	66	131		
Blackcap	17	124	124	92	190		
Great Spotted Woodpecker	17	79	193	119	275		

20. Table of population increases for BBS Northern Ireland 1995-2012

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Chaffinch	17	91	51	18	67		
Dunnock	17	70	63	11	102		
Coal Tit	17	64	80	25	132		
Lesser Redpoll	17	31	80	.	.		
House Martin	17	43	82	16	186		
Woodpigeon	17	85	88	48	136		
Willow Warbler	17	81	92	42	126		
Jackdaw	17	77	108	46	158		
Collared Dove	17	32	110	19	180		

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
Pheasant	17	42	124	28	201		
Hooded Crow	17	82	138	78	196		
Great Tit	17	73	163	93	200		
Goldfinch	17	49	814	.	.		
Buzzard	17	32	854399	.	.		
Blackcap	17	38	2572352	.	.		

Breeding performance

1. Table of significant trends in Clutch size measured between 1968-2012

Species	Period (yrs)	Mean annual sample	Trend	Predicted in first year	Predicted in last year	Change	Comment
Magpie	44	43	Linear decline	5.75 eggs	4.86 eggs	-0.89 eggs	
Long-tailed Tit	44	42	Curvilinear	7.77 eggs	7.06 eggs	-0.71 eggs	
Great Tit	44	352	Linear decline	8.08 eggs	7.43 eggs	-0.65 eggs	
Grey Heron	44	15	Linear decline	4.03 eggs	3.42 eggs	-0.61 eggs	Small sample
Peregrine	44	18	Linear decline	3.49 eggs	3.13 eggs	-0.36 eggs	Small sample
Meadow Pipit	44	39	Curvilinear	4.26 eggs	4.02 eggs	-0.24 eggs	
Greenfinch	44	88	Linear decline	4.76 eggs	4.57 eggs	-0.19 eggs	
Pied Wagtail	44	66	Linear decline	5.09 eggs	4.92 eggs	-0.17 eggs	
Golden Plover	44	12	Linear decline	3.97 eggs	3.84 eggs	-0.13 eggs	Small sample
Linnet	44	124	Linear decline	4.74 eggs	4.61 eggs	-0.13 eggs	
Reed Bunting	44	44	Linear decline	4.5 eggs	4.37 eggs	-0.13 eggs	
Buzzard	44	35	Curvilinear	2.17 eggs	2.05 eggs	-0.12 eggs	
Common Sandpiper	44	12	Curvilinear	3.98 eggs	3.87 eggs	-0.11 eggs	Small sample
Nightjar	44	19	Linear decline	1.98 eggs	1.87 eggs	-0.11 eggs	Small sample
Collared Dove	44	44	Linear decline	1.95 eggs	1.88 eggs	-0.07 eggs	
Grey Wagtail	44	38	Curvilinear	4.75 eggs	4.69 eggs	-0.06 eggs	
Blackbird	44	206	Curvilinear	3.77 eggs	3.76 eggs	-0.01 eggs	
Swallow	44	488	Curvilinear	4.48 eggs	4.48 eggs	0 eggs	
Dipper	44	82	Curvilinear	4.5 eggs	4.51 eggs	0.01 eggs	
Stock Dove	44	121	Curvilinear	2.06 eggs	2.1 eggs	0.04 eggs	
Lapwing	44	192	Linear increase	3.71 eggs	3.81 eggs	0.1 eggs	
Carrion Crow	44	32	Curvilinear	4.05 eggs	4.15 eggs	0.1 eggs	Includes Hooded Crow
Stonechat	44	35	Curvilinear	4.98 eggs	5.12 eggs	0.14 eggs	
Dunnock	44	112	Linear increase	3.97 eggs	4.15 eggs	0.18 eggs	
Little Owl	44	23	Linear increase	3.38 eggs	3.65 eggs	0.27 eggs	Small sample
Pied Flycatcher	44	361	Linear increase	6.58 eggs	6.86 eggs	0.28 eggs	
Skylark	44	35	Linear increase	3.38 eggs	3.69 eggs	0.31 eggs	
Redstart	44	52	Curvilinear	5.92 eggs	6.23 eggs	0.31 eggs	
Tree Sparrow	44	291	Curvilinear	4.76 eggs	5.15 eggs	0.39 eggs	
Starling	44	76	Linear increase	4.44 eggs	4.95 eggs	0.51 eggs	
Barn Owl	44	45	Curvilinear	4.28 eggs	4.83 eggs	0.55 eggs	

2. Table of significant trends in Brood size measured between 1968-2012

Species	Period (yrs)	Mean annual sample	Trend	Predicted in first year	Predicted in last year	Change	Comment
Sand Martin	44	64	Linear decline	4.37 chicks	2.92 chicks	-1.45 chicks	
Great Tit	44	736	Linear decline	7.29 chicks	6.22 chicks	-1.07 chicks	
Blue Tit	44	856	Linear decline	8.17 chicks	7.31 chicks	-0.86 chicks	
Magpie	44	81	Curvilinear	3.25 chicks	2.7 chicks	-0.55 chicks	
Coal Tit	44	74	Curvilinear	7.32 chicks	6.8 chicks	-0.52 chicks	
Long-tailed Tit	44	33	Linear decline	6.38 chicks	5.86 chicks	-0.52 chicks	
Carrion Crow	44	79	Curvilinear	2.92 chicks	2.46 chicks	-0.46 chicks	Includes Hooded Crow
House Sparrow	44	160	Curvilinear	3.35 chicks	2.89 chicks	-0.46 chicks	
Grey Heron	44	89	Curvilinear	2.73 chicks	2.29 chicks	-0.44 chicks	
Yellow Wagtail	44	12	Linear decline	4.8 chicks	4.37 chicks	-0.43 chicks	Small sample
Chiffchaff	44	45	Linear decline	5.1 chicks	4.69 chicks	-0.41 chicks	

Species	Period (yrs)	Mean annual sample	Trend	Predicted in first year	Predicted in last year	Change	Comment
Greenfinch	44	109	Linear decline	4.1 chicks	3.76 chicks	-0.34 chicks	
Rook	44	78	Curvilinear	2.21 chicks	1.95 chicks	-0.26 chicks	
Bullfinch	44	37	Linear decline	4.17 chicks	3.91 chicks	-0.26 chicks	
Raven	44	70	Linear decline	3.14 chicks	2.92 chicks	-0.22 chicks	
Hobby	44	25	Linear decline	2.51 chicks	2.31 chicks	-0.2 chicks	Small sample
Meadow Pipit	44	77	Linear decline	4.01 chicks	3.81 chicks	-0.2 chicks	
Pied Wagtail	44	136	Linear decline	4.5 chicks	4.35 chicks	-0.15 chicks	
Turtle Dove	44	15	Curvilinear	1.82 chicks	1.7 chicks	-0.12 chicks	Small sample
Barn Owl	44	368	Curvilinear	3 chicks	2.88 chicks	-0.12 chicks	
Reed Bunting	44	61	Curvilinear	4.02 chicks	3.92 chicks	-0.1 chicks	
Robin	44	231	Curvilinear	4.41 chicks	4.32 chicks	-0.09 chicks	
Woodpigeon	44	124	Linear decline	1.84 chicks	1.78 chicks	-0.06 chicks	
Blackbird	44	269	Curvilinear	3.35 chicks	3.29 chicks	-0.06 chicks	
Chaffinch	44	160	Curvilinear	3.6 chicks	3.54 chicks	-0.06 chicks	
Linnet	44	142	Curvilinear	4.1 chicks	4.07 chicks	-0.03 chicks	
Yellowhammer	44	66	Curvilinear	2.98 chicks	2.99 chicks	0.01 chicks	
Dunnock	44	124	Curvilinear	3.4 chicks	3.42 chicks	0.02 chicks	
Spotted Flycatcher	44	127	Curvilinear	3.63 chicks	3.66 chicks	0.03 chicks	
Swallow	44	845	Curvilinear	4.11 chicks	4.15 chicks	0.04 chicks	
Mute Swan	44	67	Curvilinear	4.42 chicks	4.47 chicks	0.05 chicks	
Buzzard	44	110	Curvilinear	1.89 chicks	1.96 chicks	0.07 chicks	
Kestrel	44	150	Curvilinear	3.78 chicks	3.86 chicks	0.08 chicks	
Grey Wagtail	44	80	Curvilinear	4.03 chicks	4.11 chicks	0.08 chicks	
Stonechat	44	69	Curvilinear	4.64 chicks	4.72 chicks	0.08 chicks	
Tree Pipit	44	30	Curvilinear	4.3 chicks	4.47 chicks	0.17 chicks	Small sample
Sparrowhawk	44	68	Curvilinear	3.15 chicks	3.35 chicks	0.2 chicks	
Skylark	44	65	Curvilinear	3.12 chicks	3.34 chicks	0.22 chicks	
Peregrine	44	48	Linear increase	2.37 chicks	2.6 chicks	0.23 chicks	
Willow Warbler	44	150	Linear increase	5.13 chicks	5.38 chicks	0.25 chicks	
Starling	44	237	Linear increase	3.3 chicks	3.58 chicks	0.28 chicks	
Merlin	44	55	Linear increase	3.53 chicks	3.82 chicks	0.29 chicks	
Dipper	44	152	Curvilinear	3.44 chicks	3.74 chicks	0.3 chicks	
Corn Bunting	44	15	Curvilinear	3.34 chicks	3.64 chicks	0.3 chicks	Small sample
Little Owl	44	48	Linear increase	2.53 chicks	2.86 chicks	0.33 chicks	
Tree Sparrow	44	387	Curvilinear	3.78 chicks	4.11 chicks	0.33 chicks	
Redstart	44	92	Curvilinear	5.14 chicks	5.6 chicks	0.46 chicks	
Jay	44	11	Linear increase	3.42 chicks	3.93 chicks	0.51 chicks	Small sample
Wren	44	125	Curvilinear	3.61 chicks	4.23 chicks	0.62 chicks	
Nuthatch	44	76	Curvilinear	4.45 chicks	5.46 chicks	1.01 chicks	

3. Table of significant trends in Daily failure rate (eggs) measured between 1968-2012

Species	Period (yrs)	Mean annual sample	Trend	Predicted in first year	Predicted in last year	Change	Comment
Woodlark	44	23	Curvilinear	0.0609 nests/day	0.0269 nests/day	-0.034 nests/day	Small sample
Long-tailed Tit	44	59	Curvilinear	0.0362 nests/day	0.011 nests/day	-0.0252 nests/day	
Magpie	44	49	Linear decline	0.0269 nests/day	0.002 nests/day	-0.0249 nests/day	
Dipper	44	112	Curvilinear	0.0287 nests/day	0.0048 nests/day	-0.0239 nests/day	
Redshank	44	30	Curvilinear	0.0451 nests/day	0.0227 nests/day	-0.0224 nests/day	
Wheatear	44	16	Linear decline	0.0241 nests/day	0.0036 nests/day	-0.0205 nests/day	Small sample
Snipe	44	14	Linear decline	0.0313 nests/day	0.0134 nests/day	-0.0179 nests/day	Small sample
Woodpigeon	44	100	Curvilinear	0.0442 nests/day	0.0284 nests/day	-0.0158 nests/day	
Yellowhammer	44	63	Curvilinear	0.0494 nests/day	0.034 nests/day	-0.0154 nests/day	
Sand Martin	44	43	Curvilinear	0.0185 nests/day	0.0036 nests/day	-0.0149 nests/day	
Carrion Crow	44	48	Curvilinear	0.0189 nests/day	0.004 nests/day	-0.0149 nests/day	Includes Hooded Crow
Stock Dove	44	115	Curvilinear	0.018 nests/day	0.0065 nests/day	-0.0115 nests/day	
Pied Wagtail	44	89	Linear decline	0.018 nests/day	0.0068 nests/day	-0.0112 nests/day	
Robin	44	228	Curvilinear	0.024 nests/day	0.0133 nests/day	-0.0107 nests/day	
Wood Warbler	44	25	Curvilinear	0.022 nests/day	0.0125 nests/day	-0.0095 nests/day	Small sample
Tawny Owl	44	67	Curvilinear	0.0109 nests/day	0.0022 nests/day	-0.0087 nests/day	Nocturnal species
Grey Wagtail	44	58	Linear decline	0.0178 nests/day	0.0094 nests/day	-0.0084 nests/day	
Starling	44	121	Linear decline	0.0108 nests/day	0.0025 nests/day	-0.0083 nests/day	

Species	Period (yrs)	Mean annual sample	Trend	Predicted in first year	Predicted in last year	Change	Comment
Redstart	44	78	Curvilinear	0.0136 nests/day	0.0058 nests/day	-0.0078 nests/day	
Buzzard	44	29	Linear decline	0.0081 nests/day	0.0005 nests/day	-0.0076 nests/day	Small sample
Barn Owl	44	30	Linear decline	0.0076 nests/day	0.0005 nests/day	-0.0071 nests/day	Small sample
House Sparrow	44	114	Linear decline	0.0106 nests/day	0.004 nests/day	-0.0066 nests/day	
Kestrel	44	41	Curvilinear	0.0073 nests/day	0.0012 nests/day	-0.0061 nests/day	
Nuthatch	44	56	Linear decline	0.0084 nests/day	0.0023 nests/day	-0.0061 nests/day	
Marsh Tit	44	21	Linear decline	0.0072 nests/day	0.0012 nests/day	-0.006 nests/day	Small sample
Wren	44	139	Linear decline	0.0181 nests/day	0.0125 nests/day	-0.0056 nests/day	
Jackdaw	44	72	Curvilinear	0.0083 nests/day	0.003 nests/day	-0.0053 nests/day	
Merlin	44	23	Linear decline	0.0069 nests/day	0.0017 nests/day	-0.0052 nests/day	Small sample
Greenfinch	44	122	Curvilinear	0.026 nests/day	0.0208 nests/day	-0.0052 nests/day	
Tree Sparrow	44	382	Linear decline	0.0082 nests/day	0.0033 nests/day	-0.0049 nests/day	
Sparrowhawk	44	31	Linear decline	0.0047 nests/day	0.0006 nests/day	-0.0041 nests/day	
Tree Pipit	44	14	Curvilinear	0.0463 nests/day	0.0423 nests/day	-0.004 nests/day	Small sample
Peregrine	44	24	Linear decline	0.0069 nests/day	0.0029 nests/day	-0.004 nests/day	Small sample
Great Tit	44	657	Curvilinear	0.0061 nests/day	0.0027 nests/day	-0.0034 nests/day	
Treecreeper	44	22	Curvilinear	0.0232 nests/day	0.0198 nests/day	-0.0034 nests/day	Small sample
Coal Tit	44	56	Linear decline	0.0048 nests/day	0.0015 nests/day	-0.0033 nests/day	
Pied Flycatcher	44	442	Curvilinear	0.0057 nests/day	0.0026 nests/day	-0.0031 nests/day	
Raven	44	22	Curvilinear	0.0026 nests/day	0.0003 nests/day	-0.0023 nests/day	Small sample
Spotted Flycatcher	44	115	Curvilinear	0.0176 nests/day	0.0157 nests/day	-0.0019 nests/day	
Collared Dove	44	62	Curvilinear	0.0323 nests/day	0.0305 nests/day	-0.0018 nests/day	
Blue Tit	44	777	Curvilinear	0.004 nests/day	0.0022 nests/day	-0.0018 nests/day	
Blackcap	44	53	Curvilinear	0.0232 nests/day	0.0217 nests/day	-0.0015 nests/day	
Reed Warbler	44	190	Curvilinear	0.0176 nests/day	0.017 nests/day	-0.0006 nests/day	
Dunnock	44	157	Curvilinear	0.0256 nests/day	0.0254 nests/day	-0.0002 nests/day	
Grey Heron	44	17	Curvilinear	0 nests/day	0.0001 nests/day	0.0001 nests/day	Small sample
Swift	44	39	Curvilinear	0 nests/day	0.0019 nests/day	0.0019 nests/day	
Meadow Pipit	44	49	Curvilinear	0.0206 nests/day	0.0233 nests/day	0.0027 nests/day	
Sedge Warbler	44	41	Curvilinear	0.0148 nests/day	0.0201 nests/day	0.0053 nests/day	
Garden Warbler	44	23	Curvilinear	0.0173 nests/day	0.0232 nests/day	0.0059 nests/day	Small sample
Linnet	44	173	Linear increase	0.018 nests/day	0.0244 nests/day	0.0064 nests/day	
Whitethroat	44	45	Curvilinear	0.0102 nests/day	0.0179 nests/day	0.0077 nests/day	
Goldfinch	44	38	Linear increase	0.0194 nests/day	0.0274 nests/day	0.008 nests/day	
Willow Warbler	44	69	Linear increase	0.0094 nests/day	0.0175 nests/day	0.0081 nests/day	
Skylark	44	44	Curvilinear	0.0365 nests/day	0.0454 nests/day	0.0089 nests/day	
Lapwing	44	212	Curvilinear	0.0158 nests/day	0.0248 nests/day	0.009 nests/day	
Moorhen	44	139	Linear increase	0.0109 nests/day	0.0224 nests/day	0.0115 nests/day	
Curlew	44	21	Curvilinear	0.029 nests/day	0.0417 nests/day	0.0127 nests/day	Small sample
Blackbird	44	302	Curvilinear	0.0258 nests/day	0.039 nests/day	0.0132 nests/day	
Ringed Plover	44	126	Curvilinear	0.0254 nests/day	0.0387 nests/day	0.0133 nests/day	
Chaffinch	44	190	Curvilinear	0.0301 nests/day	0.0443 nests/day	0.0142 nests/day	
Reed Bunting	44	51	Linear increase	0.0079 nests/day	0.0237 nests/day	0.0158 nests/day	
Nightjar	44	25	Linear increase	0.0135 nests/day	0.0366 nests/day	0.0231 nests/day	Small sample
Whinchat	44	18	Linear increase	0.0052 nests/day	0.0325 nests/day	0.0273 nests/day	Small sample
Oystercatcher	44	164	Curvilinear	0.0141 nests/day	0.0431 nests/day	0.029 nests/day	

4. Table of significant trends in Daily failure rate (chicks) measured between 1968-2012

Species	Period (yrs)	Mean annual sample	Trend	Predicted in first year	Predicted in last year	Change	Comment
Swift	44	53	Curvilinear	1 nests/day	0.0038 nests/day	-0.9962 nests/day	
Skylark	44	53	Linear decline	0.0478 nests/day	0.0302 nests/day	-0.0176 nests/day	
Magpie	44	48	Linear decline	0.0163 nests/day	0.001 nests/day	-0.0153 nests/day	
Grey Wagtail	44	56	Linear decline	0.022 nests/day	0.0072 nests/day	-0.0148 nests/day	
Corn Bunting	44	15	Curvilinear	0.0466 nests/day	0.0336 nests/day	-0.013 nests/day	Small sample
Reed Warbler	44	146	Curvilinear	0.0215 nests/day	0.0094 nests/day	-0.0121 nests/day	
Meadow Pipit	44	68	Curvilinear	0.0313 nests/day	0.02 nests/day	-0.0113 nests/day	
Sand Martin	44	69	Linear decline	0.0106 nests/day	0.0006 nests/day	-0.01 nests/day	
Jackdaw	44	65	Curvilinear	0.0133 nests/day	0.0035 nests/day	-0.0098 nests/day	
Blackbird	44	247	Linear decline	0.0286 nests/day	0.0192 nests/day	-0.0094 nests/day	

Species	Period (yrs)	Mean annual sample	Trend	Predicted in first year	Predicted in last year	Change	Comment
Redstart	44	56	Linear decline	0.0121 nests/day	0.0033 nests/day	-0.0088 nests/day	
Tree Sparrow	44	263	Linear decline	0.0141 nests/day	0.006 nests/day	-0.0081 nests/day	
House Sparrow	44	115	Curvilinear	0.0152 nests/day	0.0087 nests/day	-0.0065 nests/day	
Carrion Crow	44	41	Linear decline	0.0072 nests/day	0.0011 nests/day	-0.0061 nests/day	Includes Hooded Crow
Merlin	44	28	Linear decline	0.0083 nests/day	0.0024 nests/day	-0.0059 nests/day	Small sample
Yellowhammer	44	50	Curvilinear	0.0432 nests/day	0.0385 nests/day	-0.0047 nests/day	
Stock Dove	44	75	Linear decline	0.0113 nests/day	0.0069 nests/day	-0.0044 nests/day	
Starling	44	139	Curvilinear	0.0065 nests/day	0.0031 nests/day	-0.0034 nests/day	
Tawny Owl	44	101	Linear decline	0.0048 nests/day	0.0015 nests/day	-0.0033 nests/day	Nocturnal species
Barn Owl	44	138	Curvilinear	0.0031 nests/day	0.0003 nests/day	-0.0028 nests/day	
Woodpigeon	44	81	Curvilinear	0.02 nests/day	0.0177 nests/day	-0.0023 nests/day	
Nuthatch	44	62	Linear decline	0.0043 nests/day	0.0021 nests/day	-0.0022 nests/day	
Stonechat	44	63	Curvilinear	0.0167 nests/day	0.0159 nests/day	-0.0008 nests/day	
Swallow	44	512	Linear increase	0.0032 nests/day	0.0043 nests/day	0.0011 nests/day	
Moorhen	44	52	Linear increase	0.0004 nests/day	0.0019 nests/day	0.0015 nests/day	
Whinchat	44	29	Curvilinear	0.0244 nests/day	0.0261 nests/day	0.0017 nests/day	Small sample
Dunnock	44	126	Curvilinear	0.0249 nests/day	0.0267 nests/day	0.0018 nests/day	
Coal Tit	44	58	Linear increase	0.0018 nests/day	0.0046 nests/day	0.0028 nests/day	
Wren	44	95	Linear increase	0.0074 nests/day	0.0105 nests/day	0.0031 nests/day	
Pied Flycatcher	44	364	Linear increase	0.0037 nests/day	0.0069 nests/day	0.0032 nests/day	
Willow Warbler	44	129	Linear increase	0.0154 nests/day	0.0205 nests/day	0.0051 nests/day	
Chaffinch	44	128	Curvilinear	0.0305 nests/day	0.0357 nests/day	0.0052 nests/day	
Nightjar	44	23	Curvilinear	0.0018 nests/day	0.0095 nests/day	0.0077 nests/day	Small sample
Linnet	44	123	Linear increase	0.015 nests/day	0.0237 nests/day	0.0087 nests/day	
Long-tailed Tit	44	40	Linear increase	0.0072 nests/day	0.0214 nests/day	0.0142 nests/day	
Garden Warbler	44	20	Linear increase	0.0109 nests/day	0.0277 nests/day	0.0168 nests/day	Small sample
Wood Warbler	44	31	Curvilinear	0.0261 nests/day	0.0501 nests/day	0.024 nests/day	

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 45 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 should be considered as early warnings, indicating that conservation issues may be developing for the species concerned. Some short-term declines might stem, however, from normal 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 interest more-general readers of the report. Similar alerts for wetland birds are provided by the Wetland Bird Survey (Cook *et al*. 2013).

Where this section discusses conservation-listed species, it uses the 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 and these criteria are also shown on our species pages. All UK breeding birds that are red listed will necessarily have met red-list criteria for UK decline, but amber-listed birds may be listed for reasons other than breeding decline (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% 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 45 years 1967–2012) and over 25 years (1987–2012). 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.Turtle Dove now has the strongest long-term UK decline of any species. Tree Sparrow, which headed this table last year, has shown significant increases in numbers since 1995 and is now in second place. The figures forLesser 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 Turtle Dove and 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
Turtle Dove	45	CBC/BBS UK	-95	-97	-93	>50	
Turtle Dove	25	CBC/BBS UK	-92	-95	-89	>50	
Tree Sparrow	45	CBC/BBS England	-95	-98	-91	>50	
Tree Sparrow	25	CBC/BBS England	-55	-77	-15	>50	
Willow Tit	45	CBC/BBS UK	-92	-97	-85	>50	
Willow Tit	25	CBC/BBS UK	-91	-95	-85	>50	
Grey Partridge	45	CBC/BBS UK	-91	-94	-87	>50	
Grey Partridge	25	CBC/BBS UK	-76	-82	-69	>50	
Spotted Flycatcher	45	CBC/BBS UK	-89	-94	-85	>50	
Spotted Flycatcher	25	CBC/BBS UK	-80	-86	-75	>50	
Starling	45	CBC/BBS England	-89	-92	-85	>50	
Starling	25	CBC/BBS England	-79	-83	-75	>50	
Corn Bunting	45	CBC/BBS UK	-88	-94	-79	>50	
Corn Bunting	25	CBC/BBS UK	-61	-78	-38	>50	
Tree Pipit	45	CBC/BBS England	-86	-93	-72	>50	
Tree Pipit	25	CBC/BBS England	-85	-92	-78	>50	
Lesser Redpoll	45	CBC/BBS England	-82	-93	-60	>50	
Lesser Redpoll	25	CBC/BBS England	-85	-93	-73	>50	
Cuckoo	45	CBC/BBS England	-76	-83	-66	>50	
Cuckoo	25	CBC/BBS England	-73	-78	-69	>50	
Marsh Tit	45	CBC/BBS UK	-74	-82	-65	>50	
Marsh Tit	25	CBC/BBS UK	-42	-54	-25	>25	
Yellow Wagtail	45	CBC/BBS UK	-73	-89	-39	>50	
Yellow Wagtail	25	CBC/BBS UK	-63	-76	-49	>50	
Linnet	45	CBC/BBS England	-72	-79	-65	>50	

Species	Period (yrs)	Source	Change (%)	Lower limit	Upper limit	Alert	Comment
Linnet	25	CBC/BBS England	-4	-21	20		
House Sparrow	35	CBC/BBS England	-68	-77	-58	>50	
House Sparrow	25	CBC/BBS England	-41	-56	-22	>25	
Skylark	45	CBC/BBS England	-63	-70	-56	>50	
Skylark	25	CBC/BBS England	-33	-39	-23	>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
Song Thrush	45	CBC/BBS UK	-58	-64	-51	>50	
Song Thrush	25	CBC/BBS UK	-6	-16	4		
Lapwing	45	CBC/BBS UK	-56	-76	-31	>50	
Lapwing	25	CBC/BBS UK	-57	-66	-44	>50	
Yellowhammer	45	CBC/BBS UK	-56	-64	-43	>50	
Yellowhammer	25	CBC/BBS UK	-49	-55	-42	>25	

For Marsh Tit, Linnet, House Sparrow, Skylark, Song Thrush and Yellowhammer 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 Linnet and Song Thrush, the 25-year trend is effectively stable.

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 45 years 1967–2012). Where available the 25-year change (1987–2012) 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	45	CBC/BBS England	-69	-88	-7	>50	
House Martin	25	CBC/BBS England	-57	-82	3		
Redshank	37	WBS/WBBS waterways	-64	-88	-40	>50	
Redshank	25	WBS/WBBS waterways	-62	-77	-42	>50	
Mistle Thrush	45	CBC/BBS UK	-61	-68	-53	>50	
Mistle Thrush	25	CBC/BBS UK	-45	-52	-37	>25	
Grey Wagtail	37	WBS/WBBS waterways	-60	-67	-48	>50	
Grey Wagtail	25	WBS/WBBS waterways	-33	-43	-19	>25	
Willow Warbler	45	CBC/BBS England	-60	-72	-45	>50	
Willow Warbler	25	CBC/BBS England	-58	-66	-52	>50	
Whitethroat	45	CBC/BBS UK	-57	-69	-42	>50	
Whitethroat	25	CBC/BBS UK	103	76	134		
Little Grebe	37	WBS/WBBS waterways	-53	-78	-9	>50	
Little Grebe	25	WBS/WBBS waterways	-28	-57	19		
Common Sandpiper	37	WBS/WBBS waterways	-48	-63	-35	>25	
Common Sandpiper	25	WBS/WBBS waterways	-51	-61	-42	>50	
Meadow Pipit	45	CBC/BBS England	-47	-74	-18	>25	
Meadow Pipit	25	CBC/BBS England	-27	-43	-4	>25	
Bullfinch	45	CBC/BBS UK	-40	-51	-26	>25	
Bullfinch	25	CBC/BBS UK	-2	-14	13		
Curlew	45	CBC/BBS England	-38	-78	20		
Curlew	25	CBC/BBS England	-25	-51	4		
Dunnock	45	CBC/BBS UK	-34	-43	-22	>25	
Dunnock	25	CBC/BBS UK	16	6	28		
Reed Bunting	45	CBC/BBS UK	-29	-49	-9	>25	

Species	Period (yrs)	Source	Change (%)	Lower limit	Upper limit	Alert	Comment
Reed Bunting	25	CBC/BBS UK	3	-15	25		

Eight species raise high alerts, having shown significant declines of greater than 50%, and are therefore potential red-list candidates. The English House Martin population shows a long-term decline, of more than 50%, that for the first time is statistically significantly different from no change and thus raises a formal alert. The species is now therefore a strong candidate for red listing, although BBS data indicate little change since 1995 in the UK as a whole and increases in Scotland and Northern Ireland. 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. Accelerating decline for Mistle Thrush has taken its 45-year trend well past the 50% threshold for 'rapid decline'. Grey Wagtail has also dropped steeply in recent seasons, raising alerts in the long-term and 25-year reporting periods. 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. Whitethroat shows substantial decline over the 45-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. For Little Grebe, the decline on waterways has been strong and significant; much of the decrease occurred during the 1980s, however, and BBS results show little change since 1995. Common Sandpiper populations have about halved according to the 37-year and 25-year trends, but the long-term trend is marginally below the 50% threshold and only the 25-year trend raises the higher level of alert.

Four species raise only the lower level of alert. Meadow Pipit meets the 25% criterion (equivalent to amber listing) in both periods. Populations of Bullfinch, Dunnock and Reed Bunting are recovering and show stable or increasing trends over the shorter, 25-year period. Data for Curlew suggest a similar overall rate of decline but their trends should be treated with caution, as the confidence intervals are very wide.

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 (for declines) 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	37	WBS/WBBS waterways	-92	-98	-76	>50	Small sample
Snipe	25	WBS/WBBS waterways	-89	-97	-79	>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	45	CBC/BBS UK	-68	-82	-50	>50	
Little Owl	25	CBC/BBS UK	-65	-76	-52	>50	
Dipper	37	WBS/WBBS waterways	-32	-50	-4	>25	
Dipper	25	WBS/WBBS waterways	-27	-42	-2	>25	
Tawny Owl	25	CBC/BBS UK	-31	-45	-13	>25	
Sedge Warbler	45	CBC/BBS UK	-26	-60	5		
Greenfinch	45	CBC/BBS UK	-26	-42	-8	>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 UK 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 annual census data indicating a trend are from CBC, which recorded steep declines. Because the CBC samples were small, however, and its mapping method not well suited to monitoring this species, the CBC trend is no longer used to support the species' conservation listing. Major range contractions for Woodcock and the declines indicated by special surveys confirm that a high alert is warranted, however.

Little Owl also meets red-list criteria for population decline but, as an introduced species, is not eligible for any conservation listing. 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 and the 25-year change has also passed this threshold. 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 like these.

Greenfinch and Sedge Warbler are new, since last year, among green-listed species that have decreased by more than 25%, though the trend for Sedge Warbler is not statistically significant and so does not formally raise an alert.

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 1975–2012).

Table A4 Population declines of greater than 25% recorded by the joint Waterways Bird Survey/Waterways Breeding Bird Survey (WBS/WBBS) between 1975 and 2013

Species	Period (yrs)	Source	Change (%)	Lower limit	Upper limit	Alert	Comment
Yellow Wagtail	37	WBS/WBBS waterways	-96	-99	-93	>50	
Snipe	37	WBS/WBBS waterways	-92	-98	-76	>50	Small sample
Pied Wagtail	37	WBS/WBBS waterways	-65	-73	-55	>50	
Redshank	37	WBS/WBBS waterways	-64	-88	-40	>50	
Reed Bunting	37	WBS/WBBS waterways	-62	-73	-46	>50	
Grey Wagtail	37	WBS/WBBS waterways	-60	-67	-48	>50	
Little Grebe	37	WBS/WBBS waterways	-53	-78	-9	>50	
Lapwing	32	WBS/WBBS waterways	-52	-76	-21	>50	
Common Sandpiper	37	WBS/WBBS waterways	-48	-63	-35	>25	
Sedge Warbler	37	WBS/WBBS waterways	-47	-64	-22	>25	
Moorhen	37	WBS/WBBS waterways	-33	-49	-11	>25	
Dipper	37	WBS/WBBS waterways	-32	-50	-4	>25	

Six species are included here for which the WBS/WBBS trend is not the headline one and so is not listed in Tables A2 or A3. These species are discussed briefly below. The trends for Yellow Wagtail, Reed Bunting and Lapwing are consistent in direction with the 44-year trends reported from CBC/BBS, but in each case the declines on waterways have been more severe. The Pied Wagtail declines along waterways are intriguing because they contrast markedly with the fluctuating but generally upward trend as measured by CBC/BBS.

For Sedge Warbler, the headline trend for the UK is a non-significant 45-year moderate 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 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 28 years (Table A5).

Table A5 Population declines of greater than 25% recorded by the Constant Effort Sites scheme between 1984 and 2013

Species	Period (yrs)	Source	Change (%)	Lower limit	Upper limit	Alert	Comment
Lesser Whitethroat	28	CES adults	-68	-82	-54	>50	
Lesser Whitethroat	25	CES adults	-74	-84	-65	>50	
Willow Warbler	28	CES adults	-68	-75	-61	>50	
Willow Warbler	25	CES adults	-65	-72	-58	>50	
Willow Tit	28	CES adults	-67	-90	-35	>50	Small sample
Willow Tit	25	CES adults	-72	-92	-45	>50	Small sample
Reed Bunting	28	CES adults	-64	-73	-49	>50	
Reed Bunting	25	CES adults	-59	-70	-43	>50	
Sedge Warbler	28	CES adults	-42	-56	-20	>25	
Sedge Warbler	25	CES adults	-56	-66	-45	>50	
Reed Warbler	28	CES adults	-31	-46	-10	>25	

Species	Period (yrs)	Source	Change (%)	Lower limit	Upper limit	Alert	Comment
Song Thrush	28	CES adults	-30	-43	-13	>25	

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

For reasons unknown, CES trends for Lesser Whitethroat, Reed Bunting, 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 (2002–12 in all but two cases), for all of the declining species listed in Tables A1–A3 (previous section). 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 Wood Warbler and Grasshopper Warbler (both red listed), and Whinchat, Nightingale, Swift and Red Grouse (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	-80	-84	-75	>50	
Willow Tit	10	CBC/BBS UK	-62	-72	-52	>50	
Little Owl	10	CBC/BBS UK	-54	-64	-40	>50	
Lesser Spotted Woodpecker	10	CBC to 1999	-51	-75	-22	>50	Small sample
Snipe	10	WBS/WBBS waterways	-48	-70	-14	>25	
Grey Wagtail	10	WBS/WBBS waterways	-47	-53	-38	>25	
Cuckoo	10	CBC/BBS England	-46	-49	-42	>25	
Starling	10	CBC/BBS England	-45	-49	-42	>25	
Greenfinch	10	CBC/BBS UK	-40	-43	-37	>25	
Redshank	10	WBS/WBBS waterways	-40	-52	-11	>25	
Woodcock	10	CBC to 1999	-40	-62	-11	>25	Small sample
Mistle Thrush	10	CBC/BBS UK	-39	-43	-35	>25	
Lapwing	10	CBC/BBS UK	-37	-42	-31	>25	
Grey Partridge	10	CBC/BBS UK	-36	-45	-25	>25	
Marsh Tit	10	CBC/BBS UK	-33	-44	-22	>25	
Whinchat	10	BBS UK	-33	-46	-16	>25	
Spotted Flycatcher	10	CBC/BBS UK	-31	-48	-12	>25	
Tree Pipit	10	CBC/BBS England	-28	-43	-9	>25	
House Martin	10	CBC/BBS England	-27	-33	-19	>25	
Common Sandpiper	10	WBS/WBBS waterways	-26	-38	-14	>25	
Wood Warbler	10	BBS UK	-25	-47	6		
Swift	10	BBS UK	-24	-31	-18		
Curlew	10	CBC/BBS England	-21	-28	-13		
Yellow Wagtail	10	CBC/BBS UK	-21	-32	-5		
Nightingale	10	BBS England	-21	-40	10		
Dipper	10	WBS/WBBS waterways	-17	-30	5		
Little Grebe	10	WBS/WBBS waterways	-15	-41	28		
Song Thrush	10	CBC/BBS UK	-15	-18	-12		
Tawny Owl	10	CBC/BBS UK	-14	-27	6		
Linnet	10	CBC/BBS England	-13	-18	-6		
Meadow Pipit	10	CBC/BBS England	-13	-21	-5		
Skylark	10	CBC/BBS England	-12	-16	-8		
Sedge Warbler	10	CBC/BBS UK	-11	-25	0		
Corn Bunting	10	CBC/BBS UK	-10	-29	13		
Willow Warbler	10	CBC/BBS England	-7	-13	-3		
Yellowhammer	10	CBC/BBS UK	-5	-10	0		
Grasshopper Warbler	10	BBS UK	2	-7	44		
House Sparrow	10	CBC/BBS England	2	-2	8		
Dunnock	10	CBC/BBS UK	4	1	8		

Species	Period (yrs)	Source	Change (%)	Lower limit	Upper limit	Alert	Comment
Red Grouse	10	BBS UK	6	-13	18		
Reed Bunting	10	CBC/BBS UK	8	-1	19		
Whitethroat	10	CBC/BBS UK	19	16	26		
Bullfinch	10	CBC/BBS UK	23	14	34		
Tree Sparrow	10	CBC/BBS England	53	27	83		
Lesser Redpoll	10	CBC/BBS England	61	1	111		

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 Turtle Dove, Willow Tit and Little Owl have halved within just the last ten years, or even a shorter period. These are the only species in long-term decline that suffered a 50% fall during 2002–12, but Lesser Spotted Woodpecker also met these criteria during the most recent ten-year period for which data are available. A further 16 species also continue to raise alerts, having declined significantly by more than 25% (but less than 50%) in their most recent 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 raise 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 (33 in all, including non-significant declines for Wood Warbler, Nightingale, Dipper, Little Grebe and Tawny Owl) are on course for new or renewed 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 significant population change, over the ten-year period are Corn Bunting, Willow Warbler, Yellowhammer, Grasshopper Warbler, House Sparrow, Red Grouse and Reed Bunting.

Five 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 remains 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 strong increase in Tree Sparrow and Lesser Redpoll numbers is very welcome but the upturns are coming from such a low level that numbers remain far below those of the mid 1970s, with the population trend graphs still showing little sign of clear recovery.

Increasing species

Population changes of species for which our best long-term trend estimate from CBC/BBS (usually over 45 years) or from WBS/WBBS (a maximum of 37 years) shows an increase of more than 50% are shown in Table C1. There are 30 species listed, unchanged now for a third year. Eighteen of the species have more than doubled their population size over the periods given; three species (Magpie, Long-tailed Tit and Reed Warbler) have fallen marginally below this threshold since last year.

Table C1 Long-term population increases of greater than 50% from CBC/BBS (1967-2013) or WBS/WBBS (1975-2013), using the best survey for each species

Species	Period (yrs)	Source	Change (%)	Lower limit	Upper limit	Alert	Comment
Buzzard	45	CBC/BBS England	735	444	1822		
Greylag Goose	19	WBS/WBBS waterways	418	129	1153		
Great Spotted Woodpecker	45	CBC/BBS UK	399	280	690		
Collared Dove	40	CBC/BBS UK	361	196	558		
Shelduck	31	CBC to 1999	300	94	787		Small sample
Blackcap	45	CBC/BBS UK	280	219	370		
Canada Goose	31	WBS/WBBS waterways	255	55	1054		
Mute Swan	45	CBC/BBS UK	254	57	666		
Nuthatch	45	CBC/BBS UK	252	151	396		
Green Woodpecker	45	CBC/BBS England	198	134	332		
Stock Dove	45	CBC/BBS England	186	90	353		
Coot	45	CBC/BBS UK	173	73	447		
Woodpigeon	45	CBC/BBS UK	173	51	519		
Mallard	45	CBC/BBS UK	163	102	220		
Sparrowhawk	37	CBC/BBS England	145	60	313		
Carrion Crow	45	CBC/BBS England	132	84	193		
Jackdaw	45	CBC/BBS UK	126	46	263		
Great Tit	45	CBC/BBS UK	107	80	134		
Magpie	45	CBC/BBS UK	100	65	150		
Long-tailed Tit	45	CBC/BBS England	98	45	183		
Goldfinch	45	CBC/BBS England	96	44	148		
Reed Warbler	45	CBC/BBS UK	94	37	281		
Pheasant	45	CBC/BBS England	88	51	171		
Chiffchaff	45	CBC/BBS UK	85	49	133		
Goosander	31	WBS/WBBS waterways	78	14	196		
Coal Tit	45	CBC/BBS UK	65	6	177		
Tufted Duck	37	WBS/WBBS waterways	64	-32	303		
Oystercatcher	37	WBS/WBBS waterways	57	21	152		
Wren	45	CBC/BBS UK	55	35	71		
Pied Wagtail	45	CBC/BBS UK	50	10	112		

This table is led by Buzzard but it should be noted that six 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 1060% (more than an elevenfold increase) over the 17 years 1995–2012. Arguably, however, this is more a conservation problem than a success! Unmitigated successes are the growth during 1995–2012, estimated through BBS, of the reintroduced Red Kite (+805%) and of Barn Owl (+277%). Little Egret and Gadwall, included in this report for the first time in 2014, have increased by an estimated 277% and 124% respectively but in this case over just the recent ten-year period. Though the trajectory has been moderated considerably by recent cold-weather-related setbacks, attention should also be drawn to the rapid rise of Cetti's Warbler, a newly established native species, which CES now estimates to have increased by 384% since 1987.

Four groups stand out among the increasing species: corvids – Carrion Crow, Magpie and Jackdaw; doves – Collared Dove, Stock Dove and Woodpigeon; woodpeckers and other smaller species of woodland and gardens; 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 the third group are species primarily of woodland that are also common in gardens in some areasGreat 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 50% on CBC/BBS plots over 45 years, but declined by 65% on WBS/WBBS plots over the past 37 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 205% over 37 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 57% on WBS/WBBS plots over the last 37 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 after the banning of certain poisonous farmland pesticides in the early 1960s, assisted by lower levels of illegal predator control by shooting interests. Buzzards increased by a remarkable 735% between 1967 and 2012, with a rapid increase of 80% over the last ten years alone. Sparrowhawks, too scarce for CBC to monitor until the mid 1970s, showed a 145% increase over the 37-year period from 1975 to 2012. However, their recovery appears to have been completed earlier than Buzzard's, with the population currently stable or in shallow decline.

While Pheasant holds a place in this table, its increase in census data has been driven largely by the hugely increasing scale of releases of artificially reared poults 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 (clutch size, brood size and failure rates at the egg and nestling stages) that can be combined to give an overall estimate of productivity per nesting 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. The data collected allow annual variation in clutch size, brood size and stage-specific nest failure rates, to be assessed 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, 40 species exhibited significant trends in FPBA over the past 44 years, of which 13 were negative, indicating that reproductive output has decreased over time. Birds exhibiting declines in productivity include three BoCC red-listed species (Nightjar, Tree Pipit and Linnet), three amber-listed species (Willow Warbler, Dunnock and Bullfinch) and seven green-listed species (Moorhen, Coal Tit, Garden Warbler, Sedge Warbler, Treecreeper, Chaffinch and Greenfinch). While productivity of Moorhen, Nightjar, Willow Warbler, Garden Warbler and Linnet has been falling consistently, trends for the other eight 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 2012

Species	Period (yrs)	Mean annual sample	Trend	Predicted in first year	Predicted in last year	Change	Comment
Nightjar	44	22	Linear decline	1.41 fledglings	0.72 fledglings	-0.69 fledglings	Small sample
Garden Warbler	44	19	Linear decline	3.06 fledglings	2.38 fledglings	-0.68 fledglings	Small sample
Coal Tit	44	54	Curvilinear	6.67 fledglings	6.09 fledglings	-0.58 fledglings	
Moorhen	44	52	Linear decline	2.52 fledglings	2.08 fledglings	-0.44 fledglings	
Willow Warbler	44	69	Linear decline	3.59 fledglings	3.15 fledglings	-0.44 fledglings	
Linnet	44	123	Linear decline	2.72 fledglings	2.31 fledglings	-0.41 fledglings	
Chaffinch	44	128	Curvilinear	1.58 fledglings	1.24 fledglings	-0.34 fledglings	
Tree Pipit	44	14	Curvilinear	1.62 fledglings	1.37 fledglings	-0.25 fledglings	Small sample
Greenfinch	44	90	Curvilinear	2.14 fledglings	1.94 fledglings	-0.2 fledglings	
Sedge Warbler	44	39	Curvilinear	2.95 fledglings	2.89 fledglings	-0.06 fledglings	
Bullfinch	44	34	Curvilinear	1.52 fledglings	1.46 fledglings	-0.06 fledglings	
Treecreeper	44	20	Curvilinear	2.74 fledglings	2.69 fledglings	-0.05 fledglings	Small sample
Dunnock	44	121	Curvilinear	1.68 fledglings	1.66 fledglings	-0.02 fledglings	
Blackbird	44	246	Curvilinear	1.5 fledglings	1.51 fledglings	0.01 fledglings	
Corn Bunting	44	11	Curvilinear	1.61 fledglings	1.64 fledglings	0.03 fledglings	Small sample
Collared Dove	44	55	Curvilinear	0.81 fledglings	0.87 fledglings	0.06 fledglings	
Meadow Pipit	44	48	Curvilinear	2.07 fledglings	2.15 fledglings	0.08 fledglings	
House Sparrow	44	101	Curvilinear	2.3 fledglings	2.43 fledglings	0.13 fledglings	
Woodpigeon	44	80	Curvilinear	0.54 fledglings	0.71 fledglings	0.17 fledglings	
Yellowhammer	44	49	Curvilinear	0.82 fledglings	1.09 fledglings	0.27 fledglings	
Raven	44	22	Curvilinear	2.76 fledglings	3.08 fledglings	0.32 fledglings	Small sample
Robin	44	207	Linear increase	2.45 fledglings	2.82 fledglings	0.37 fledglings	
Reed Warbler	44	146	Linear increase	2.37 fledglings	2.75 fledglings	0.38 fledglings	
Stock Dove	44	75	Linear increase	0.99 fledglings	1.38 fledglings	0.39 fledglings	
Wren	44	95	Curvilinear	2.37 fledglings	2.78 fledglings	0.41 fledglings	
Skylark	44	42	Linear increase	1.09 fledglings	1.52 fledglings	0.43 fledglings	
Peregrine	44	23	Linear increase	1.78 fledglings	2.26 fledglings	0.48 fledglings	Small sample
Sparrowhawk	44	31	Curvilinear	2.64 fledglings	3.13 fledglings	0.49 fledglings	
Carrion Crow	44	40	Curvilinear	1.71 fledglings	2.22 fledglings	0.51 fledglings	Includes Hooded Crow
Pied Wagtail	44	88	Linear increase	3.01 fledglings	3.55 fledglings	0.54 fledglings	
Buzzard	44	29	Linear increase	1.52 fledglings	2.07 fledglings	0.55 fledglings	Small sample
Tawny Owl	44	67	Linear increase	1.39 fledglings	1.97 fledglings	0.58 fledglings	Nocturnal species
Kestrel	44	41	Curvilinear	2.91 fledglings	3.51 fledglings	0.6 fledglings	

Species	Period (yrs)	Mean annual sample	Trend	Predicted in first year	Predicted in last year	Change	Comment
Starling	44	115	Curvilinear	2.46 fledglings	3.15 fledglings	0.69 fledglings	
Jackdaw	44	61	Curvilinear	1.54 fledglings	2.28 fledglings	0.74 fledglings	
Grey Wagtail	44	54	Linear increase	2.6 fledglings	3.4 fledglings	0.8 fledglings	
Barn Owl	44	30	Linear increase	2.35 fledglings	3.22 fledglings	0.87 fledglings	Small sample
Merlin	44	21	Linear increase	2.47 fledglings	3.35 fledglings	0.88 fledglings	Small sample
Dipper	44	83	Curvilinear	2.06 fledglings	2.98 fledglings	0.92 fledglings	
Wheatear	44	16	Linear increase	3.51 fledglings	4.43 fledglings	0.92 fledglings	Small sample
Tree Sparrow	44	263	Linear increase	2.77 fledglings	3.83 fledglings	1.06 fledglings	
Magpie	44	42	Curvilinear	1.14 fledglings	2.36 fledglings	1.22 fledglings	
Redstart	44	56	Curvilinear	3.51 fledglings	4.99 fledglings	1.48 fledglings	
Nuthatch	44	55	Linear increase	3.73 fledglings	5.32 fledglings	1.59 fledglings	

See Key to species texts for help with interpretation

Work by Morrison *et al.* (2013b) using BBS data reported a consistent positive relationship between laltitude and the trajectory of long-distance migrant population trends within the UK, suggesting that abundance is, at least in part, determined by breeding success. 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 of bird species (Both *et al.* 2009), although there is evidence that the magnitude of these impacts may vary with diet and breeding habitat (Dunn & Møller 2013) and that reduced productivity may be buffered by density-dependent increase in survival in some species, including Reed *et al.* 2012, 2013). 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, Winkler *et al.* 2014); this mechanism could therefore contribute to the increasing nestling failure rates underpinning the productivity declines detected for Saino *et al.* 2004, 2011, Schaub *et al.* 2011, Ockendon *et al.* 2013, Finch *et al.* 2014).

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. These invertebrate groups form a significant element of the diet of all the long-distance migrants identified as displaying productivity declines, as well as residents such as 2013b) may reflect a more pronounced drop in invertebrate numbers in the south of the UK where conditions are generally drier.

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). 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. While the figures presented in this report indicate that Blue Tit and Great Tit brood sizes have fallen and that nestling stage failure rates of both these tit species and Pied Flycatcher have risen, as would be predicted under a mismatch scenario, FPBA trends are not significant due to a concurrent drop in egg-stage failure rates. However, FPBA of Chaffinch, another woodland insectivore heavily reliant on moth larvae to provision its offspring, has decreased significantly, as has that of Coal Tit; again, increasing nestling failure rates have contributed to these declines in productivity.

Increasing egg-stage failure rates are the main driver of the drop in Groom 1993, Stoate & Szczur 2001, 2006, White*et al.* 2014), 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, reviewed by Madden *et al.* 2015). However, several recent studies have suggested that predation pressure may increase in response to climatic warming. Cox*et al.* (2013) found that the incidence of nest predation by birds and snakes, but not mammals, increased with temperature in the USA, although the mechanism is unknown, while Auer & Martin (2013) demonstrated an increase in the proportion of predated nests across a range of species due to climate-induced shifts in plant–herbivore interactions.

Increased grazing pressure by deer, numbers of which are rising rapidly in many areas of the UK (Newson*et al.* 2012), has been identified as a possible driver of population declines in the UK (Fuller *et al.* 2005) and the USA (Martin *et al.* 2011), the removal of the herb and shrub layers potentially reducing the availability of both food and well-concealed nesting sites. This process may have contributed to the observed declines in productivity of Willow Warbler, Garden Warbler, Dunnock and Bullfinch. A recent study using BBS deer data indicated that declines inWillow 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 Morrison*et al.* 2010). While a similar negative relationship was identified for Siriwardena *et al.* 1998a, 1999, 2000b, 2001, Proffitt *et al.* 2004).

Declining food availability may also be an issue for farmland bird species displaying negative trends in FPBA. Reduced access to winter stubbles due to changes in farming practices have been linked to declines in survival rates of species such as Siriwardena *et al.* 1998b, Peach *et al.* 1999, Siriwardena *et al.* 2000b). If adults of stubble-feeding species are in poorer condition at the start of the breeding season, their investment in reproduction may also be reduced, and the granivorous diet of Siriwardena *et al.* 1999, 2000b).

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 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.

The colonisation of urban habitats by Greenfinch may also have increased the proportion of data originating from gardens, which may represent a relatively resource-poor breeding environment when compared with their more traditional farmland habitats, resulting in the smaller broods and clutch sizes observed. Similar reductions in reproductive output across an urban gradient have been observed for tit species, although results from localised studies are conflicting (see Chamberlain *et al.* 2009 for review) and more research is need to see whether these are representative at a national scale. The recent outbreak of trichomonosis, which has significantly and rapidly reduced the abundance of Robinson *et al.* 2010b), could have impacted on breeding success and may also provide a good test of the hypothesis that productivity declines over the last 50 years represent a density-dependent response. Lehikoinen *et al.* 2013).

Greenwood & Baillie 2008). Moorhen populations were relatively stable until the recent run of cold winters, and the causes of the productivity decline in this poorly studied species are currently unclear. Failure rates at both the egg and chick stage have increased substantially, possibly due to increasing numbers of mammalian predators, such as American mink (*Neovison vison*) and Eurasian otter (*Lutra lutra*), or to the competitor species Coot, which are known to destroy clutches of Moorhens nesting nearby.

FPBA has increased significantly over the last 44 years for 31 species, across a wide range of taxonomic groups (Table D1). Population trends are also upward for 16 of these species, including raptors (Sparrowhawk, Buzzard, Barn Owl, Merlin, Peregrine), pigeons (Stock Dove, Woodpigeon, Collared Dove), corvids

(Magpie, Jackdaw, Carrion Crow, Raven), and some small passerines (Reed Warbler, Nuthatch, Wren and Robin). It is therefore possible that increasing productivity has contributed to the population growth exhibited by these species over recent decades. Conversely, 12 species (Tawny Owl, Kestrel, Skylark, Starling, Dipper, Wheatear, House Sparrow, Tree Sparrow, Grey Wagtail, Meadow Pipit, Yellowhammer and Corn Bunting), 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, 1984-2012, calculated from smoothed trend

Species	Period (yrs)	Plots (n)	Change (%)	Lower limit	Upper limit	Comment
Willow Tit	28	29	-69	-89	-7	
Goldfinch	28	37	-66	-86	-4	
Sedge Warbler	28	72	-61	-79	-37	
Blue Tit	28	104	-56	-68	-44	
Garden Warbler	28	78	-52	-69	-18	
Reed Bunting	28	62	-52	-71	-8	
Blackcap	28	99	-43	-59	-24	
Song Thrush	28	91	-41	-57	-18	
Blackbird	28	102	-39	-54	-18	
Great Tit	28	102	-36	-56	-10	
Willow Warbler	28	99	-29	-44	-5	
Chaffinch	28	84	88	18	266	

See Key to species texts for help with interpretation

Overall, 11 species exhibit significant declines in the proportion of juveniles captured (Table D2). The apparent productivity of Blue Tit, Willow Tit, Garden Warbler, Sedge Warbler, Goldfinch and Reed Bunting has fallen by more than 50% over the last 25 years, while Great Tit, Willow Warbler, Blackcap, Blackbird and Song Thrush show reductions in relative productivity of between 25% and 50%.

Although three of these species, Peach *et al.* 1991, 1995a, 1999, Robinson *et al.* 2004, 2010, 2014, Baillie *et al.* 2009). The potential susceptibility of long-distance migrants to climate-induced phenological disjunction is discussed above and it is interesting to note that the producitvity declines of Morrison *et al.* 2010).

Peach *et al.* 1999). For species such as Blue Tit, Great Tit, Blackcap and Goldfinch, where a concurrent 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. Garden Warbler populations have fluctuated but remained stable over the period during which CES has operated.

Only Chaffinch displays a significant increase in productivity at CE sites. 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

Since the mid 1970s, 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 the majority of species exhibiting significant trends since the late 1960s have advanced laying. Thus 42 species are laying between one and 30 days earlier, on average, than they were 44 years ago. 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), although the extent to which populations are able to adjust migratory strategies in response to enivironmental pressures and the predicted impact on population size is currently the focus of much discussion (James & Abbott 2014, Winkler *et al.* 2014). It is interesting to note that the magnitude of the laying-date shift in both Pied Flycatcher and Redstart (12 days and 14 days respectively), is greater than that displayed by many resident species, although their mean laying date is still approximately a fortnight later than non-migratory species with similar nestling diets, such as Blue Tit and Great Tit. No taxonomic or ecological associations are apparent within the within the group of species displaying laying-date advancements and a wide range of taxa demonstrate trends of a similar magnitude (Crick *et al.* 1997).

Table D3 Significant trends in laying date measured between 1968 and 2012

Species	Period (yrs)	Mean annual sample	Trend	Predicted in first year	Predicted in last year	Change	Comment

Species	Period (yrs)	Mean annual sample	Trend	Predicted in first year	Predicted in last year	Change	Comment
Magpie	44	33	Linear decline	Apr 23	Mar 24	-30 days	
Greenfinch	44	90	Linear decline	May 26	May 7	-19 days	
Long-tailed Tit	44	53	Linear decline	Apr 21	Apr 4	-17 days	
Goldfinch	44	24	Curvilinear	Jun 5	May 20	-16 days	Small sample
Redstart	44	66	Curvilinear	May 22	May 8	-14 days	
Dipper	44	69	Linear decline	Apr 19	Apr 6	-13 days	
Coal Tit	44	45	Linear decline	May 3	Apr 20	-13 days	
Nuthatch	44	32	Linear decline	May 2	Apr 19	-13 days	
Blackcap	44	42	Linear decline	May 24	May 12	-12 days	
Chiffchaff	44	59	Linear decline	May 15	May 3	-12 days	
Pied Flycatcher	44	447	Linear decline	May 21	May 9	-12 days	
Blue Tit	44	569	Linear decline	May 4	Apr 22	-12 days	
Treecreeper	44	13	Linear decline	May 7	Apr 25	-12 days	Small sample
Peregrine	44	11	Linear decline	Apr 14	Apr 3	-11 days	Small sample
Stonechat	44	44	Curvilinear	May 3	Apr 22	-11 days	
Marsh Tit	44	14	Linear decline	Apr 28	Apr 17	-11 days	Small sample
Great Tit	44	404	Curvilinear	May 2	Apr 21	-11 days	
Chaffinch	44	121	Linear decline	May 12	May 1	-11 days	
Corn Bunting	44	18	Linear decline	Jun 25	Jun 14	-11 days	Small sample
Robin	44	149	Curvilinear	Apr 27	Apr 17	-10 days	
Reed Warbler	44	216	Linear decline	Jun 20	Jun 10	-10 days	
Whitethroat	44	21	Curvilinear	May 27	May 17	-10 days	Small sample
Carrion Crow	44	30	Linear decline	Apr 18	Apr 8	-10 days	Includes Hooded Crow
House Sparrow	44	64	Linear decline	May 25	May 16	-9 days	
Kestrel	44	23	Linear decline	May 5	Apr 27	-8 days	Small sample
Swallow	44	214	Curvilinear	Jun 20	Jun 12	-8 days	
Grey Wagtail	44	61	Curvilinear	May 5	Apr 27	-8 days	
Sedge Warbler	44	47	Curvilinear	May 29	May 21	-8 days	
Garden Warbler	44	22	Linear decline	May 28	May 20	-8 days	Small sample
Willow Warbler	44	90	Linear decline	May 20	May 12	-8 days	
Ring Ouzel	44	23	Linear decline	May 14	May 7	-7 days	Small sample
Wood Warbler	44	36	Linear decline	May 26	May 19	-7 days	
Starling	44	85	Curvilinear	Apr 27	Apr 20	-7 days	
Tree Pipit	44	21	Curvilinear	May 27	May 21	-6 days	Small sample
Wren	44	87	Linear decline	May 14	May 8	-6 days	
Jackdaw	44	31	Curvilinear	Apr 23	Apr 17	-6 days	
Moorhen	44	82	Linear decline	May 9	May 4	-5 days	
Whinchat	44	31	Linear decline	May 30	May 25	-5 days	
Tree Sparrow	44	292	Linear decline	May 28	May 23	-5 days	
Oystercatcher	44	67	Curvilinear	May 19	May 16	-3 days	
Meadow Pipit	44	42	Curvilinear	May 19	May 17	-2 days	
Pied Wagtail	44	89	Curvilinear	May 18	May 16	-2 days	
Blackbird	44	246	Curvilinear	Apr 23	Apr 25	2 days	
Bullfinch	44	34	Linear increase	May 26	Jun 1	6 days	
Skylark	44	19	Curvilinear	May 24	May 31	7 days	Small sample
Yellowhammer	44	26	Linear increase	May 31	Jun 7	7 days	Small sample
Woodpigeon	44	91	Linear increase	Jun 2	Jun 22	20 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 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). However, while Reed *et al.* 2012, 2013). Whether such compensation wil persist as the climate warms further remains to be seen and the population-level significance of trophic mismatches remains an active research area with potentially important policy implications for conservation.

Only five species exhibit significant trends towards later laying, all of which produce multiple broods per season. A recent collaboration between BTO and Aberdeen University, using NRS data, identified an increase in the frequency of repeat brooding in 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 Chamberlain & Siriwardena 2000), but this species may also increasingly have moved to alternative habitats. A recent study using data from North

America and Europe identified a positive temporal trend in the length of the breeding season of multi-brooded, but not single-brooded, bird species, consistent with the hypothesis that climate change is extending the window of opportunity for nesting for species less reliant on peaks in seasonal resources (Dunn & Møller 2013).

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

This report is designed to 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. It 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. The information presented here is a summary of a very extensive and much more detailed data set held by the BTO.

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 demographic information 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

With the exception of the trends by habitat, 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 BirdTrends report is the latest in an annual 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 these are still available online.

The Utilities section also holds a unified list of the References that have been cited throughout the report.

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 editions are purely web-based and url addresses must be included in their citations.

Note that www.bto.org/about-birds/birdtrends will always link to the home page of the most recent version of this report. Web addresses including a year (e.g. .../birdtrends/2013/...) may lead you to earlier reports in the series, now superseded.

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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 permanent link to wherever an article can be found online.

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

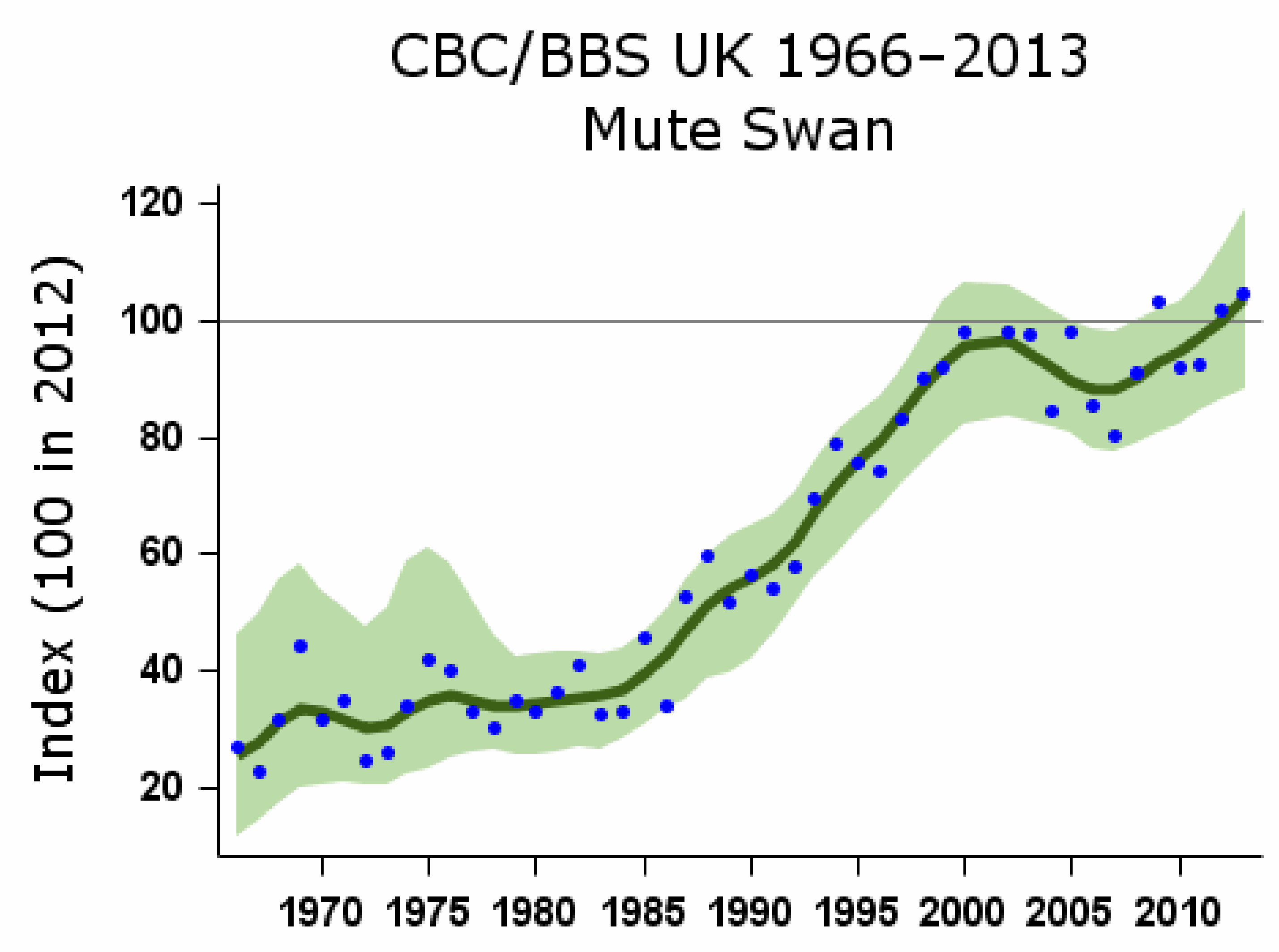
Key facts

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 (Austin et al. 2014). After a spell on the amber list during 2002-09, 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 2014a).



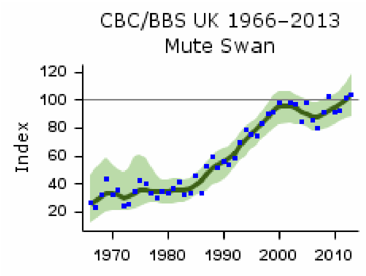
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

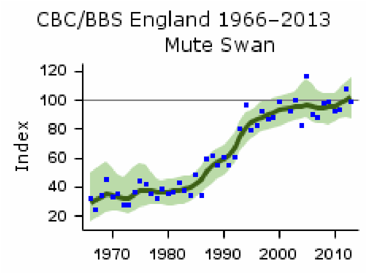
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	45	1967-2012	114	254	57	666		
	25	1987-2012	190	111	68	192		
	10	2002-2012	294	4	-8	19		
	5	2007-2012	327	14	2	28		
CBC/BBS England	45	1967-2012	97	220	66	554		Small CBC sample
	25	1987-2012	162	98	51	176		
	10	2002-2012	250	5	-7	24		
	5	2007-2012	278	6	-6	16		
WBS/WBBS waterways	37	1975-2012	80	79	18	141		
	25	1987-2012	101	53	13	96		
	10	2002-2012	142	-6	-26	13		
	5	2007-2012	126	-11	-25	6		
BBS UK	17	1995-2012	254	29	6	58		
	10	2002-2012	294	4	-11	16		
	5	2007-2012	327	13	2	29		
BBS England	17	1995-2012	217	15	-5	41		
	10	2002-2012	250	5	-7	20		
	5	2007-2012	278	6	-10	17		

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

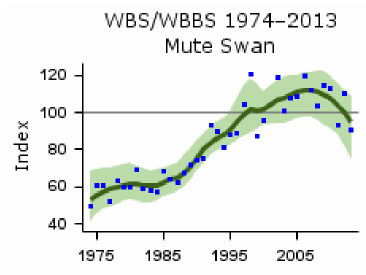
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



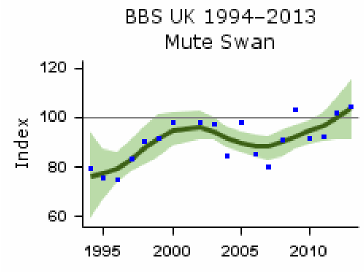
CBC/BBS UK graph



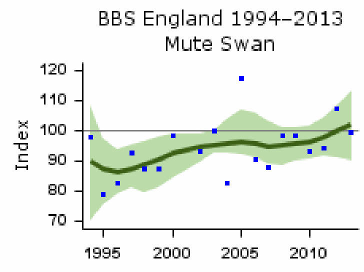
CBC/BBS England graph



WBS/WBBS waterways graph

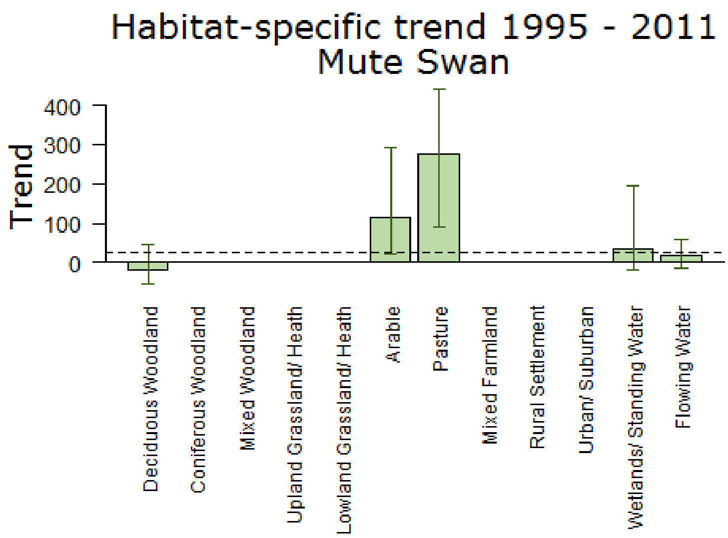


BBS UK graph



BBS England graph

Population trends by habitat



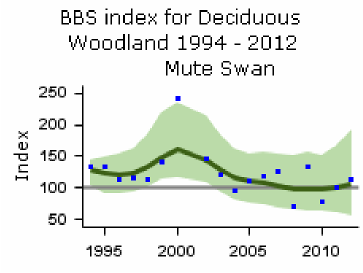
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

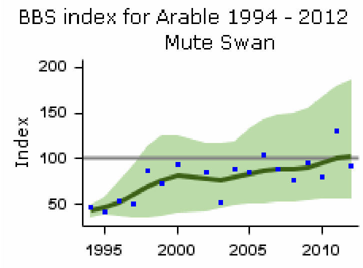
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	30	-20	-53	44
Arable	16	1995-2011	30	114	20	293
Pasture	16	1995-2011	58	274	91	440
Wetlands/ Standing Water	16	1995-2011	40	34	-17	195
Flowing Water	16	1995-2011	97	19	-14	60

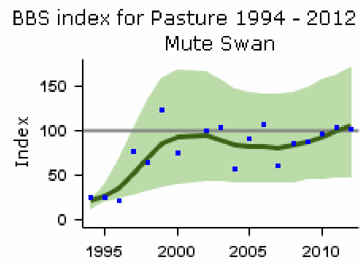
Further information on habitat-specific trends, please follow link here.



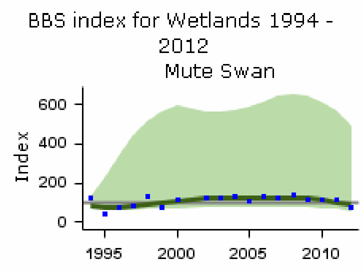
Habitat graph



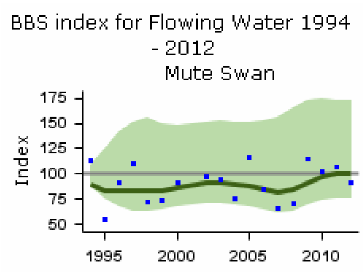
Habitat graph



Habitat graph

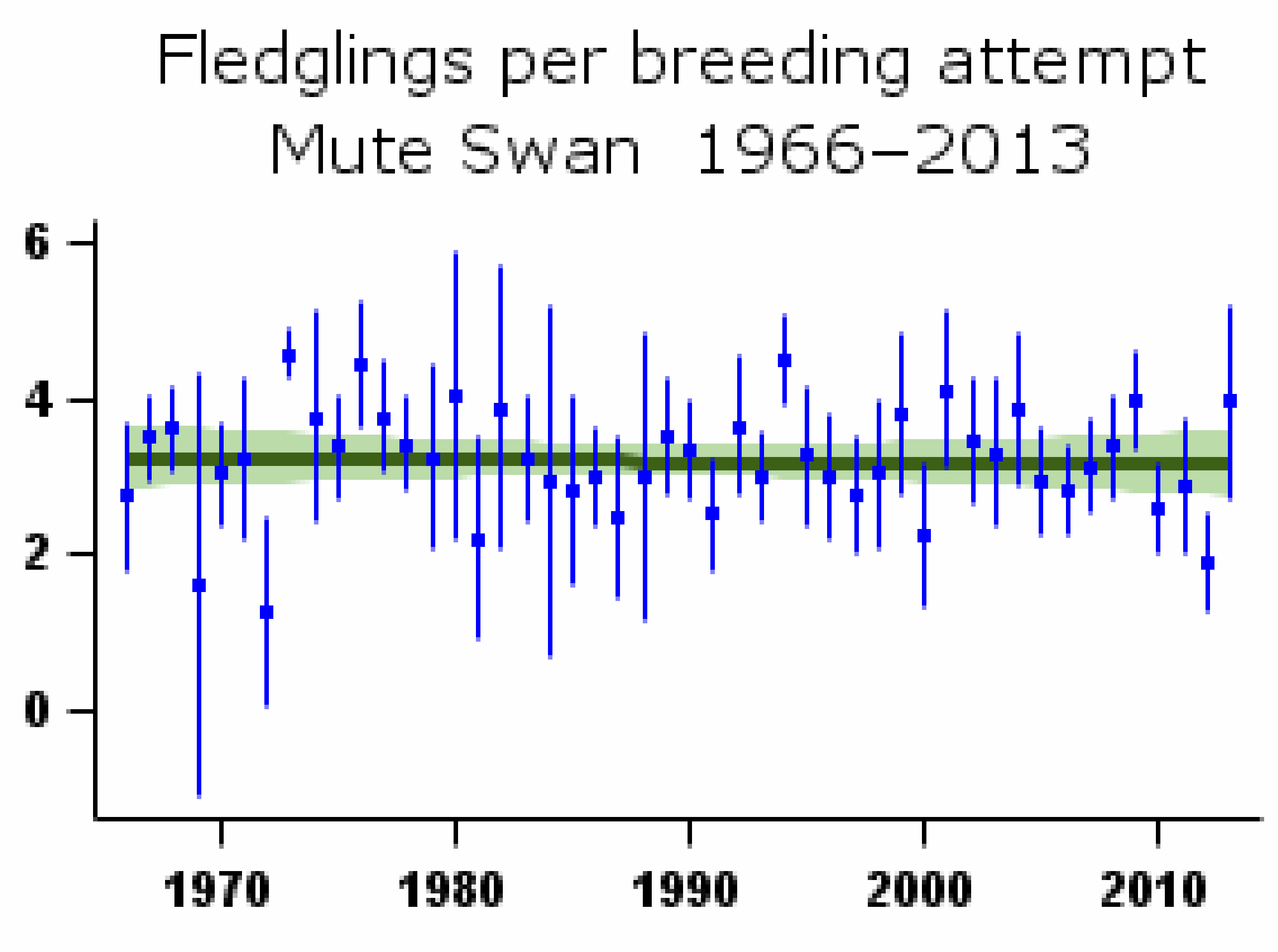


Habitat graph

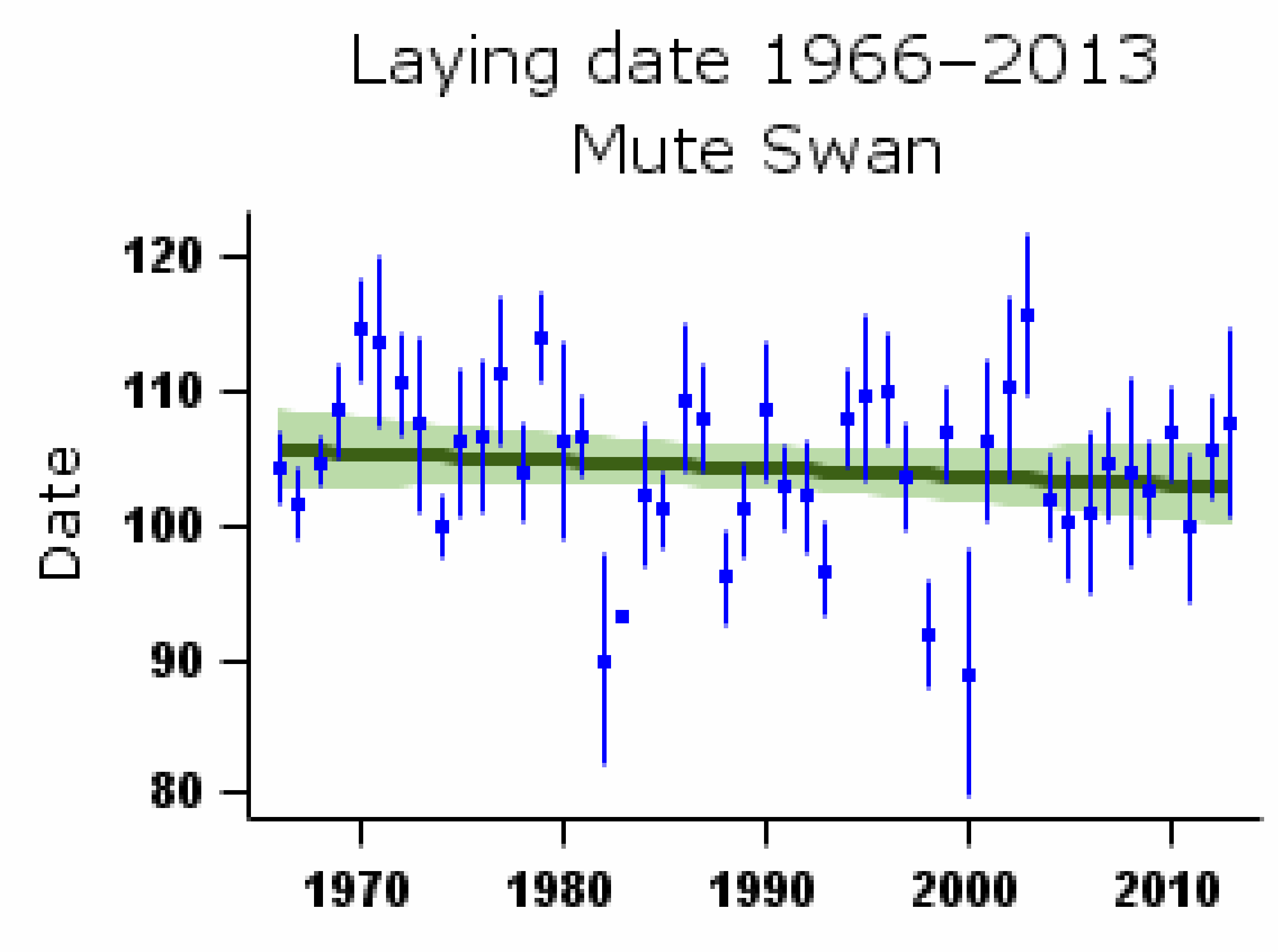


Habitat graph

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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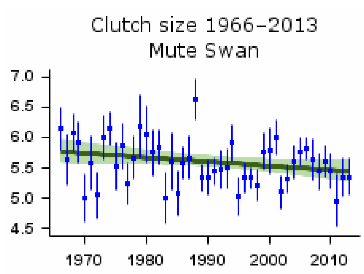
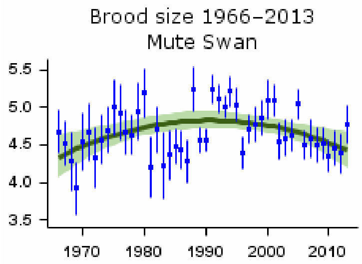
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	33	None					
Clutch size	44	1968-2012	32	None					
Brood size	44	1968-2012	67	Curvilinear	4.42 chicks	4.47 chicks	1.2%		
Nest failure rate at egg stage	44	1968-2012	37	None					
Nest failure rate at chick stage	44	1968-2012	42	None					
Laying date	44	1968-2012	17	None			0 days		Small sample

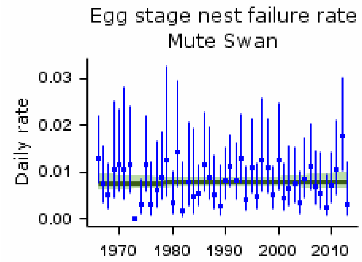
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



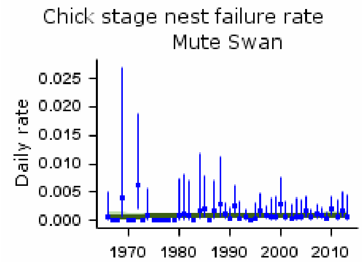
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Greylag Goose

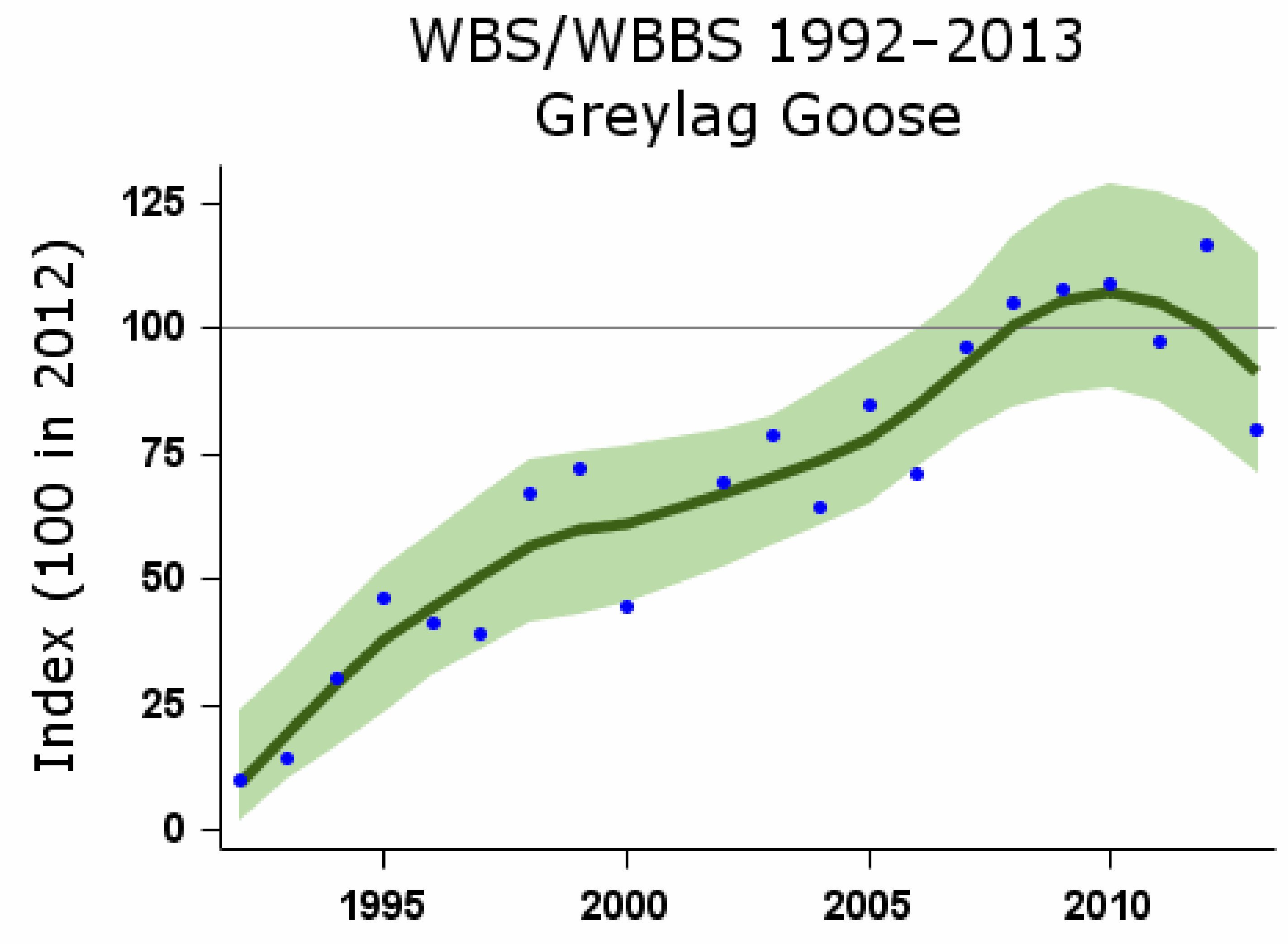
Anser anser

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 (Austin et al. 2014).



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

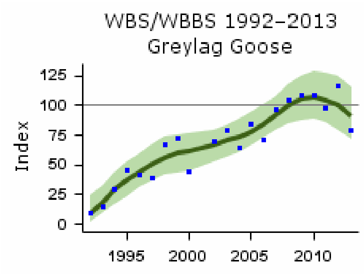
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
WBS/WBBS waterways	19	1993-2012	41	418	129	1153		
	10	2002-2012	59	49	-3	162		
	5	2007-2012	60	7	-21	32		

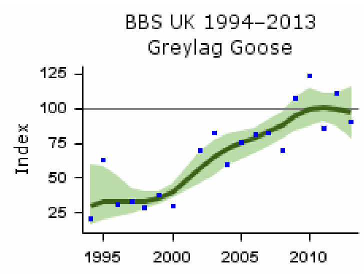
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	17	1995-2012	200	203	37	481		
	10	2002-2012	261	74	33	120		
	5	2007-2012	332	20	0	53		
BBS England	17	1995-2012	166	278	168	534		
	10	2002-2012	219	108	65	161		
	5	2007-2012	280	46	24	73		

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

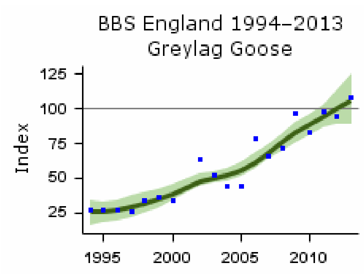
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Canada Goose

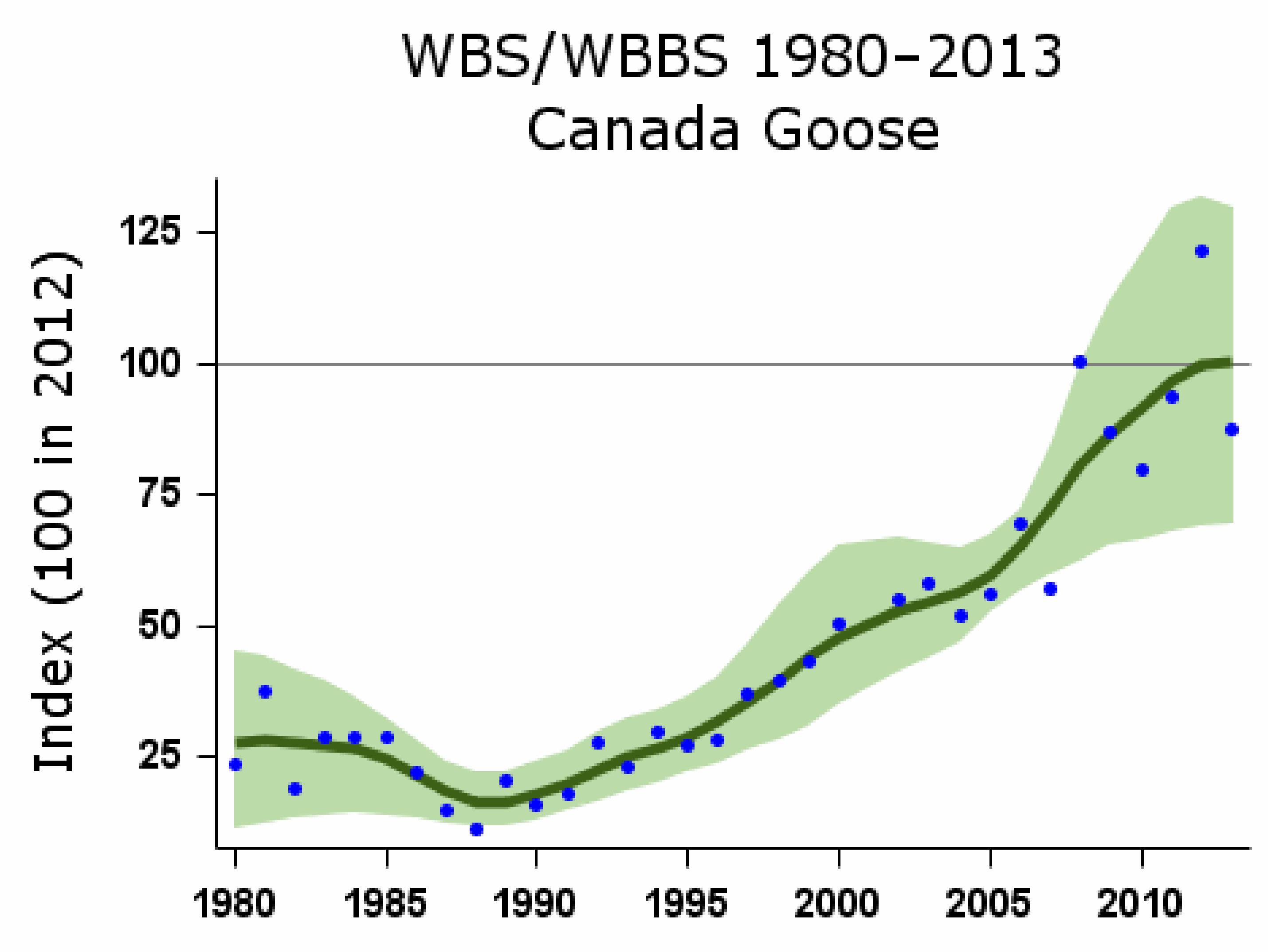
Branta canadensis

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 exponential 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 but with significant reversals over the last five years. Winter monitoring by WeBS shows a strong long-term increase, but with little change since about 2001 (Austin et al. 2014). 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

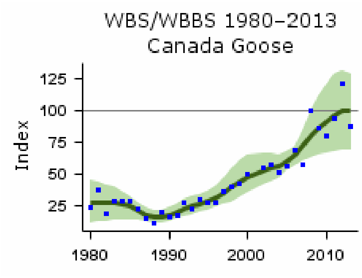
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
WBS/WBBS waterways	31	1981-2012	67	255	55	1054		
	25	1987-2012	78	446	188	996		
	10	2002-2012	120	88	7	227		

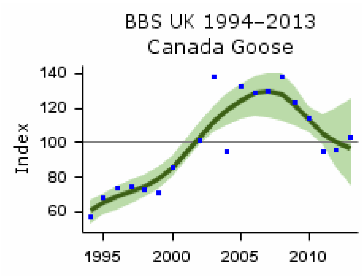
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	5	2007-2012	115	38	4	70		
BBS UK	17	1995-2012	486	54	27	98		
	10	2002-2012	581	-3	-21	21		
	5	2007-2012	653	-23	-40	7		
BBS England	17	1995-2012	451	34	7	72		
	10	2002-2012	536	-12	-29	6		
	5	2007-2012	602	-30	-45	-5	>25	

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

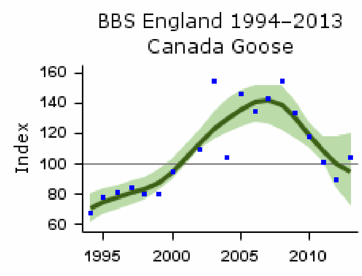
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



WBS/WBBS waterways graph

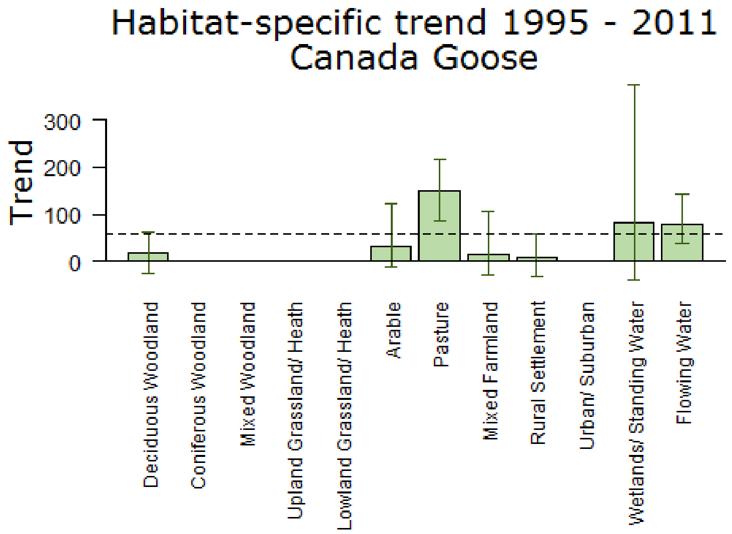


BBS UK graph



BBS England graph

Population trends by habitat



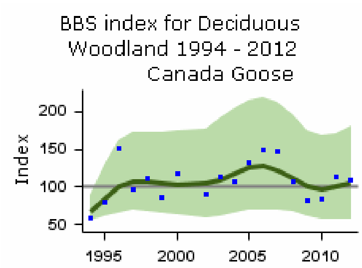
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

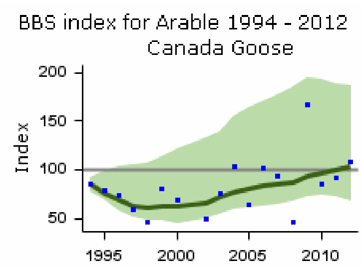
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	47	18	-25	63
Arable	16	1995-2011	33	32	-12	122
Pasture	16	1995-2011	111	148	84	216
Mixed Farmland	16	1995-2011	36	15	-31	106
Rural Settlement	16	1995-2011	44	8	-34	57
Wetlands/ Standing Water	16	1995-2011	35	82	-39	375
Flowing Water	16	1995-2011	103	79	38	144

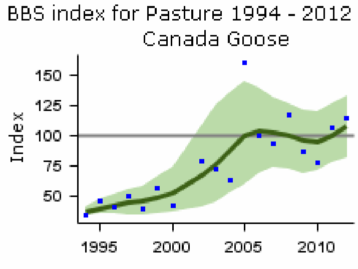
Further information on habitat-specific trends, please follow link here.



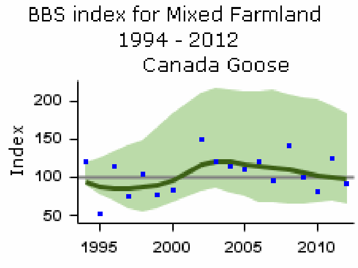
Habitat graph



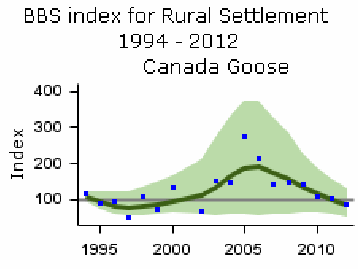
Habitat graph



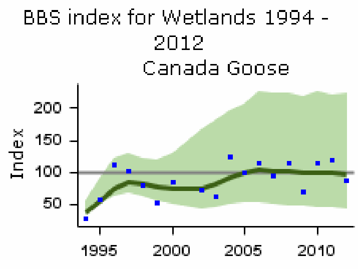
Habitat graph



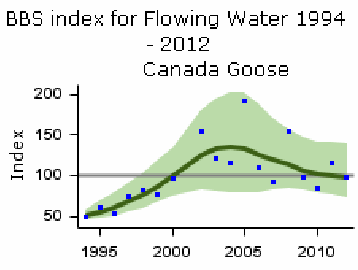
Habitat graph



Habitat graph



Habitat graph



Habitat 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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Shelduck

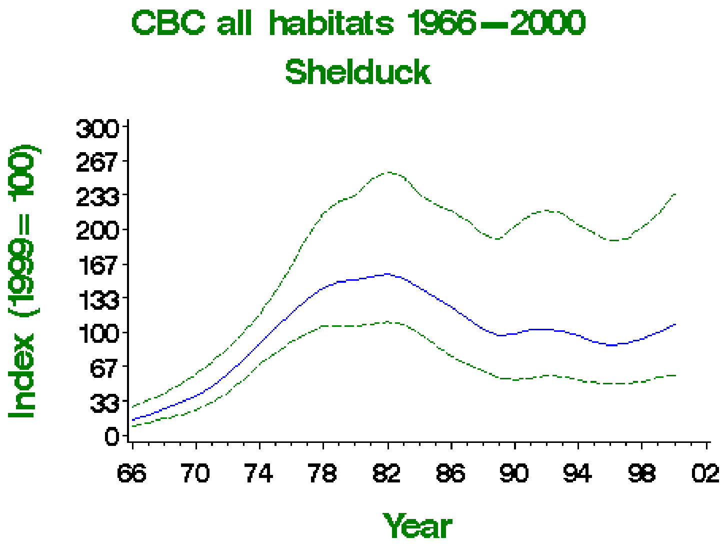
Tadorna tadorna

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 (Austin et al. 2014). 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, and there has been further expansion of breeding population (Balmer et al. 2013).



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	17	1995-2012	144	-10	-39	22		
	10	2002-2012	157	7	-14	21		
	5	2007-2012	167	-11	-20	0		
BBS England	17	1995-2012	118	19	-11	42		
	10	2002-2012	128	27	4	44		
	5	2007-2012	137	-7	-19	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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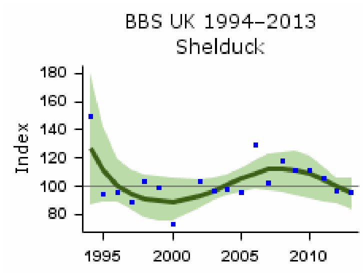
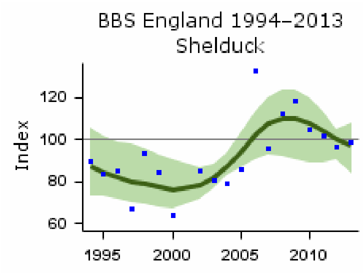
Smoothed population index, relative to an arbitrary 100 in 2009, with 85% confidence limits in green



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

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Demographic trends

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

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Gadwall

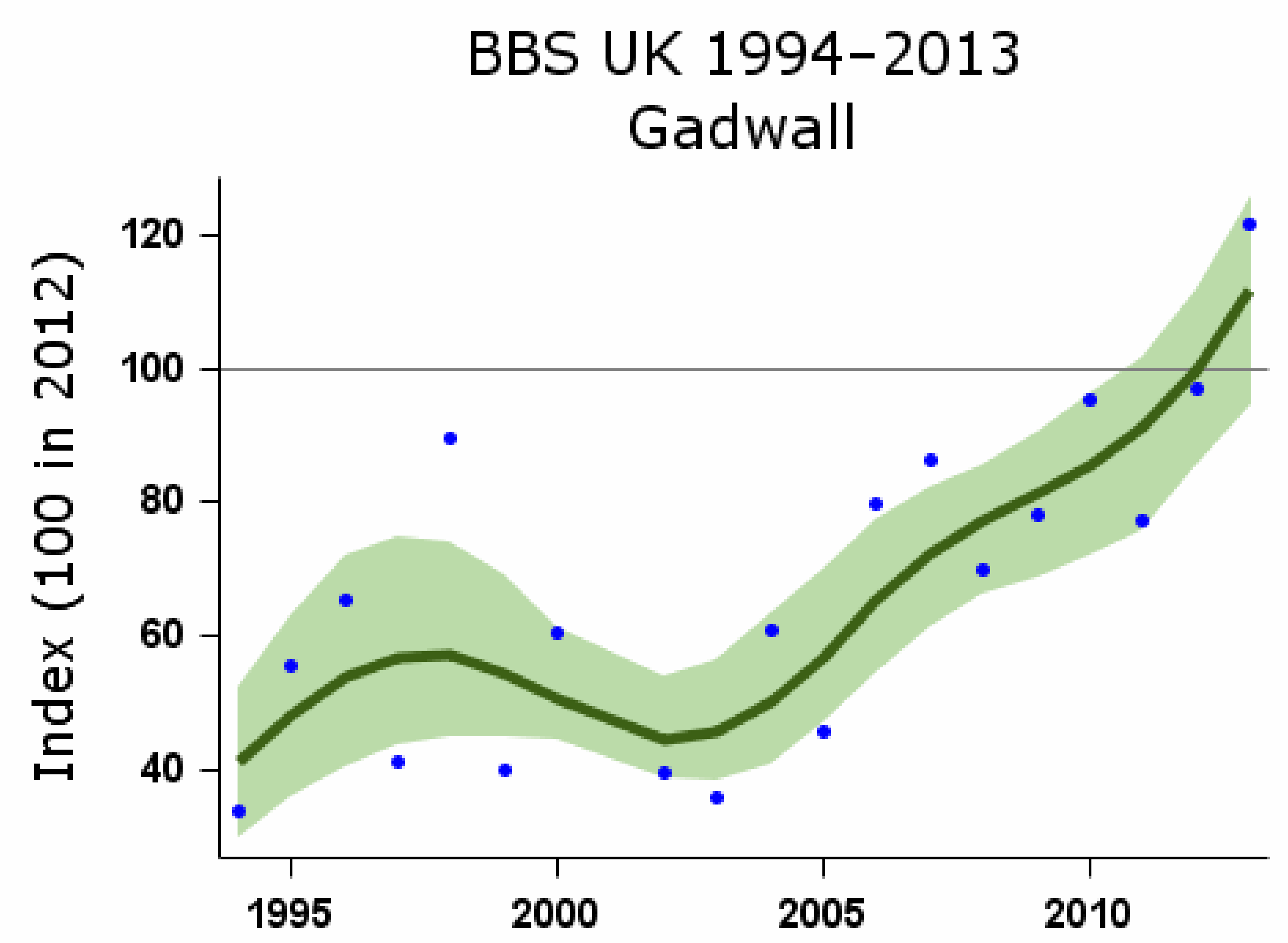
Mareca strepera

Key facts

Conservation listings:	Europe: SPEC category 3 (depleted) (BiE04) UK: amber (depleted in Europe, >20% European population in winter) (BoCC3)
Long-term trend:	UK, England: rapid increase
Population size:	690-1,730 pairs in 2006-09 (APEP13: RBBP data)

Status summary

Since wildfowlers released a wing-clipped pair of migrants in Norfolk in 1850, far from their native UK breeding distribution in Scotland, the breeding distribution of Gadwall has expanded and now covers much of lowland Britain, though with many gaps still in the west of the country (Balmer et al. 2013). Range expansion has been rapid since the 1950s. Numbers have recently surpassed the level where a BBS trend can be calculated: further strong increases are indicated and the population may even have redoubled over the latest 10-year period. Winter numbers, which include many continental visitors, are also rising strongly in England, Wales and Scotland but are fluctuating in Northern Ireland (Austin et al. 2014).



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

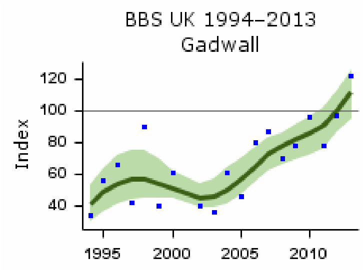
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	17	1995-2012	38	107	33	217		
	10	2002-2012	45	124	66	178		
	5	2007-2012	54	38	10	69		
BBS England	17	1995-2012	36	107	36	231		

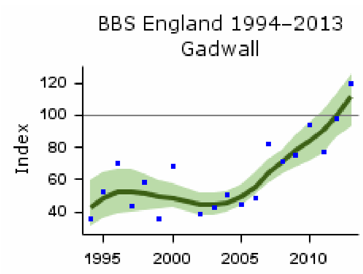
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	10	2002-2012	43	125	68	186		
	5	2007-2012	52	56	23	87		

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



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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Mallard

Anas platyrhynchos

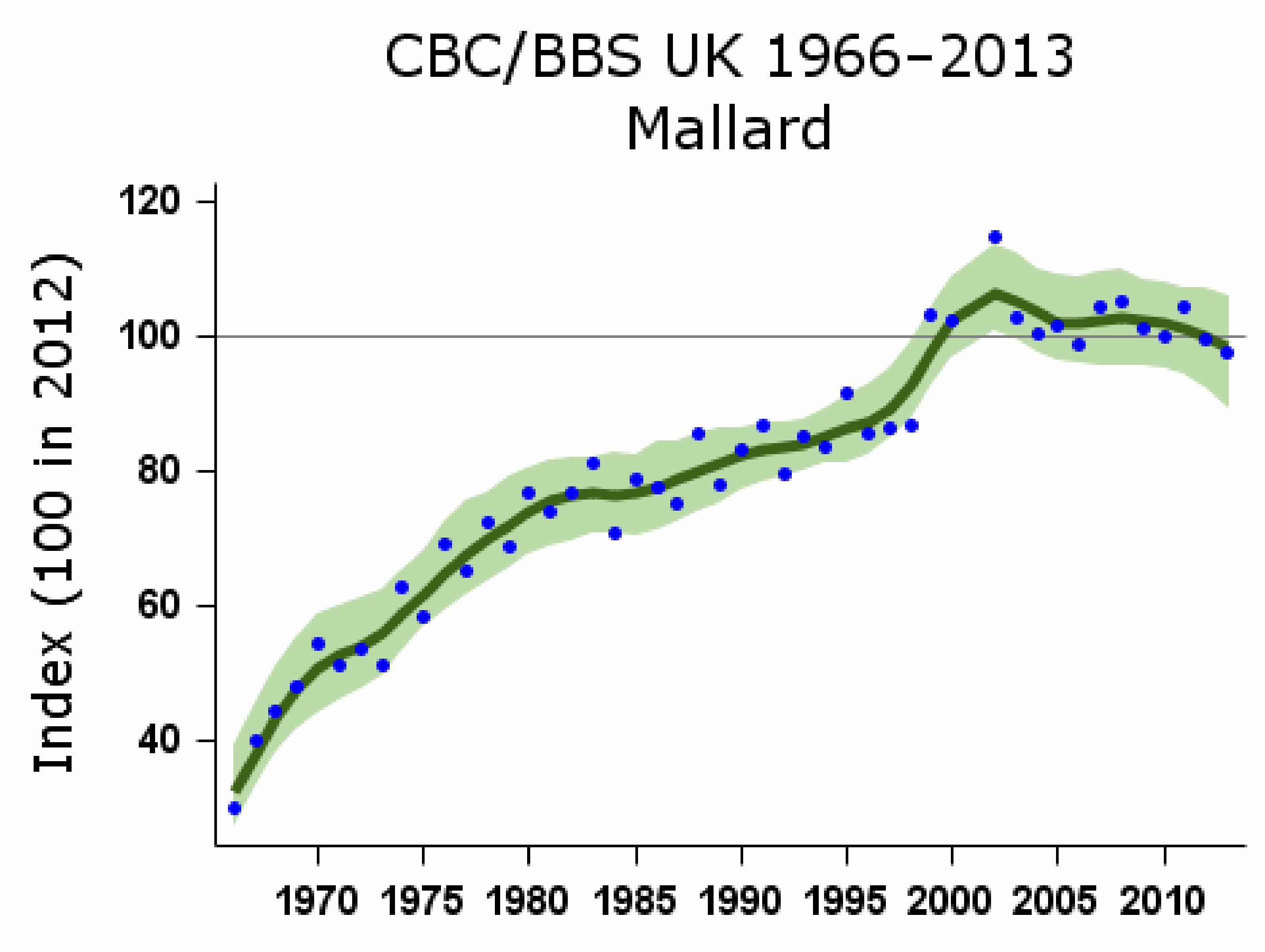
Key facts

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 Austin et al. 2014). 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 though the trend since 1990 has been stable (PECBMS 2014a).



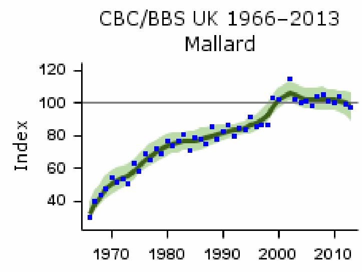
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

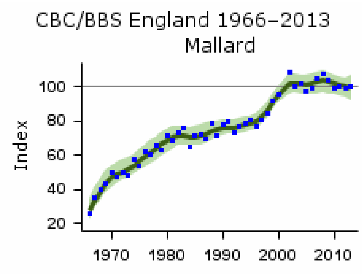
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	45	1967-2012	596	163	102	220		
	25	1987-2012	983	27	10	46		
	10	2002-2012	1505	-6	-12	-1		
	5	2007-2012	1677	-2	-8	4		
CBC/BBS England	45	1967-2012	503	202	136	262		
	25	1987-2012	828	38	19	57		
	10	2002-2012	1272	-2	-8	4		
	5	2007-2012	1424	-3	-8	2		
WBS/WBBS waterways	37	1975-2012	166	205	135	288		
	25	1987-2012	205	78	43	120		
	10	2002-2012	291	-1	-9	5		
	5	2007-2012	260	-1	-8	4		
BBS UK	17	1995-2012	1318	17	8	27		
	10	2002-2012	1505	-5	-11	1		
	5	2007-2012	1677	-2	-7	3		
BBS England	17	1995-2012	1109	28	18	38		
	10	2002-2012	1272	-1	-7	5		
	5	2007-2012	1424	-3	-8	2		
BBS Scotland	17	1995-2012	105	-14	-27	5		
	10	2002-2012	113	-25	-38	-11		
	5	2007-2012	128	1	-17	25		
BBS Wales	17	1995-2012	67	-17	-48	40		
	10	2002-2012	75	31	-8	89		
	5	2007-2012	75	-14	-27	5		

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

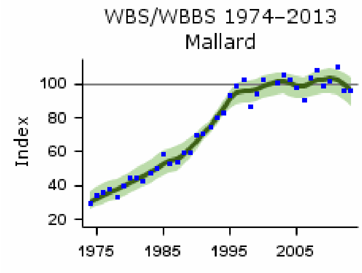
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



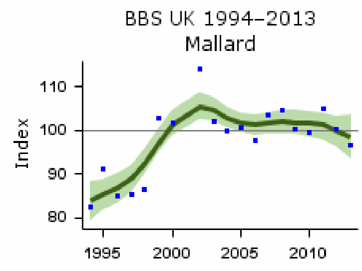
CBC/BBS UK graph



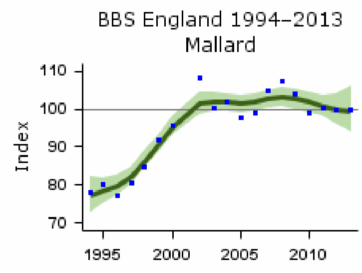
CBC/BBS England graph



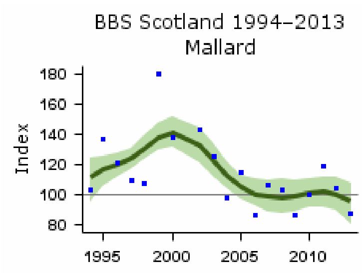
WBS/WBBS waterways graph



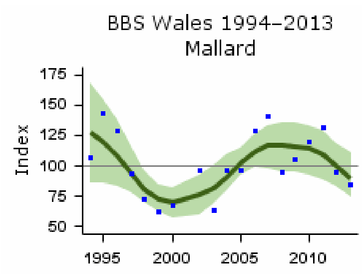
BBS UK graph



BBS England graph

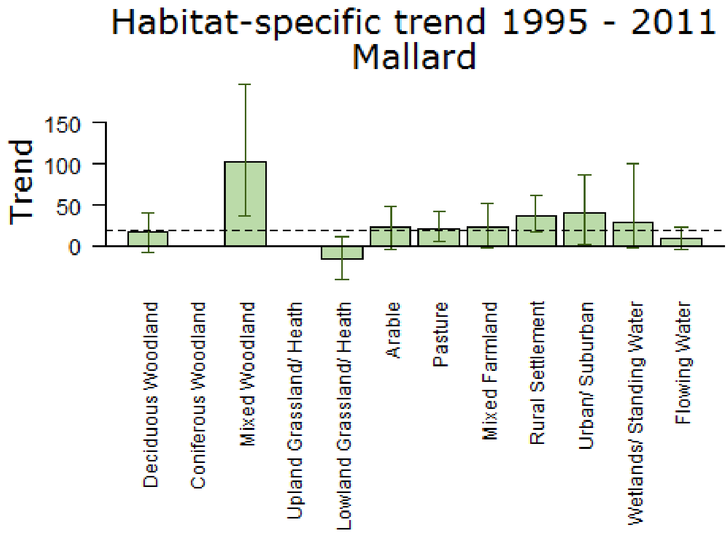


BBS Scotland graph



BBS Wales graph

Population trends by habitat



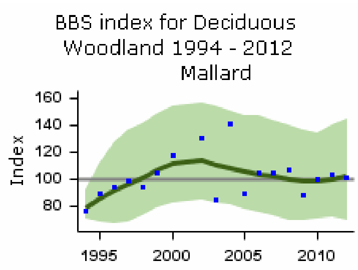
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

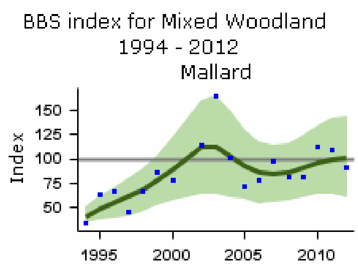
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	163	17	-8	40
Mixed Woodland	16	1995-2011	72	102	38	197
Lowland Grassland/ Heath	16	1995-2011	35	-15	-40	12
Arable	16	1995-2011	184	23	-3	48
Pasture	16	1995-2011	386	21	5	42
Mixed Farmland	16	1995-2011	147	23	-2	53
Rural Settlement	16	1995-2011	180	36	18	63
Urban/ Suburban	16	1995-2011	106	40	3	87
Wetlands/ Standing Water	16	1995-2011	89	29	-2	101
Flowing Water	16	1995-2011	354	10	-3	23

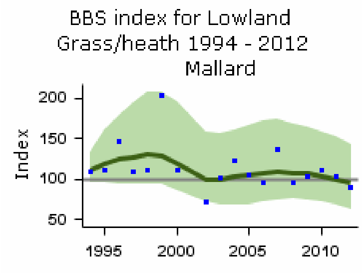
Further information on habitat-specific trends, please follow link here.



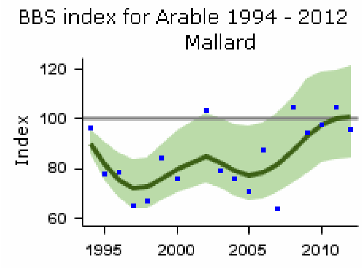
Habitat graph



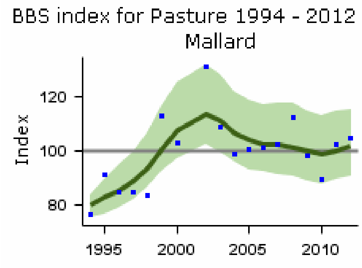
Habitat graph



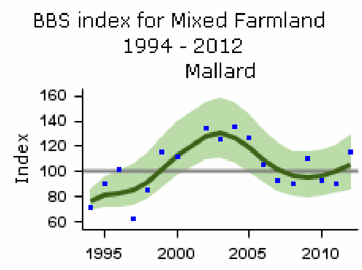
Habitat graph



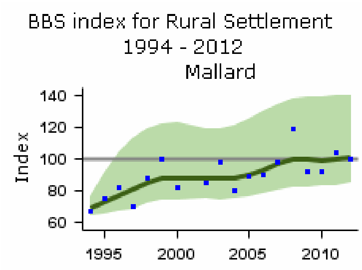
Habitat graph



Habitat graph



Habitat graph



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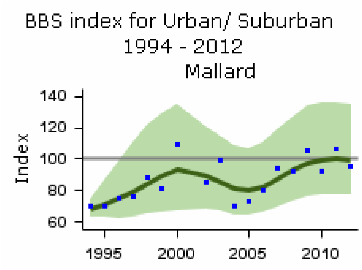

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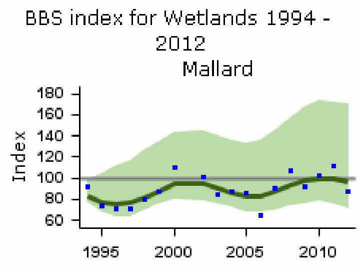
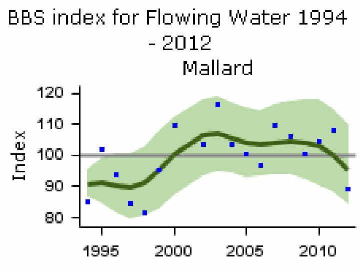


Habitat graph



Habitat 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 might 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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Tufted Duck

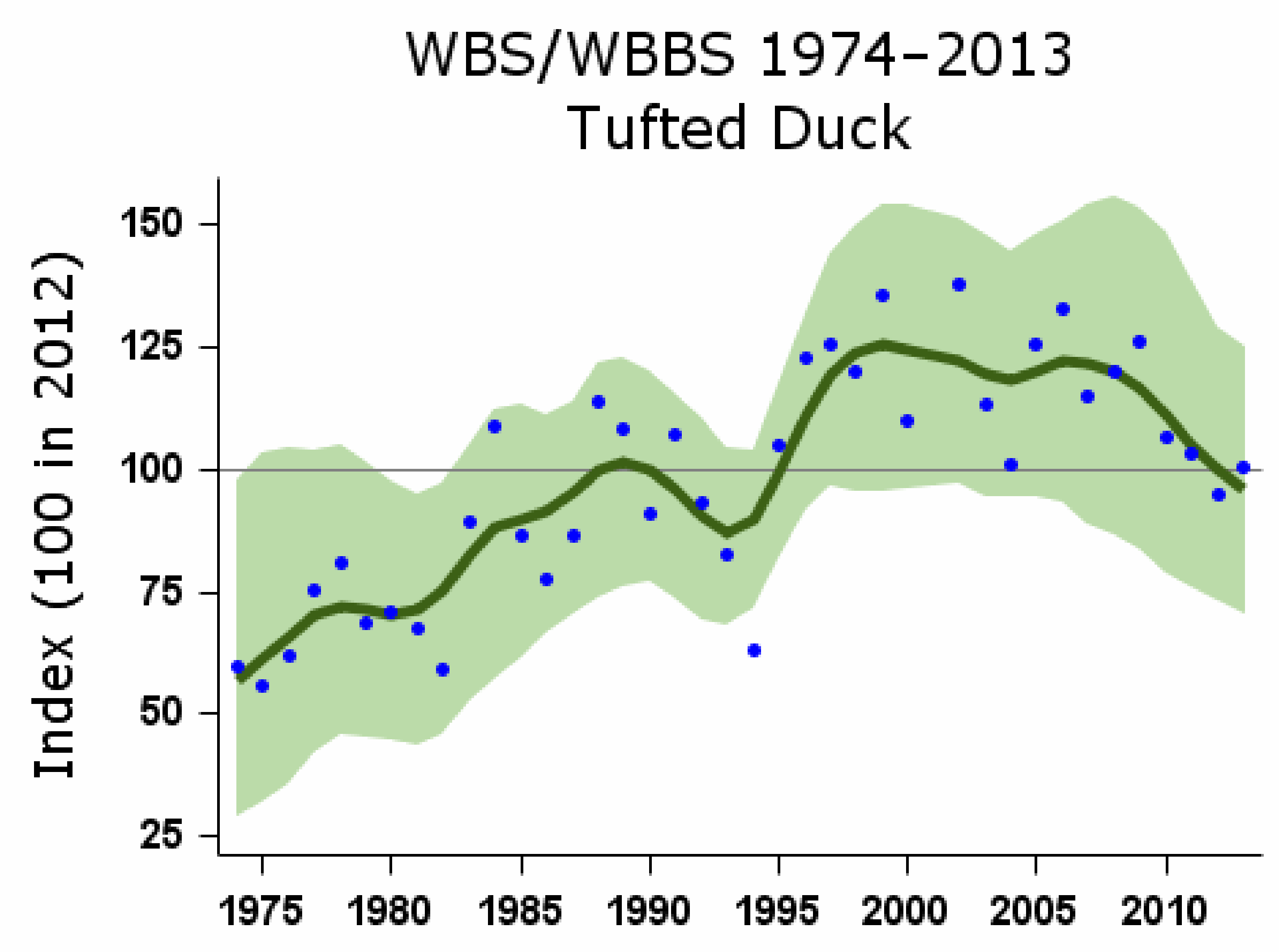
Aythya fuligula

Key facts

Conservation listings:	Europe: SPEC category 3 (declining) (BiE04) UK: amber (European decline) (BoCC3)
Long-term trend:	UK waterways: moderate 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 increase in range in Britain between the three atlas periods (Gibbons et al. 1993, Balmer et al. 2013) 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 (Austin et al. 2014). 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

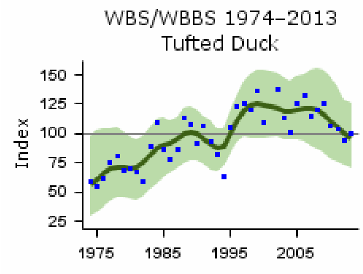
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
WBS/WBBS waterways	37	1975-2012	37	64	-32	303		
	25	1987-2012	44	5	-36	97		
	10	2002-2012	57	-18	-42	15		
	5	2007-2012	50	-18	-34	0		

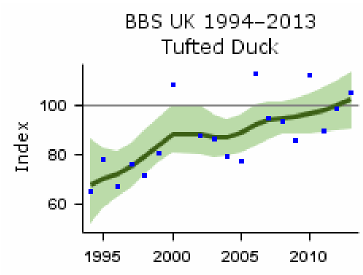
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	17	1995-2012	155	42	8	80		
	10	2002-2012	169	13	-7	36		
	5	2007-2012	189	6	-8	23		
BBS England	17	1995-2012	135	36	6	68		
	10	2002-2012	148	18	0	39		
	5	2007-2012	167	7	-5	21		

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

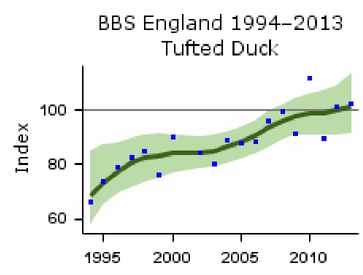
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



WBS/WBBS waterways graph

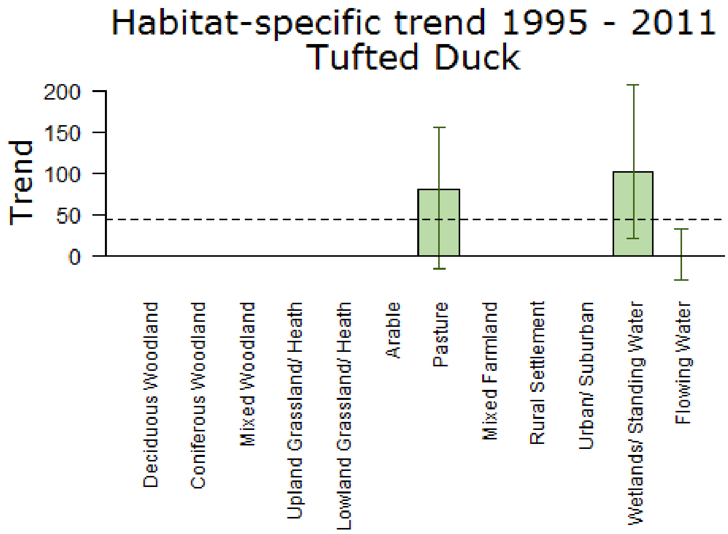


BBS UK graph



BBS England graph

Population trends by habitat



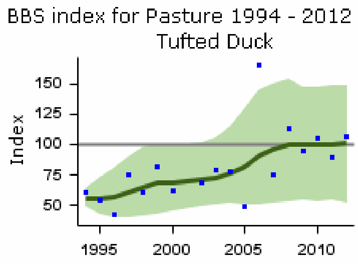
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

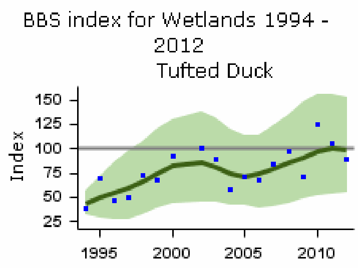
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Pasture	16	1995-2011	40	81	-16	156
Wetlands/ Standing Water	16	1995-2011	32	102	20	207
Flowing Water	16	1995-2011	66	-1	-28	32

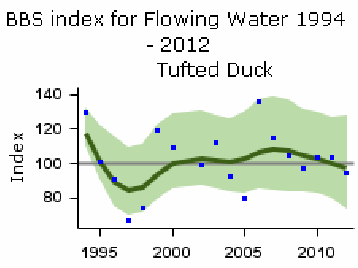
Further information on habitat-specific trends, please follow link here.



Habitat graph



Habitat graph



Habitat 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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Goosander

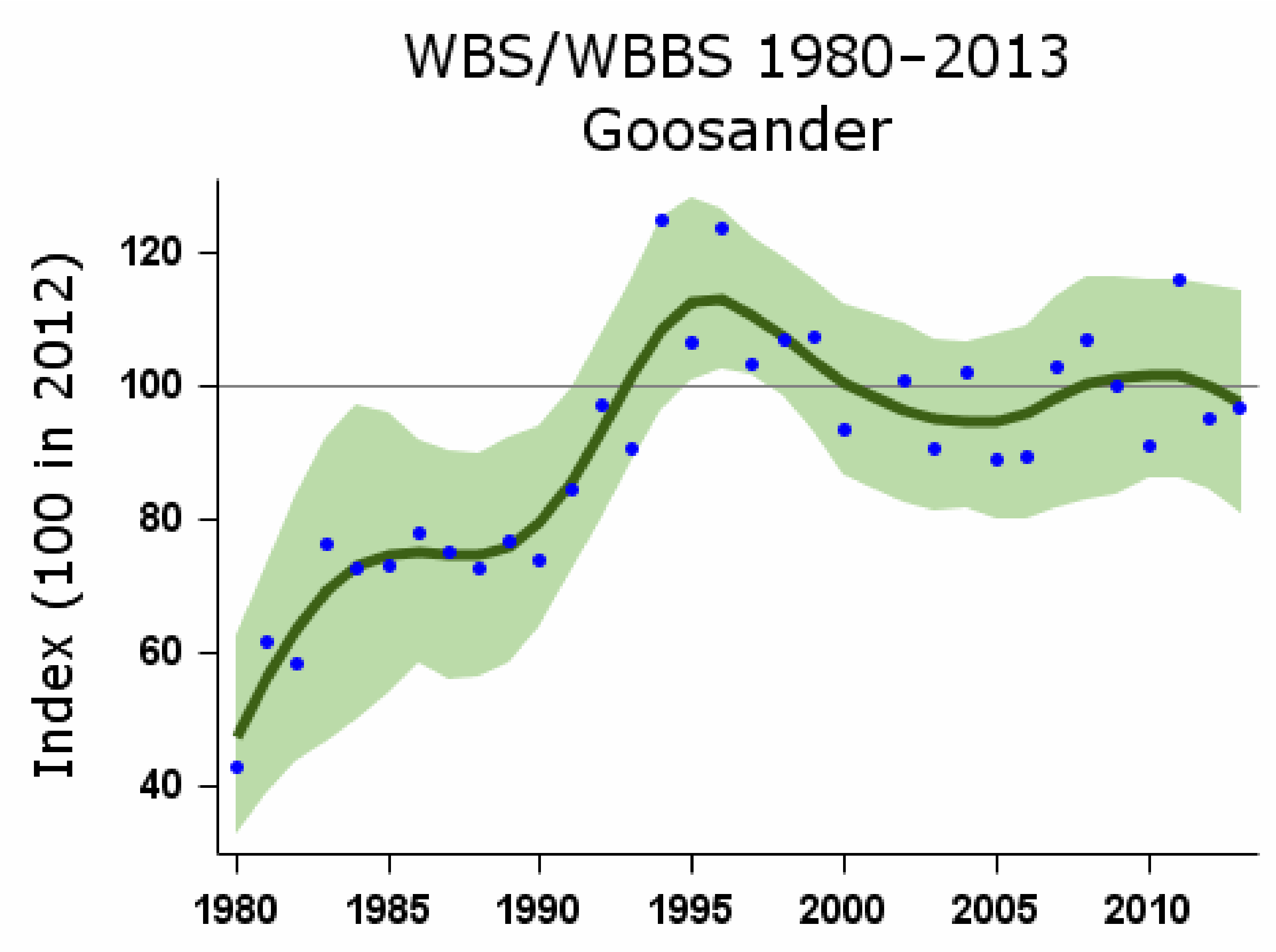
Mergus merganser

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 first 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). There has been considerable further range expansion since 1990 (Balmer et al. 2013). 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 (Austin et al. 2014).



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	31	1981-2012	42	78	14	196		
	25	1987-2012	48	34	-4	105		
	10	2002-2012	69	4	-12	23		

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	5	2007-2012	60	2	-13	24		
BBS UK	17	1995-2012	40	-6	-46	79		
	10	2002-2012	44	-8	-42	34		
	5	2007-2012	47	42	6	87		

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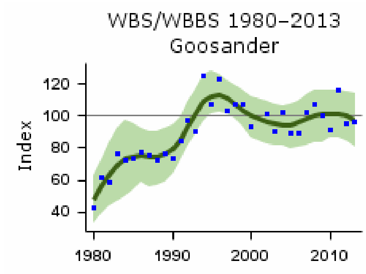
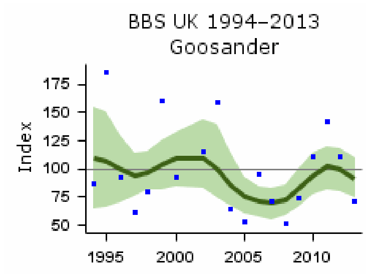


WBS/WBBS waterways graph



BBS UK 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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Red-legged Partridge

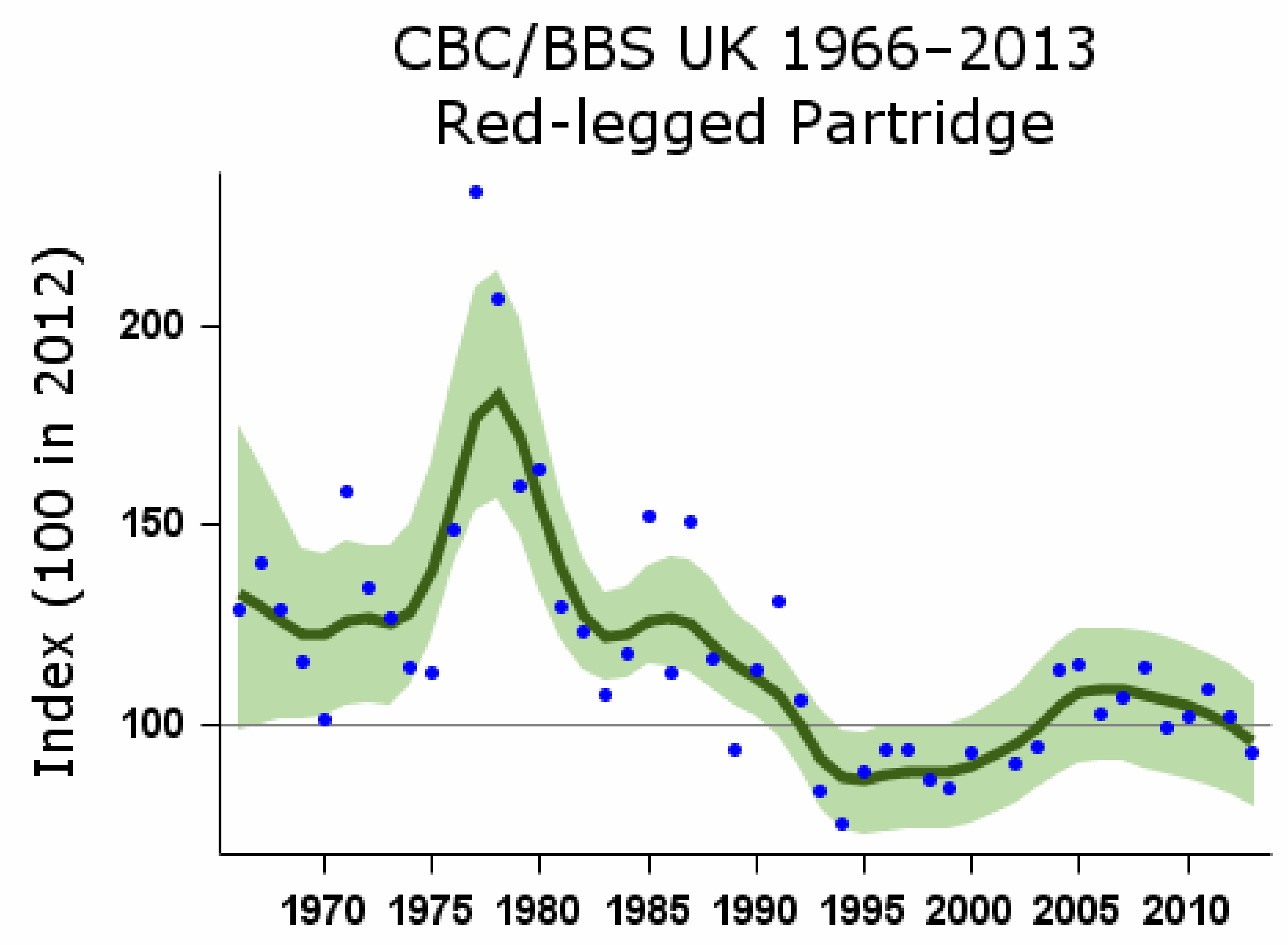
Alectoris rufa

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 releases of such vast scale of this species and Watson et al. 2007). Numbers have shown widespread moderate decline across Europe since 1998, but no longer-term trend is available (PECBMS 2014a).



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	45	1967-2012	244	-23	-50	13		
	25	1987-2012	412	-20	-37	-4		
	10	2002-2012	654	5	-3	13		
	5	2007-2012	736	-8	-14	-2		
CBC/BBS England	45	1967-2012	237	-26	-53	11		

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	25	1987-2012	401	-23	-40	-4		
	10	2002-2012	632	4	-3	12		
	5	2007-2012	706	-8	-12	-2		
BBS UK	17	1995-2012	563	19	8	31		
	10	2002-2012	654	5	-3	15		
	5	2007-2012	736	-8	-12	-2		
BBS England	17	1995-2012	547	13	4	23		
	10	2002-2012	632	4	-3	12		
	5	2007-2012	706	-8	-14	-3		

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

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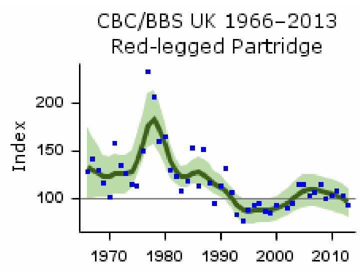
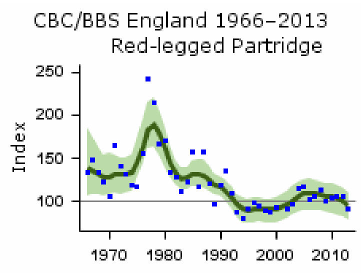
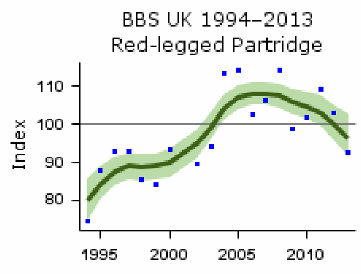


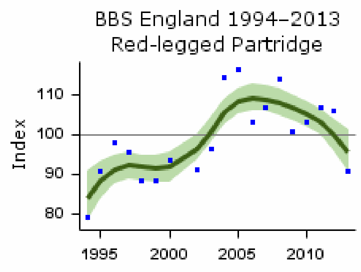
CBC/BBS UK graph



CBC/BBS England graph

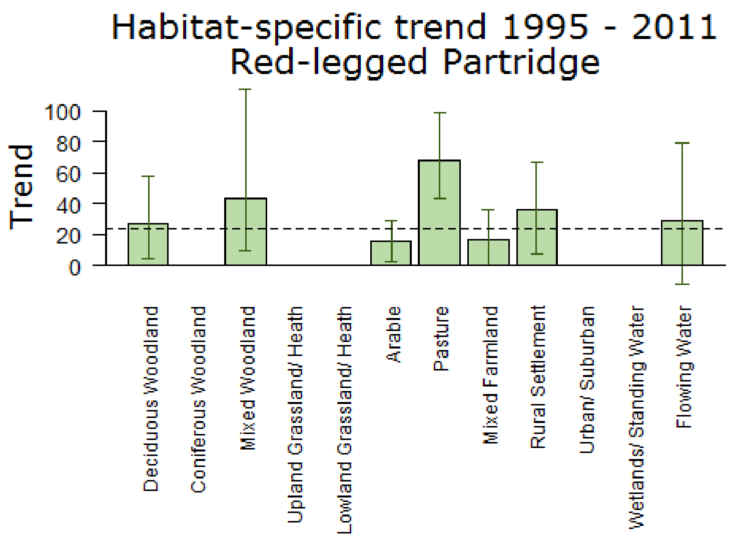


BBS UK graph



BBS England graph

Population trends by habitat



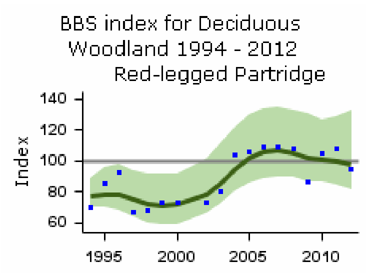
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

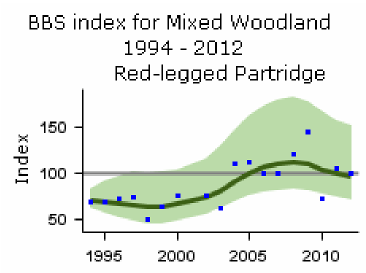
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	86	27	4	58
Mixed Woodland	16	1995-2011	40	43	9	114
Arable	16	1995-2011	264	16	3	30
Pasture	16	1995-2011	179	68	43	98
Mixed Farmland	16	1995-2011	158	17	1	37
Rural Settlement	16	1995-2011	102	37	7	67
Flowing Water	16	1995-2011	41	29	-12	79

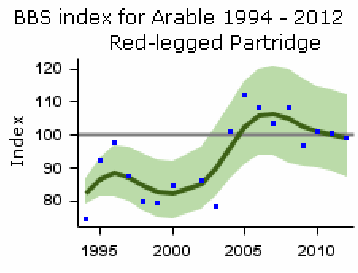
Further information on habitat-specific trends, please follow link here.



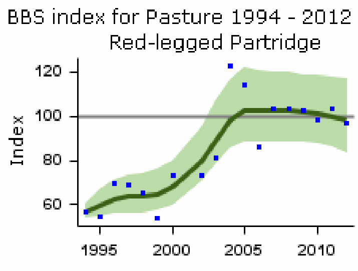
Habitat graph



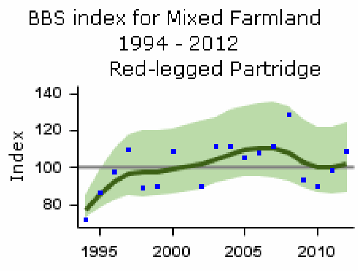
Habitat graph



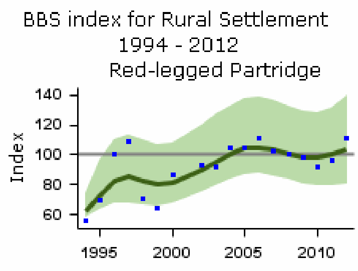
Habitat graph



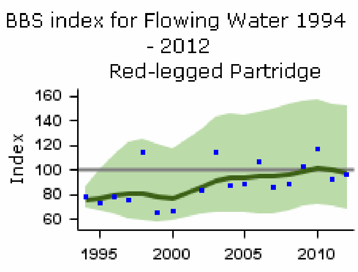
Habitat graph



Habitat graph



Habitat graph



Habitat 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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Red Grouse

Lagopus lagopus

Key facts

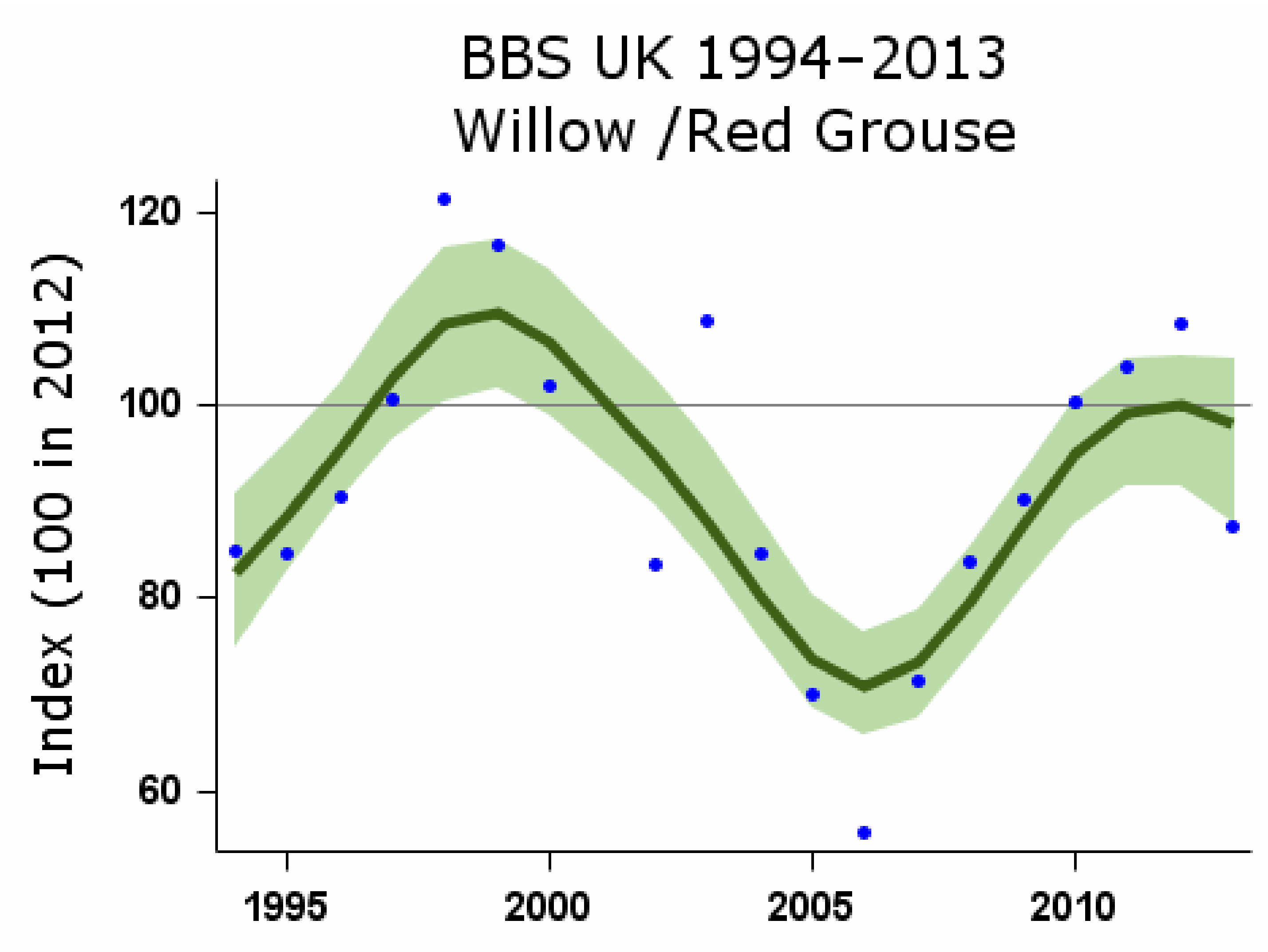
Conservation listings:	Europe: no SPEC category (favourable conservation status in Europe, not concentrated in Europe) (BiE04) UK: amber (25-50% population decline) (BoCC3) UK Biodiversity Action Plan: priority species
Long-term trend:	UK: decline
Population size:	230,000 pairs in 2009 (APEP13: 1988-91 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 significant 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 Trichostrongylus tenuis (Dobson & Hudson 1992, Gibbonset al. 1993) and to interrelated variations in the aggressiveness of males in autumn (Martinez-Padilla et al. 2014). Montane Fennoscandian populations also declined during 2002-12 (Lehikoinenet al. 2014).

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).

Laying dates in the Scottish Highlands advanced by about ten days between 1992 and 2011, and were inversely correlated with pre-laying temperatures, but no overall effect of climate change on chick survival could be identified (Fletcher et al. 2013).



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	17	1995-2012	143	13	-5	28		
	10	2002-2012	162	6	-13	18		
	5	2007-2012	203	37	21	47		
BBS England	17	1995-2012	85	7	-16	33		
	10	2002-2012	108	4	-12	21		
	5	2007-2012	145	50	33	57		
BBS Scotland	17	1995-2012	53	-6	-27	18		
	10	2002-2012	48	-12	-34	8		
	5	2007-2012	51	3	-18	27		

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

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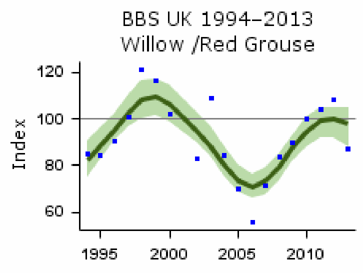
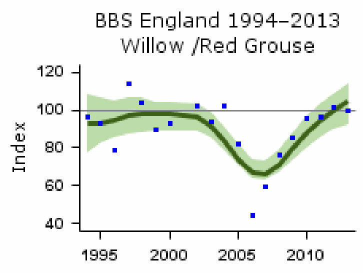
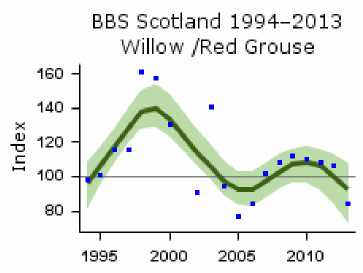


BBS UK graph



BBS England graph



BBS Scotland graph

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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Grey Partridge

Perdix perdix

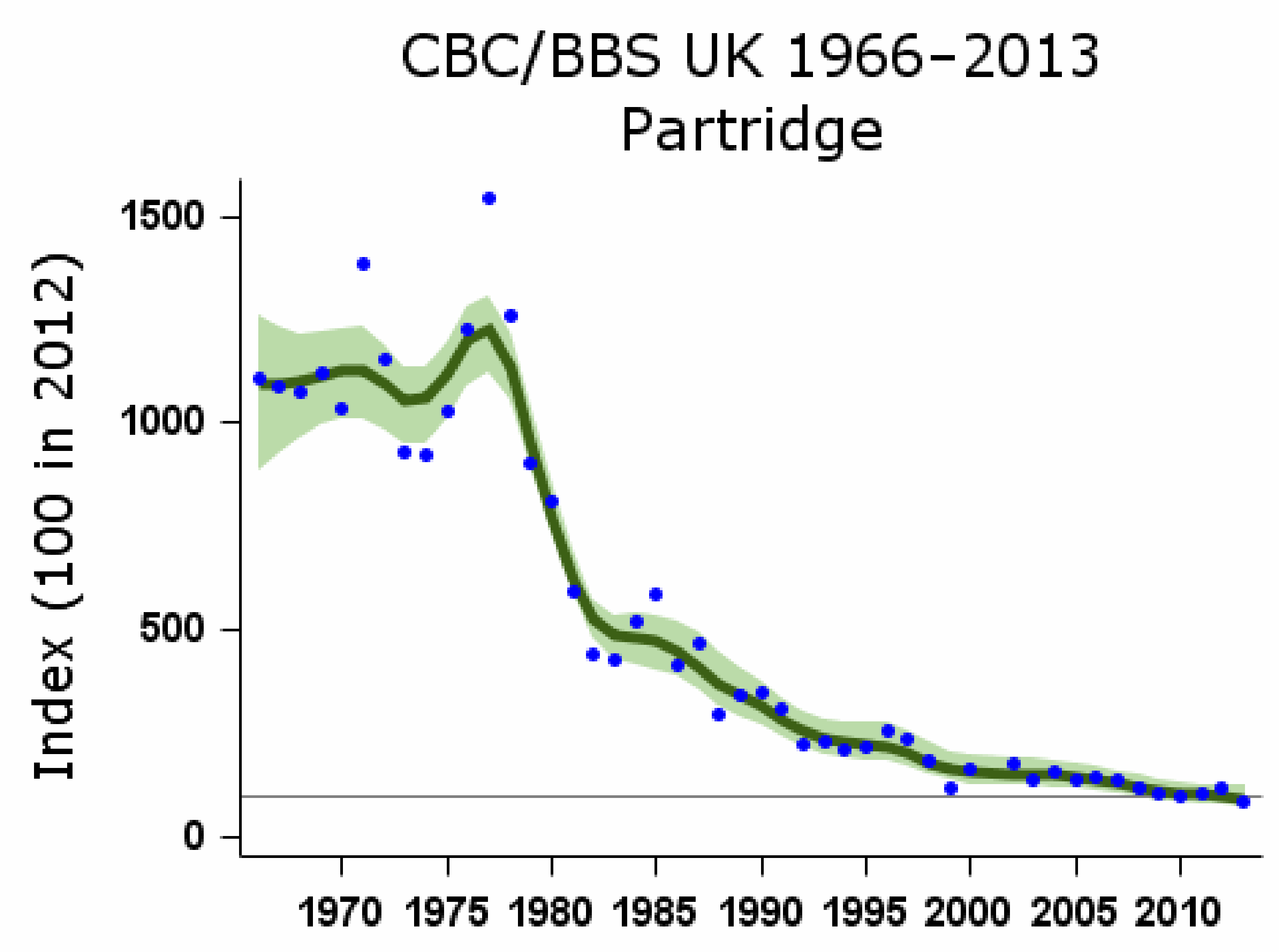
Key facts

Conservation listings:	Europe: SPEC category 3 (vulnerable) (BiE04) UK: red (>50% population decline) (BoCC3) UK Biodiversity Action Plan: 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, 2014a). Numbers can be increased within shooting estates where nesting habitat can be provided and pesticide use restricted, but at the expense of corvids, mustelids and foxes (Sotherton et al. 2014).



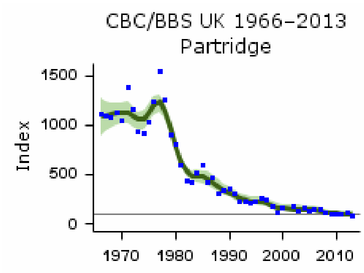
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

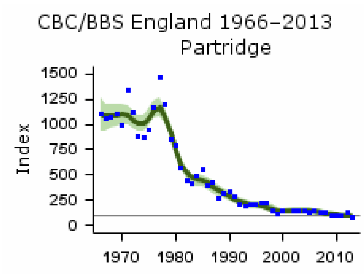
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	45	1967-2012	135	-91	-94	-87	>50	
	25	1987-2012	186	-76	-82	-69	>50	
	10	2002-2012	231	-36	-45	-25	>25	
	5	2007-2012	236	-24	-32	-12		
CBC/BBS England	45	1967-2012	121	-91	-94	-86	>50	
	25	1987-2012	167	-74	-79	-67	>50	
	10	2002-2012	210	-29	-37	-15	>25	
	5	2007-2012	214	-23	-31	-12		
BBS UK	17	1995-2012	231	-56	-62	-47	>50	
	10	2002-2012	231	-35	-43	-25	>25	
	5	2007-2012	236	-24	-33	-14		
BBS England	17	1995-2012	207	-52	-59	-43	>50	
	10	2002-2012	210	-29	-38	-16	>25	
	5	2007-2012	214	-23	-32	-13		

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

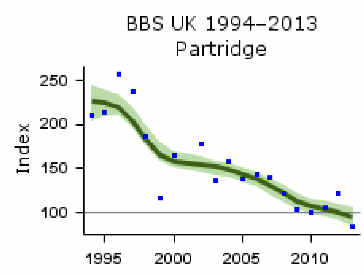
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



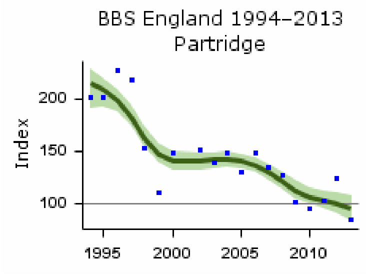
CBC/BBS UK graph



CBC/BBS England graph

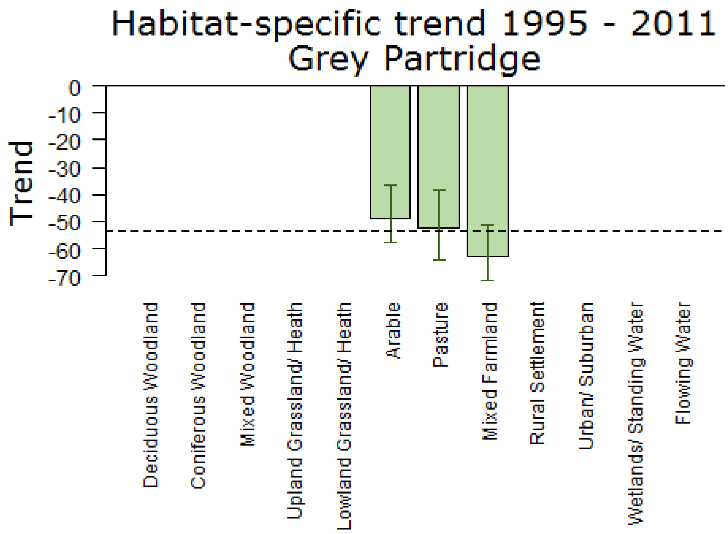


BBS UK graph



BBS England graph

Population trends by habitat



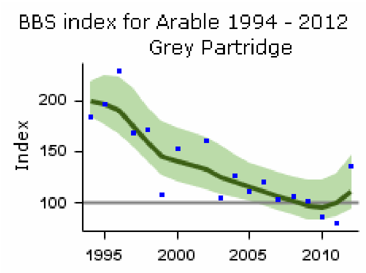
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

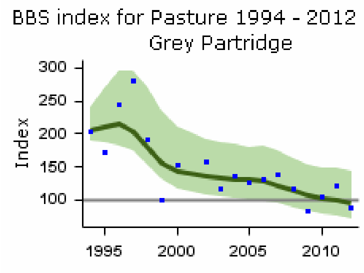
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Arable	16	1995-2011	91	-49	-58	-37
Pasture	16	1995-2011	68	-53	-64	-38
Mixed Farmland	16	1995-2011	51	-63	-71	-51

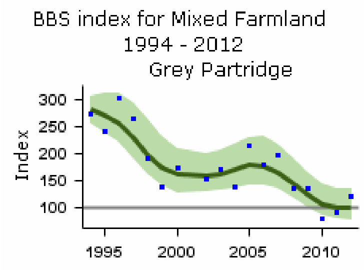
Further information on habitat-specific trends, please follow link here.



Habitat graph



Habitat graph



Habitat 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 2012). Potts (1980, 2012) 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 than in 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 the failure of hunters 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 Tompkinset 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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Pheasant

Phasianus colchicus

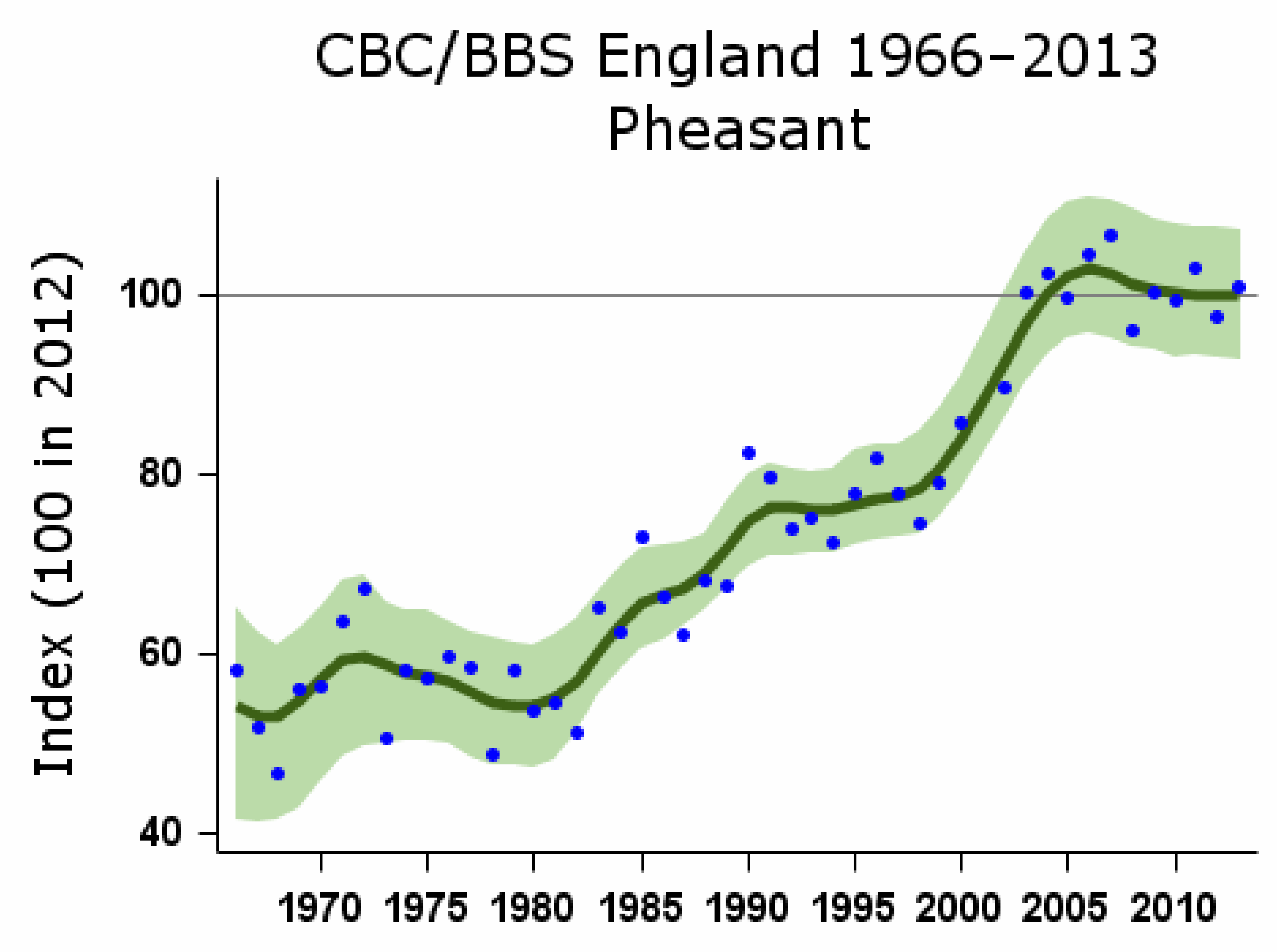
Key facts

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 steeply in abundance since the 1960s. 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). The increase has been fuelled by a concurrent steep rise in the numbers of Pheasants released onto shooting estates (PECBMS 2014a).



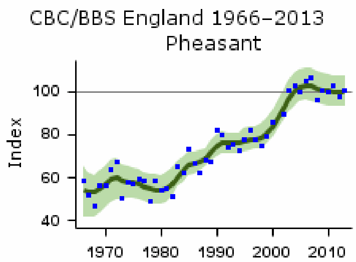
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

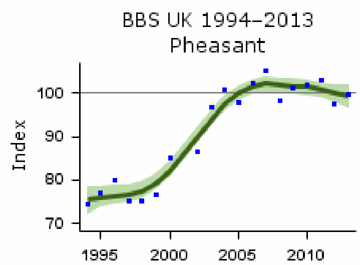
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	45	1967-2012	687	88	51	171		
	25	1987-2012	1155	48	30	70		
	10	2002-2012	1799	8	3	13		
	5	2007-2012	2044	-3	-5	0		
BBS UK	17	1995-2012	1840	32	25	38		
	10	2002-2012	2135	11	7	15		
	5	2007-2012	2424	-2	-5	1		
BBS England	17	1995-2012	1553	32	24	39		
	10	2002-2012	1799	8	3	12		
	5	2007-2012	2044	-3	-6	0		
BBS Scotland	17	1995-2012	141	18	0	37		
	10	2002-2012	161	22	5	41		
	5	2007-2012	191	1	-11	10		
BBS Wales	17	1995-2012	93	35	11	71		
	10	2002-2012	109	13	-4	29		
	5	2007-2012	114	-11	-18	-2		
BBS N.Ireland	17	1995-2012	42	124	28	201		
	10	2002-2012	52	28	4	61		
	5	2007-2012	62	-10	-22	8		

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

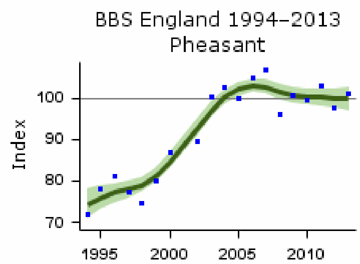
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



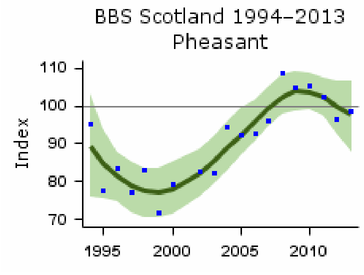
CBC/BBS England graph



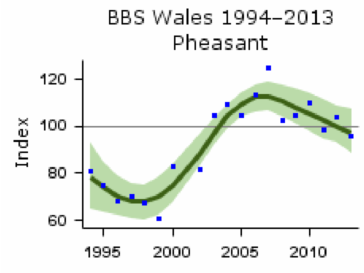
BBS UK graph



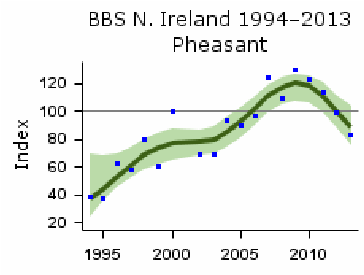
BBS England graph



BBS Scotland graph

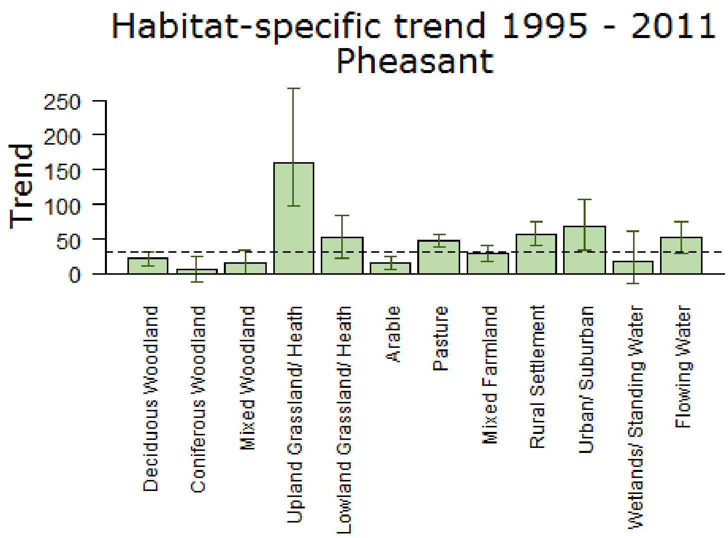


BBS Wales graph



BBS N.Ireland graph

Population trends by habitat



Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

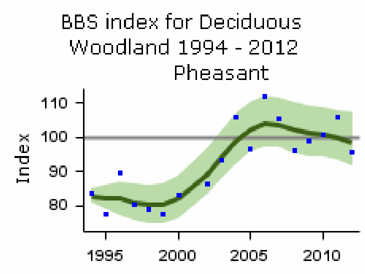
Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

More on habitat trends

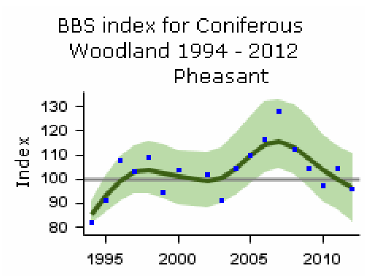
Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	564	22	11	31

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Coniferous Woodland	16	1995-2011	123	8	-12	25
Mixed Woodland	16	1995-2011	318	15	0	34
Upland Grassland/ Heath	16	1995-2011	34	160	97	267
Lowland Grassland/ Heath	16	1995-2011	104	51	22	85
Arable	16	1995-2011	659	15	8	24
Pasture	16	1995-2011	961	49	39	58
Mixed Farmland	16	1995-2011	553	31	19	41
Rural Settlement	16	1995-2011	493	57	40	76
Urban/ Suburban	16	1995-2011	77	68	35	108
Wetlands/ Standing Water	16	1995-2011	51	18	-13	62
Flowing Water	16	1995-2011	287	52	29	74

Further information on habitat-specific trends, please follow link here.



Habitat graph



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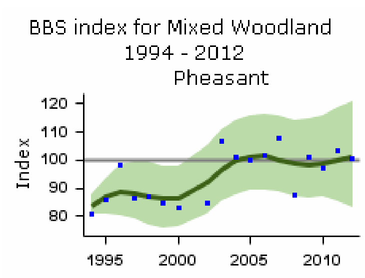

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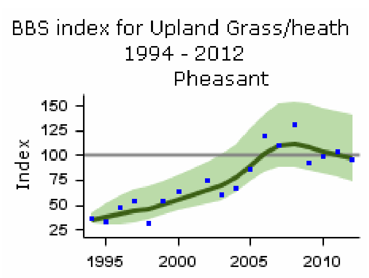

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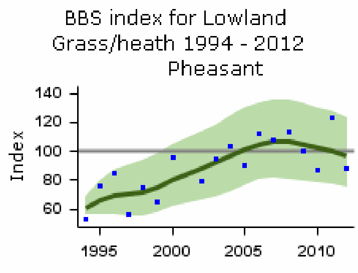

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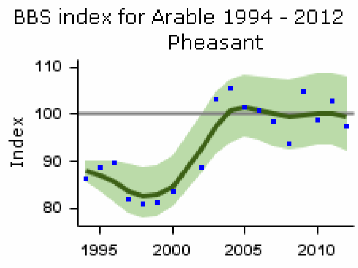

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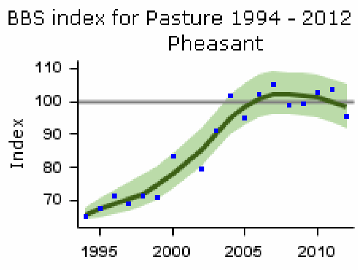

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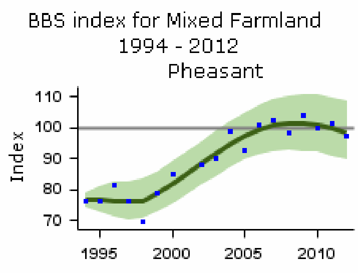

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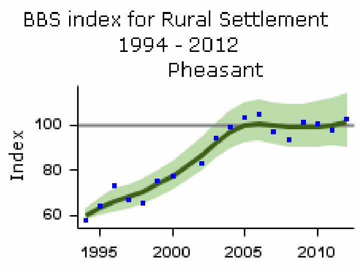

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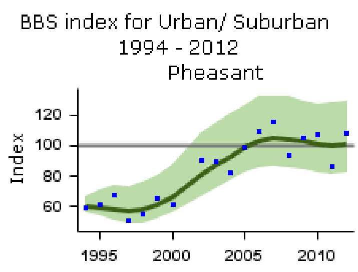

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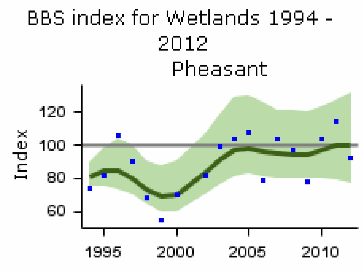
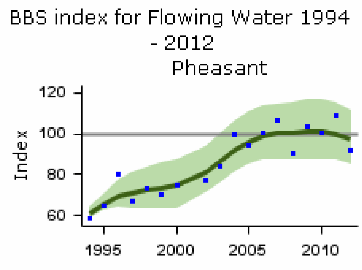


Habitat graph



Habitat 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 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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

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 changes in the distribution of nests recorded might have influenced the results. In 2011, however, there were fewer two-chick broods in Shetland than in any year since at least 1979 (Holling et al. 2013). Nest losses at the egg stage have possibly increased (although samples are small).

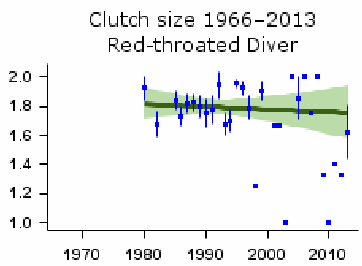
Population changes in detail

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

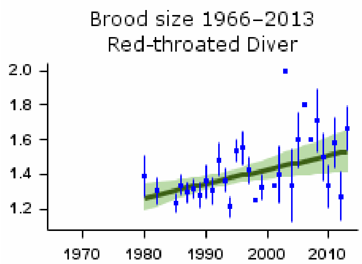
Demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Clutch size	32	1980-2012	18	None					Small sample
Brood size	32	1980-2012	28	Linear increase	1.27 chicks	1.53 chicks	20.5%		Small sample
Nest failure rate at egg stage	32	1980-2012	10	Linear increase	0.62% nests/day	2.85% nests/day	359.7%		Small sample
Nest failure rate at chick stage	32	1980-2012	15	None					Small sample

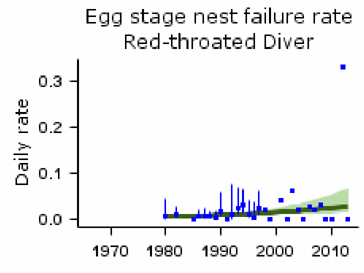
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



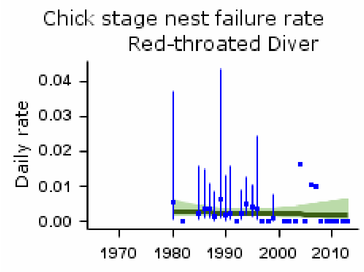
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



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

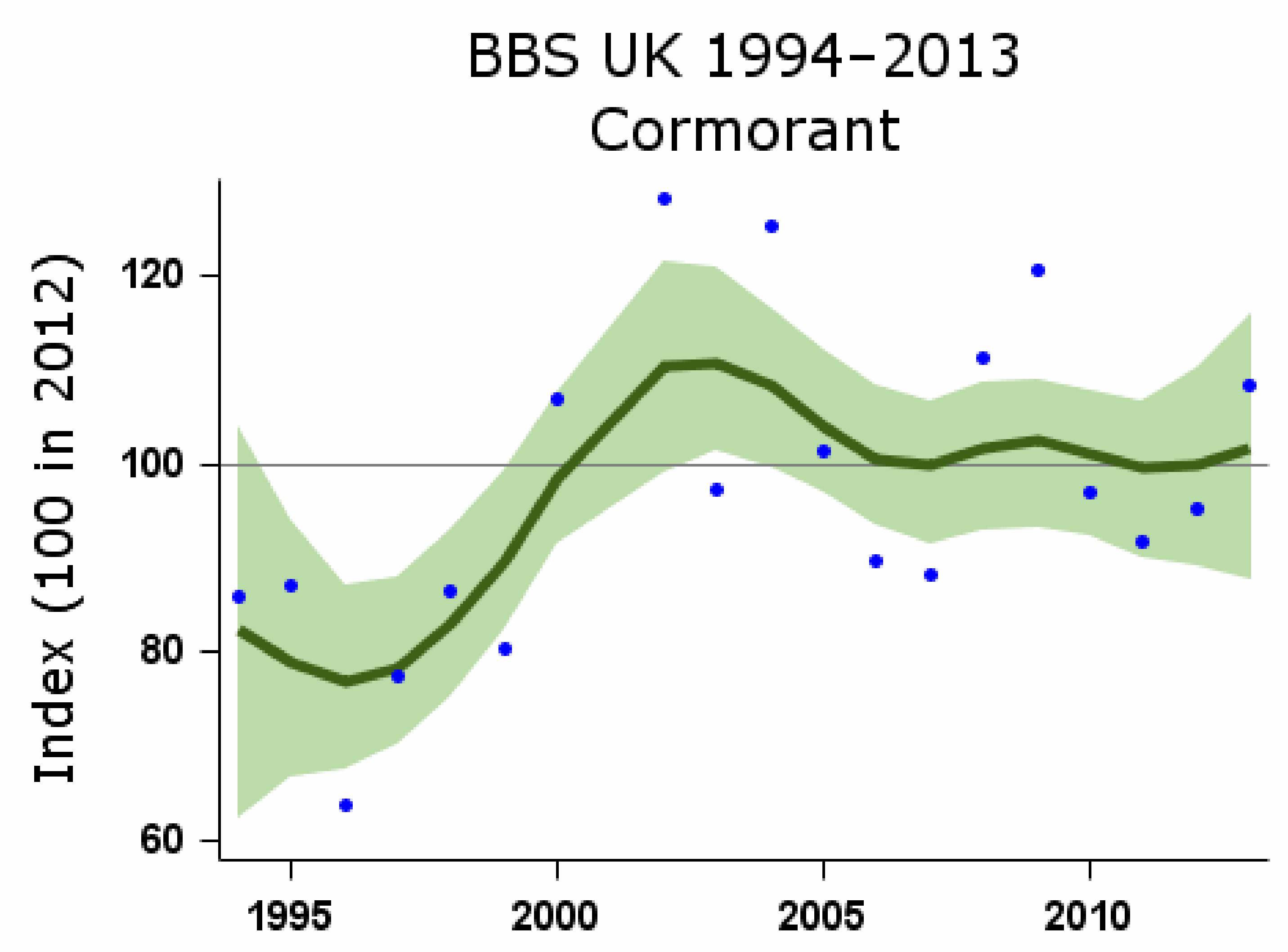
Key facts

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). Breeding had been recorded at 89 inland sites by 2012, and the inland population had risen to about 2,130 pairs by 2005 and 2,362 pairs in 2012 (Newson et al. 2007, 2013). 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 the generally upward, then stable trend adds little to what we know about breeding numbers from SMP. 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 (Austin et al. 2014). An increase in shooting under licence since 2004 has had no detectable effect on population trend (Chamberlain et al. 2013). Although the species is now green listed, both races that occur in the UK qualify for 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

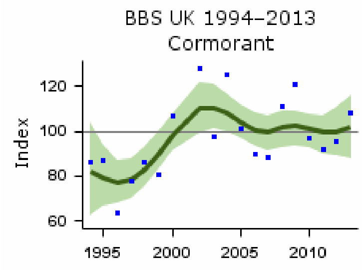
Population changes in detail

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

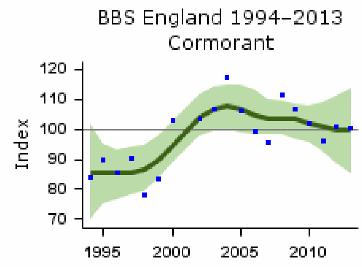
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	17	1995-2012	244	27	4	63		Non-breeders included
	10	2002-2012	293	-9	-25	7		Non-breeders included
	5	2007-2012	321	0	-16	17		Non-breeders included
BBS England	17	1995-2012	204	17	-7	44		Non-breeders included
	10	2002-2012	246	-4	-18	12		Non-breeders included
	5	2007-2012	273	-4	-18	12		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



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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Little Egret

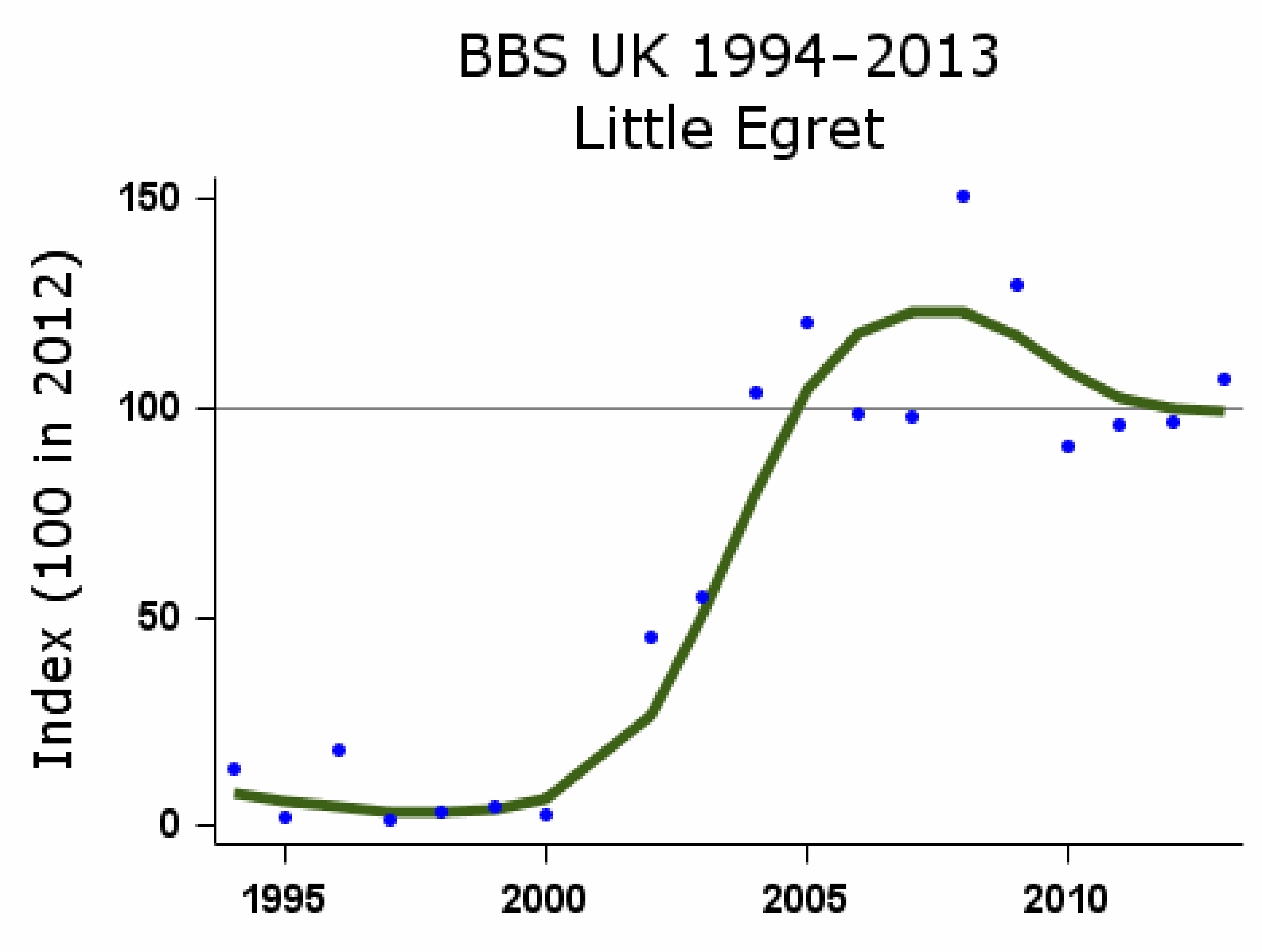
Egretta garzetta

Key facts

Conservation listings:	Europe: no SPEC category (favourable conservation status in Europe, not concentrated in Europe) (BiE04) UK: amber (>50% of UK breeding population found at 10 or fewer sites) (BoCC3); an RBBP species
Long-term trend:	UK, England: rapid increase
Population size:	660-740 pairs in 2006-10 (APEP13: RBBP data); 887-902 pairs in 2012 (Holling & RBBP 2014)

Status summary

Until the 1980s the Little Egret was a very scarce migrant to Britain, especially as an overshoot on spring passage. Since then, its status has utterly changed. Following a rapid build-up of wintering birds, the first breeding pair ever in UK was found in Dorset in 1996 (Lock & Cook 1998, Musgrove 2012). By 2001 the number of breeding pairs had passed 100 and it may already be close to 1,000. Most of these birds remain over winter and are joined by additional birds from the Continent. The primary source of trend data is the nest counts collated by BTO Heronries Census. The total nest count reached a new peak in 2012 (Holling & RBBP 2014). It is notable that the BBS index has met a small setback: this may be the result of recent unusually cold winter weather, to which the species is susceptible (Holt 2012), or an indication that, after barely a decade, the increase might already be starting to level off. It is notable that winter numbers rose rapidly until 2008/09 then, like the BBS index, fell slightly before appearing to start another rise (Austin et al. 2014).



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

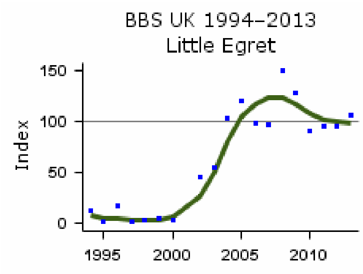
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	17	1995-2012	32	1666				
	10	2002-2012	48	277				
	5	2007-2012	65	-19				

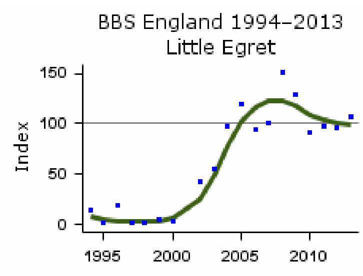
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS England	17	1995-2012	30	1636				
	10	2002-2012	45	290				
	5	2007-2012	61	-18				

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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Grey Heron

Ardea cinerea

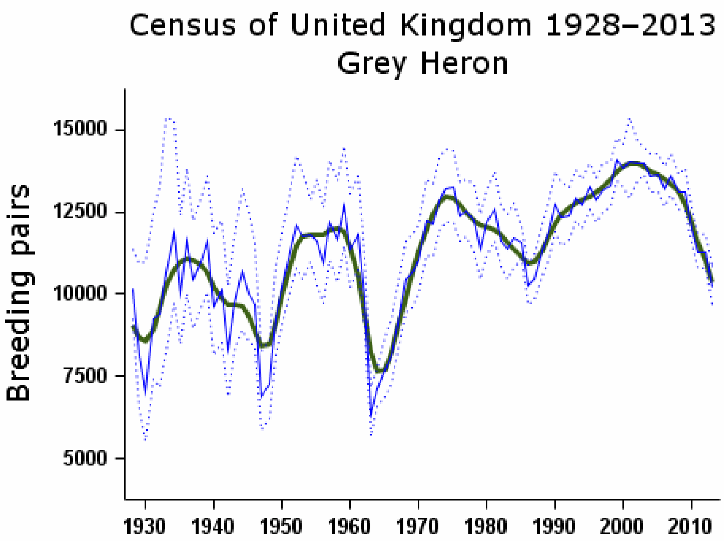
Key facts

Conservation listings:	Europe: no SPEC category (favourable conservation status in Europe, not concentrated in Europe) (BiE04) UK: green (BoCC3)
Long-term trend:	UK, England, Scotland: shallow increase Wales: shallow decline
Population size:	13,000 pairs in 2007-11 (APEP13); 10,197 (9,702-10,818) apparently occupied nests in 2013 (Heronries Census)

Status summary

The BTO Heronries Census, which has monitored Grey Herons since 1928, shows the species to have been more abundant in the early 2000s than at any time in the last 80 years. 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, around 75% of the estimated total population for that year.

The effects of harsh winters, which induce severe mortality in this species (Besbeaset 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 strong downturn evident since 2001 is, as yet, unexplained, though recent cold winter weather and spring gales appear to have accelerated the decline. High rates of nest failure at the chick stage were noted in the late 1960s, but not subsequently. Clutch and brood sizes have fallen in the long term. Numbers have shown widespread moderate increase across Europe since 1980 (PECBMS 2014a).



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	83	1929-2012	338	27	2	51		
	25	1987-2012	545	0	-6	9		
	10	2002-2012	651	-21	-25	-16		
	5	2007-2012	654	-18	-21	-13		
Heronries England and Wales	83	1929-2012	279	30	2	58		
	25	1987-2012	444	-1	-6	7		
	10	2002-2012	520	-23	-25	-17		
	5	2007-2012	517	-19	-21	-13		
Heronries England	83	1929-2012	236	28	1	48		
	25	1987-2012	373	0	-5	9		
	10	2002-2012	446	-22	-25	-16		
	5	2007-2012	447	-19	-21	-13		
Heronries Scotland	77	1935-2012	47	11				
	25	1987-2012	77	20				

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	10	2002-2012	94	-6				
	5	2007-2012	88	-15				
Heronries Wales	77	1935-2012	43	-15				
	25	1987-2012	68	-9				
	10	2002-2012	72	-24				
	5	2007-2012	70	-20				
BBS UK	17	1995-2012	668	-12	-21	-2		Non-breeders included
	10	2002-2012	763	-30	-36	-22	>25	Non-breeders included
	5	2007-2012	806	-21	-26	-16		Non-breeders included
BBS England	17	1995-2012	549	-19	-29	-10		Non-breeders included
	10	2002-2012	632	-28	-34	-22	>25	Non-breeders included
	5	2007-2012	675	-24	-29	-19		Non-breeders included
BBS Scotland	17	1995-2012	52	3	-22	30		Non-breeders included
	10	2002-2012	57	-36	-51	-15	>25	Non-breeders included
	5	2007-2012	62	-20	-36	3		Non-breeders included
BBS Wales	17	1995-2012	44	-16	-38	14		Non-breeders included
	10	2002-2012	47	-35	-48	-20	>25	Non-breeders included
	5	2007-2012	44	-18	-34	-3		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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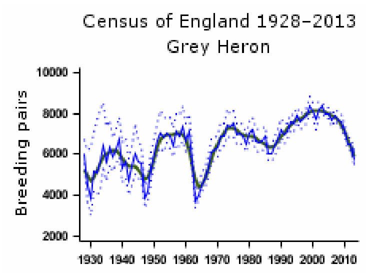
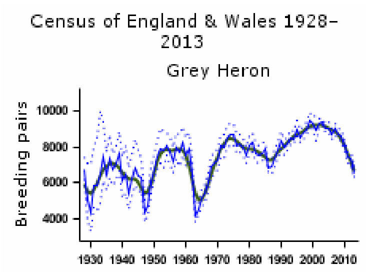
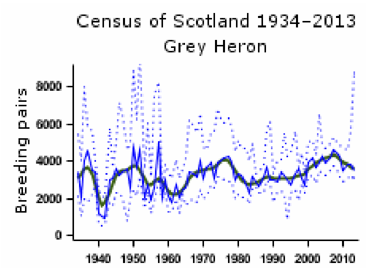
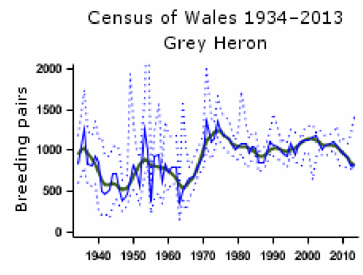


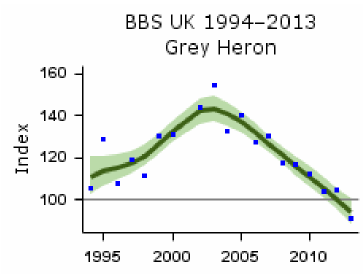




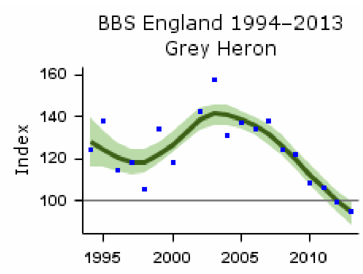
Grey Heron Scotland graph



Grey Heron Wales graph



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



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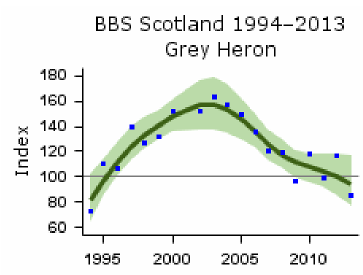
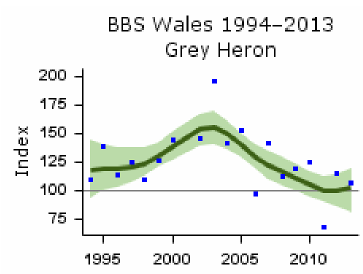
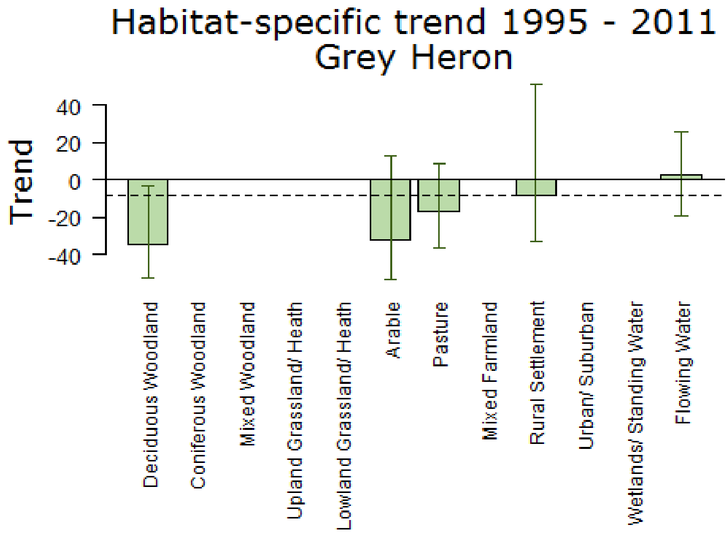


Smoothed population index, relative to an arbitrary 100 in 2009, with 85% confidence limits in green



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

Population trends by habitat



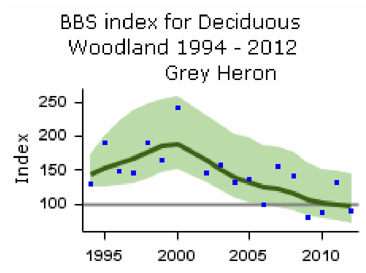
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

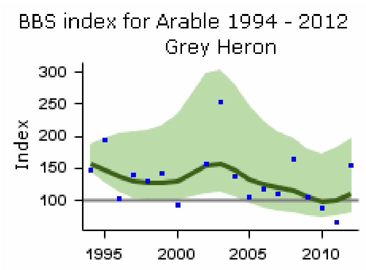
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	40	-35	-53	-3
Arable	16	1995-2011	35	-32	-53	13
Pasture	16	1995-2011	104	-17	-37	9
Rural Settlement	16	1995-2011	38	-8	-33	51
Flowing Water	16	1995-2011	99	3	-19	26

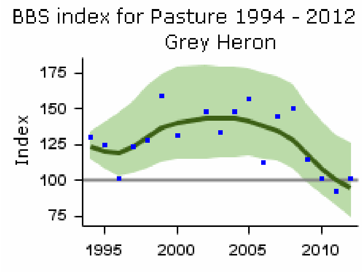
Further information on habitat-specific trends, please follow link here.



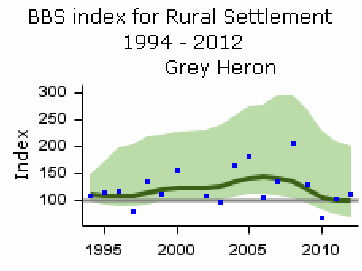
Habitat graph



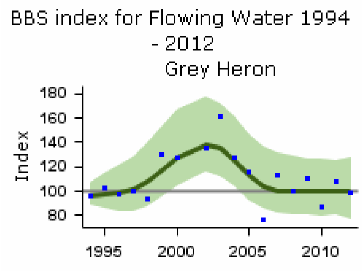
Habitat graph



Habitat graph



Habitat graph

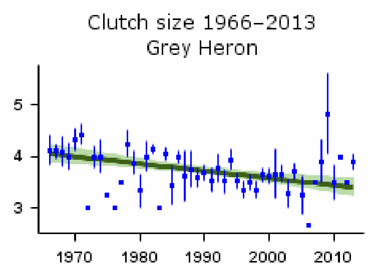


Habitat graph

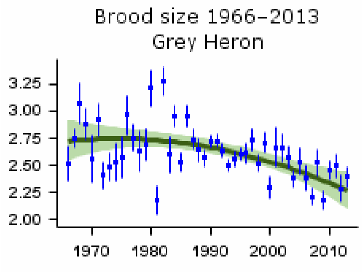
Demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	17	None					
Clutch size	44	1968-2012	15	Linear decline	4.03 eggs	3.42 eggs	-15.2%		Small sample
Brood size	44	1968-2012	89	Curvilinear	2.73 chicks	2.29 chicks	-16.3%		
Nest failure rate at egg stage	44	1968-2012	17	Curvilinear	0.00% nests/day	0.01% nests/day			Small sample
Nest failure rate at chick stage	44	1968-2012	39	None					

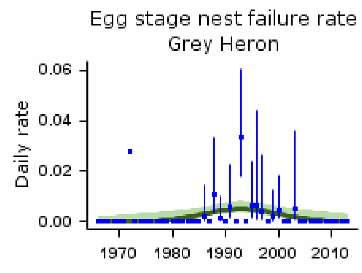
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



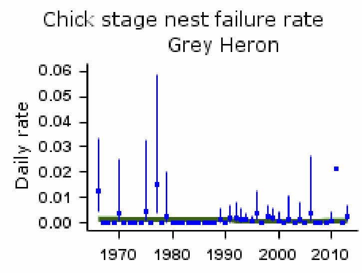
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



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

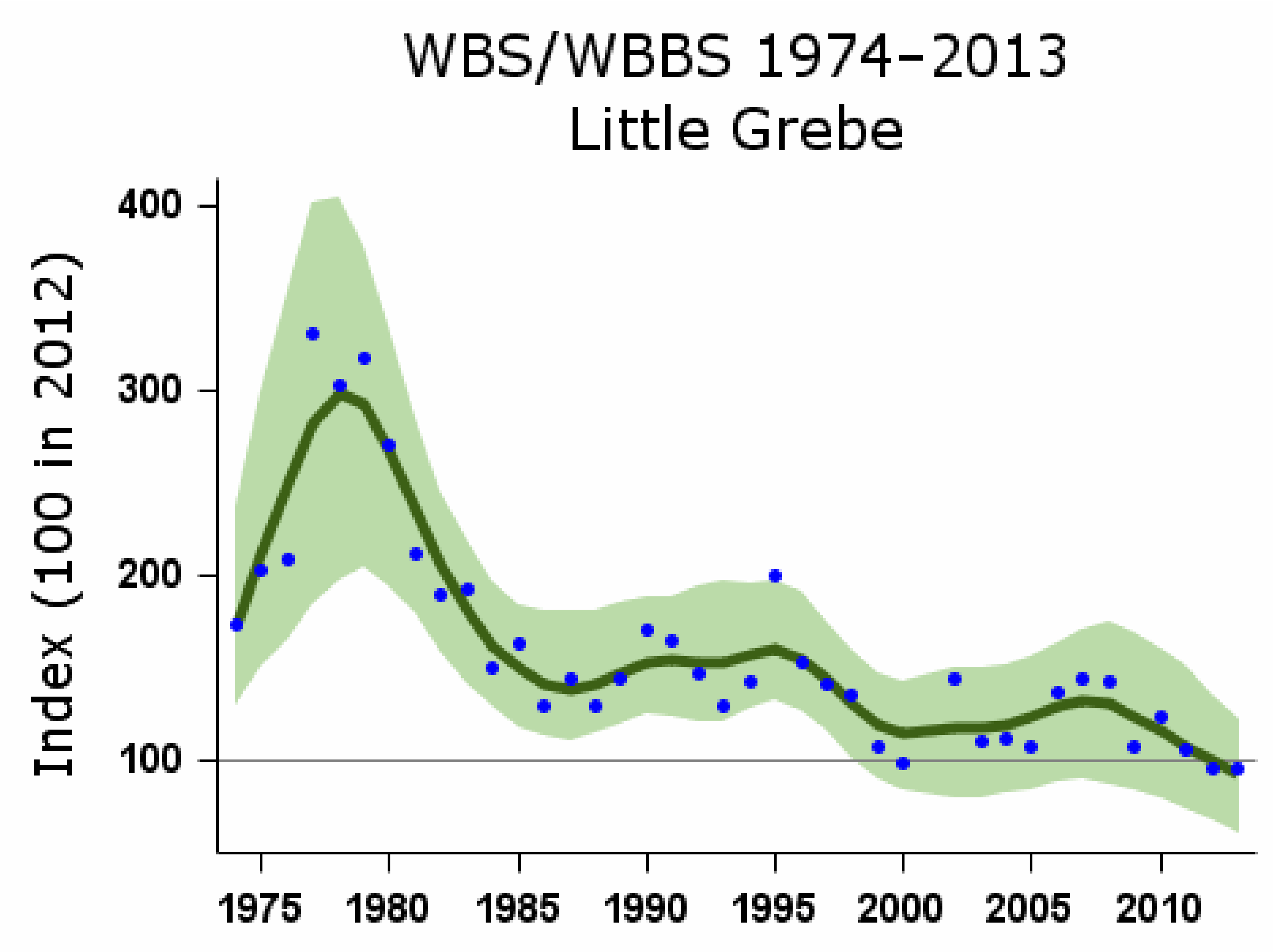
Tachybaptus ruficollis

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 moderate decline shown by the WBS/WBBS may reveal problems among birds on linear waterways during the early 1980s and since the late 1990s, but stability in the long term BBS trend suggests that wider populations (including birds on small still waters) have been more 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. BBS data are now showing significant decline in the recent five-year period. 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 (Austin et al. 2014). Numbers have been broadly stable across Europe since 1990 (PECBMS 2014a).



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

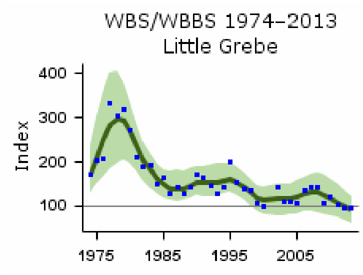
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
WBS/WBBS waterways	37	1975-2012	20	-53	-78	-9	>50	
	25	1987-2012	21	-28	-57	19		

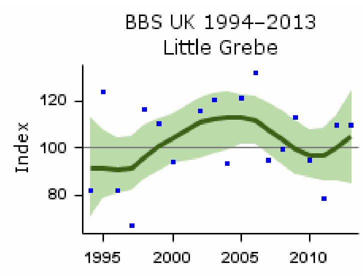
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	10	2002-2012	22	-15	-41	28		
	5	2007-2012	20	-25	-40	6		
BBS UK	17	1995-2012	70	9	-20	40		
	10	2002-2012	81	-10	-29	19		
	5	2007-2012	85	-7	-25	13		
BBS England	17	1995-2012	56	3	-32	45		
	10	2002-2012	63	-11	-38	21		
	5	2007-2012	65	-5	-30	23		

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

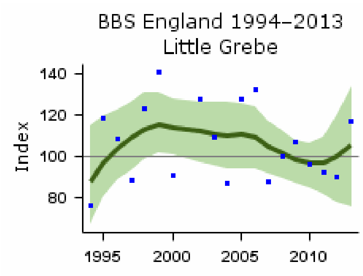
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



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

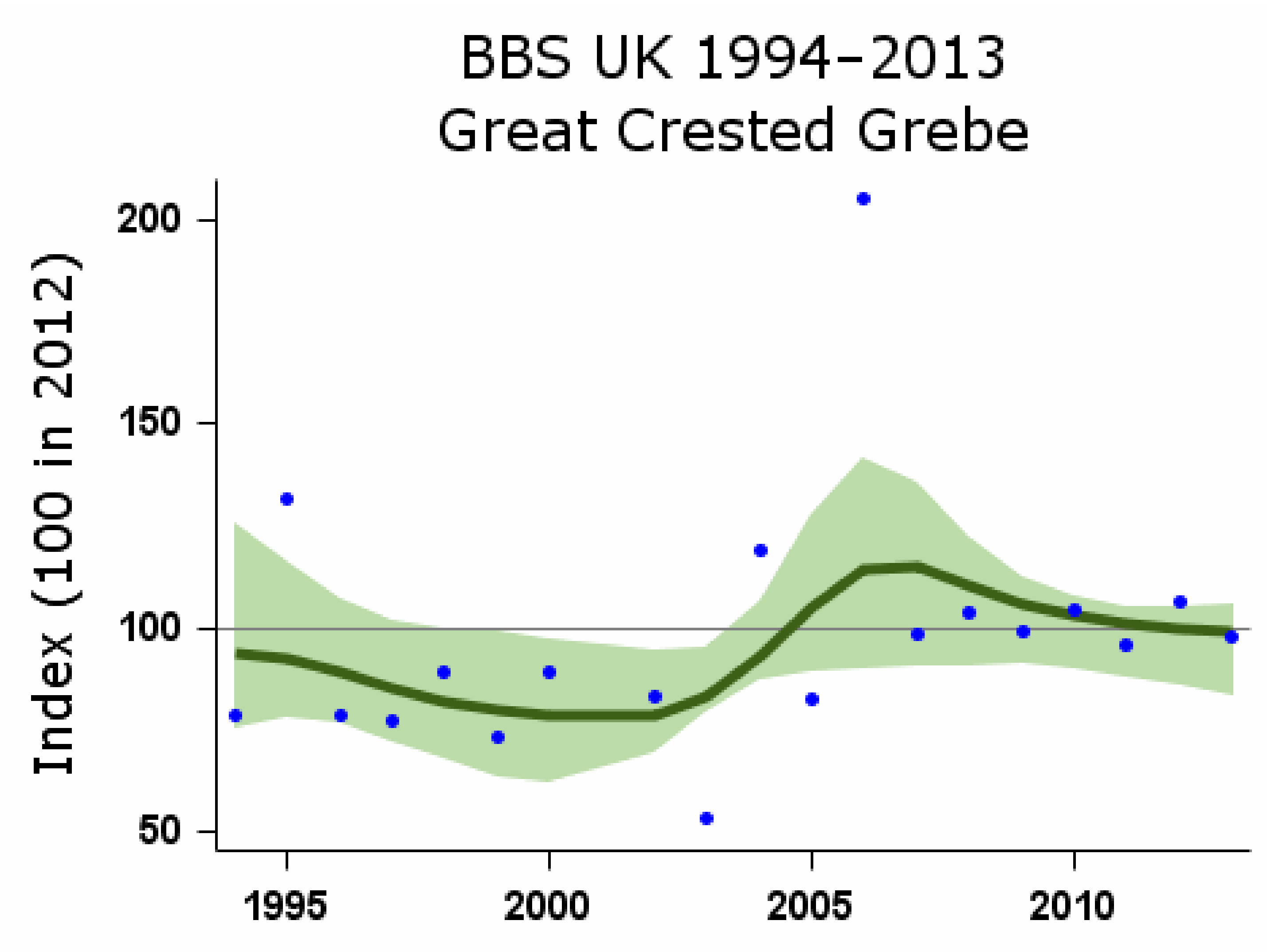
Podiceps cristatus

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: stable
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 extensive new 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 national-scale annual monitoring of this species and indicates no clear trend since 1994. Winter numbers, monitored by WeBS, have shown a long-term shallow increase but may now be in shallow decline (Austin et al. 2014). Numbers have shown widespread moderate decline across Europe since 1990 (PECBMS 2014a).



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	17	1995-2012	72	8	-24	34		
	10	2002-2012	79	27	-3	46		
	5	2007-2012	87	-13	-35	12		
BBS England	17	1995-2012	66	-8	-28	12		

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	10	2002-2012	73	14	-6	33		
	5	2007-2012	80	1	-14	18		

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

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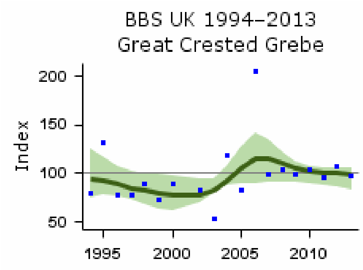
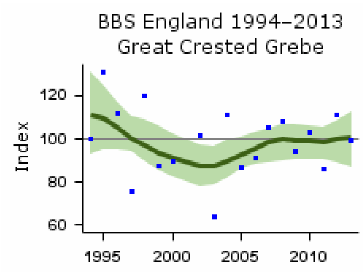


BBS UK graph



BBS England graph

Demographic trends

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

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Red Kite

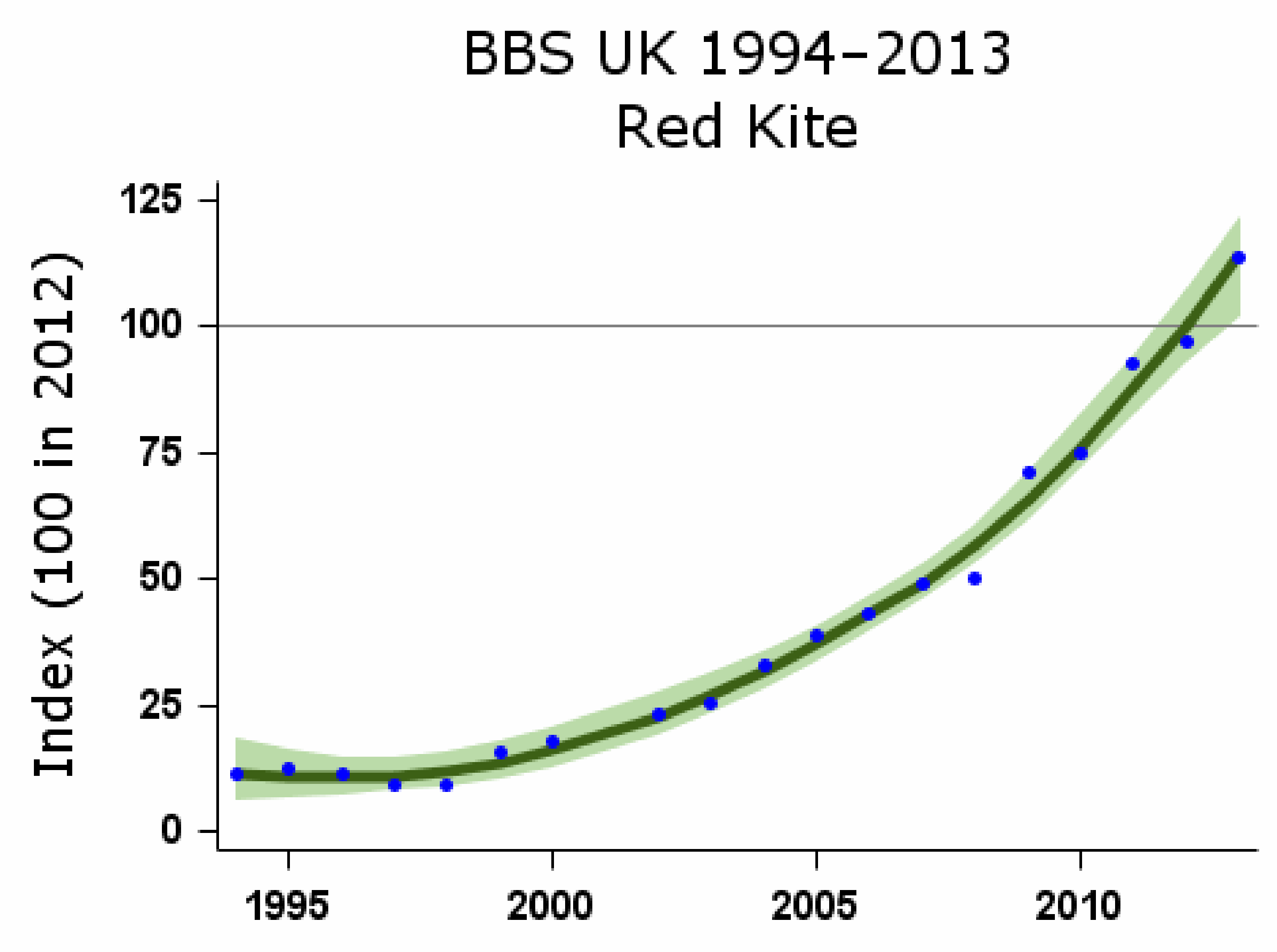
Milvus milvus

Key facts

Conservation listings:	Global: Near Threatened (BiE04) UK: amber (European decline) (BoCC3)
Long-term trend:	UK, England: rapid increase
Population size:	1,600 pairs in 2006-10 (APEP13: RBBP data); approaching 2,500 pairs by 2012 (Holling & RBBP 2014)

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 established in both areas. Further releases were begun in Northamptonshire in 1995, central Scotland in 1996, Yorkshire in 1999, Dumfries & Galloway in 2001, northeast England in 2004 and County Down in 2008. Each of these centres has given rise to a productive breeding group, in some cases benefiting from large-scale provision of food (e.g. Orros & Fellowes 2014) 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 (Balmer et al. 2013). BBS sightings have shown an exponential rise since 1994. Illegal killing is continuing and in northern Scotland the use of poisoned baits deliberately to kill raptors 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

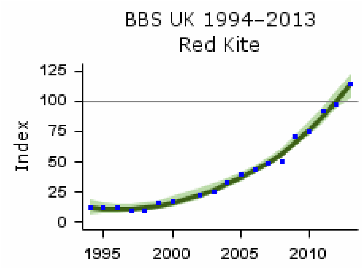
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	17	1995-2012	99	805	461	1524		

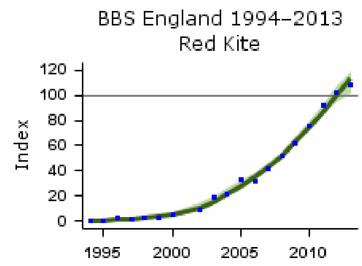
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	10	2002-2012	144	339	235	492		
	5	2007-2012	202	104	78	130		
BBS England	17	1995-2012	71	12792	5390	12532		
	10	2002-2012	107	837	560	1171		
	5	2007-2012	158	131	102	167		

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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

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:	662 (576-770) pairs in UK and Isle of Man in 2010 (Hayhow et al. 2013)

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, revealed a decline of around 18% since the 2004 survey: a notable decrease in Scotland might stem from habitat change and illegal persecution, while illegal persecution continues to limit harriers in England to very low levels of population (Hayhow et al. 2013). There are renewed efforts currently to resolve the conflict between managed moorland and raptor conservation, amid public petitions and demonstrations against wildlife crime on grouse moors (Amar 2014, Elston et al. 2014).

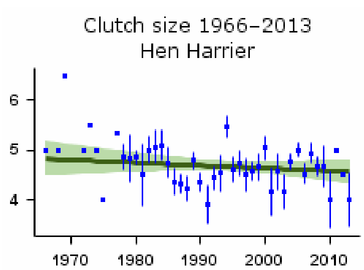
Population changes in detail

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

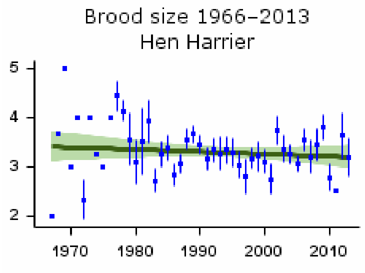
Demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	9	Curvilinear	3.44 fledglings	3.45 fledglings	0.1%		
Clutch size	44	1968-2012	12	None					Small sample
Brood size	44	1968-2012	18	None					Small sample
Nest failure rate at egg stage	44	1968-2012	10	Curvilinear	0.02% nests/day	0.03% nests/day	50.0%		Small sample
Nest failure rate at chick stage	44	1968-2012	13	None					Small sample

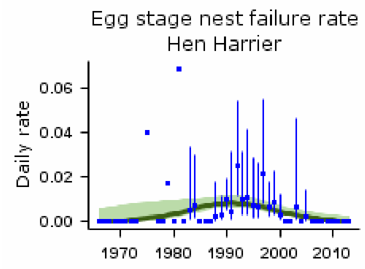
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



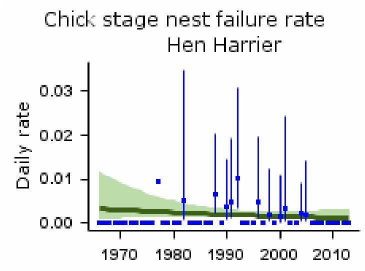
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



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 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. Keepering that remains within the law, however, can benefit harrier populations by increasing their prey and reducing their nest predators, especially crows and foxes (Baines & Richardson 2013).

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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Sparrowhawk

Accipiter nisus

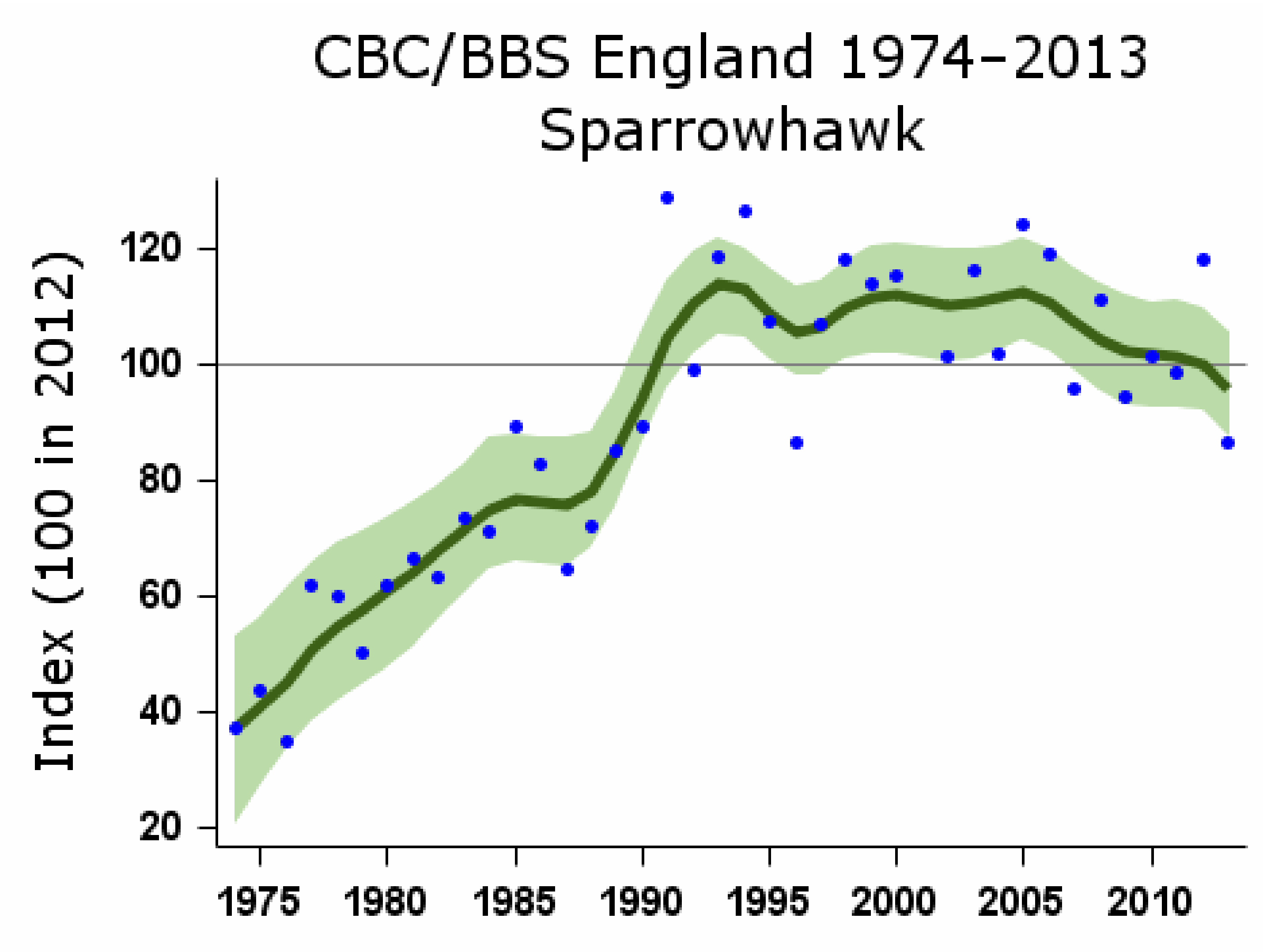
Key facts

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 first two atlas periods (Gibbons et al. 1993). The population has stabilised since the mid 1990s, though population fluctuations are now evident. Nest productivity has risen, especially during the period of strong population increase. There has been little long-term change across Europe since 1980 (PECBMS 2014a).



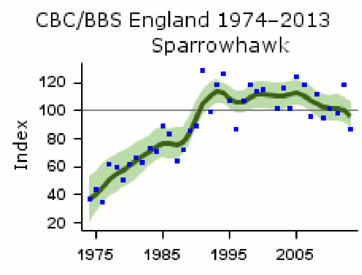
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

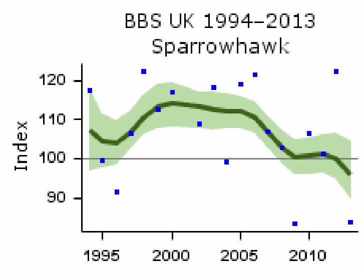
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	37	1975-2012	168	145	60	313		
	25	1987-2012	233	32	4	69		
	10	2002-2012	331	-9	-17	1		
	5	2007-2012	355	-7	-14	1		
BBS UK	17	1995-2012	356	-4	-15	9		
	10	2002-2012	399	-12	-19	-2		
	5	2007-2012	427	-6	-13	2		
BBS England	17	1995-2012	296	-7	-18	3		
	10	2002-2012	331	-10	-17	-2		
	5	2007-2012	355	-7	-13	1		

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

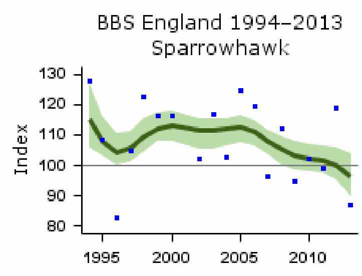
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



CBC/BBS England graph

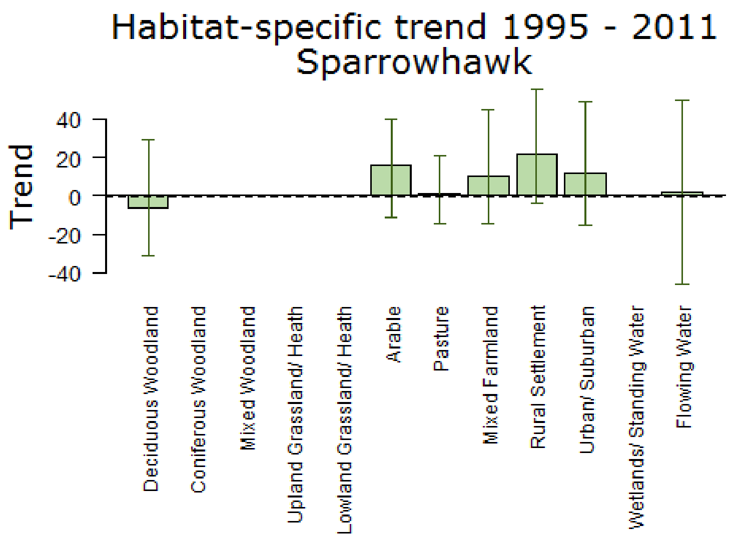


BBS UK graph



BBS England graph

Population trends by habitat



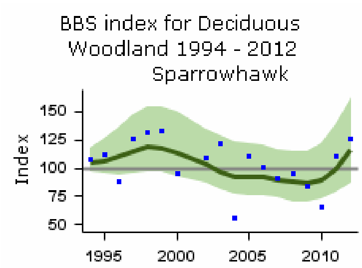
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

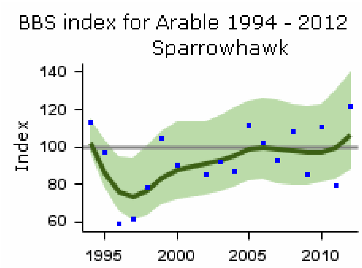
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	56	-7	-31	29
Arable	16	1995-2011	60	16	-11	40
Pasture	16	1995-2011	111	1	-14	21
Mixed Farmland	16	1995-2011	46	10	-15	45
Rural Settlement	16	1995-2011	54	22	-4	55
Urban/ Suburban	16	1995-2011	43	12	-15	49
Flowing Water	16	1995-2011	33	2	-46	50

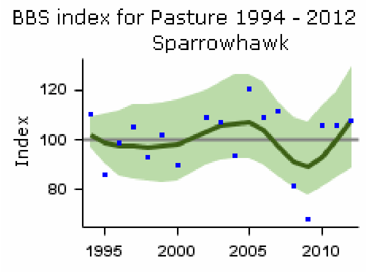
Further information on habitat-specific trends, please follow link here.



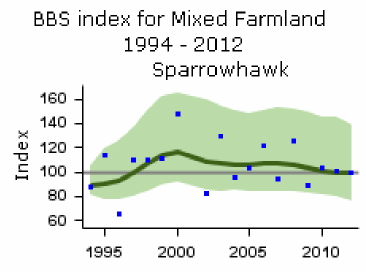
Habitat graph



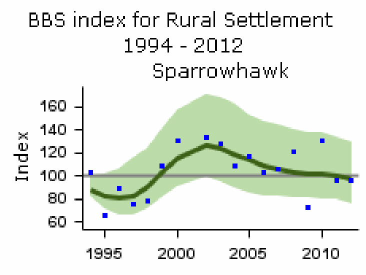
Habitat graph



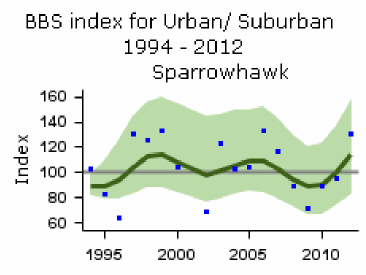
Habitat graph



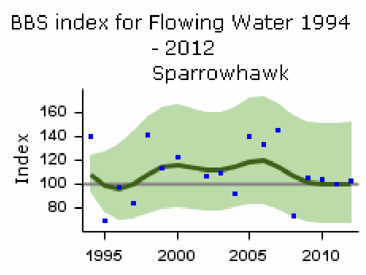
Habitat graph



Habitat graph

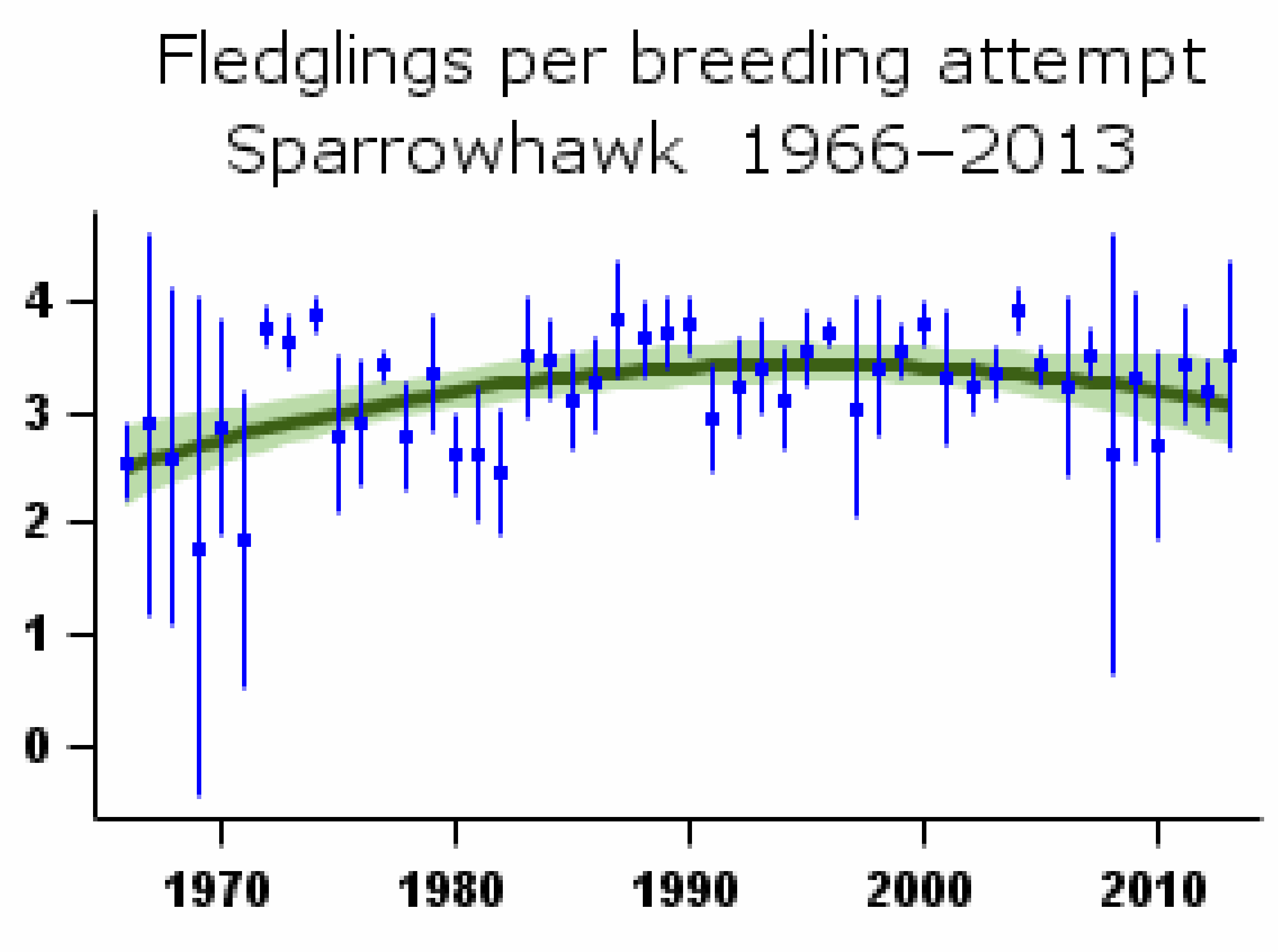


Habitat graph

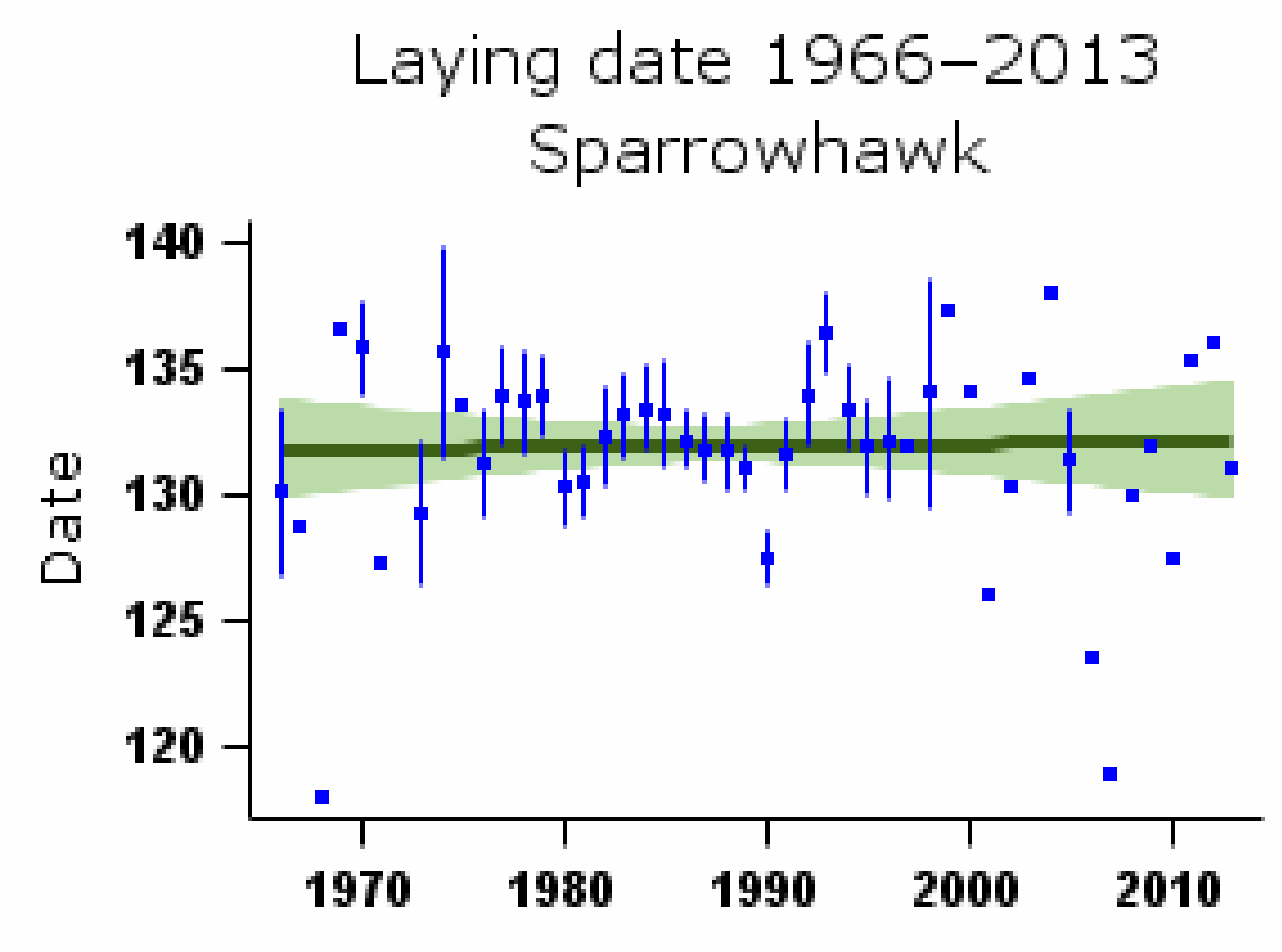


Habitat graph

Demographic trends



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

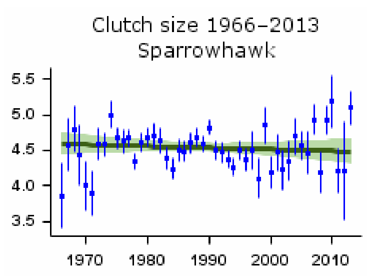


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

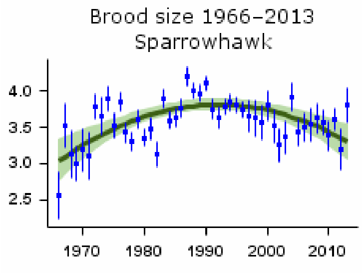
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	31	Curvilinear	2.64 fledglings	3.13 fledglings	18.4%		
Clutch size	44	1968-2012	33	None					
Brood size	44	1968-2012	68	Curvilinear	3.15 chicks	3.35 chicks	6.3%		
Nest failure rate at egg stage	44	1968-2012	31	Linear decline	0.47% nests/day	0.06% nests/day	-87.2%		
Nest failure rate at chick stage	44	1968-2012	44	None					
Laying date	44	1968-2012	12	None			0 days		Small sample

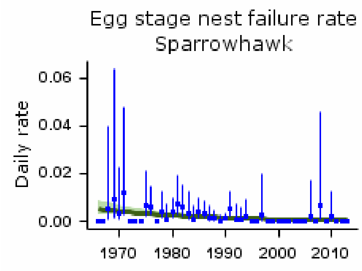
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



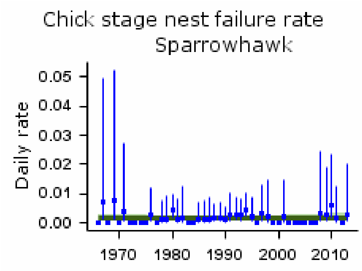
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



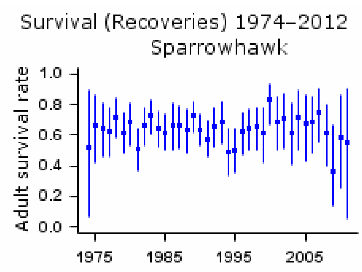
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



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 based on dead recoveries of ringed birds - error bars represent 95% confidence limits

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, 2013). 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. Integrated population modelling supports the importance of productivity, as well as the survival of first-year birds, in determining population change (Robinson et al. 2014). This also suggested that an unknown factor, perhaps the availability of good-quality territories (and hence the number of individuals that can breed each year), also influences the annual population change.

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).

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Buzzard

Buteo buteo

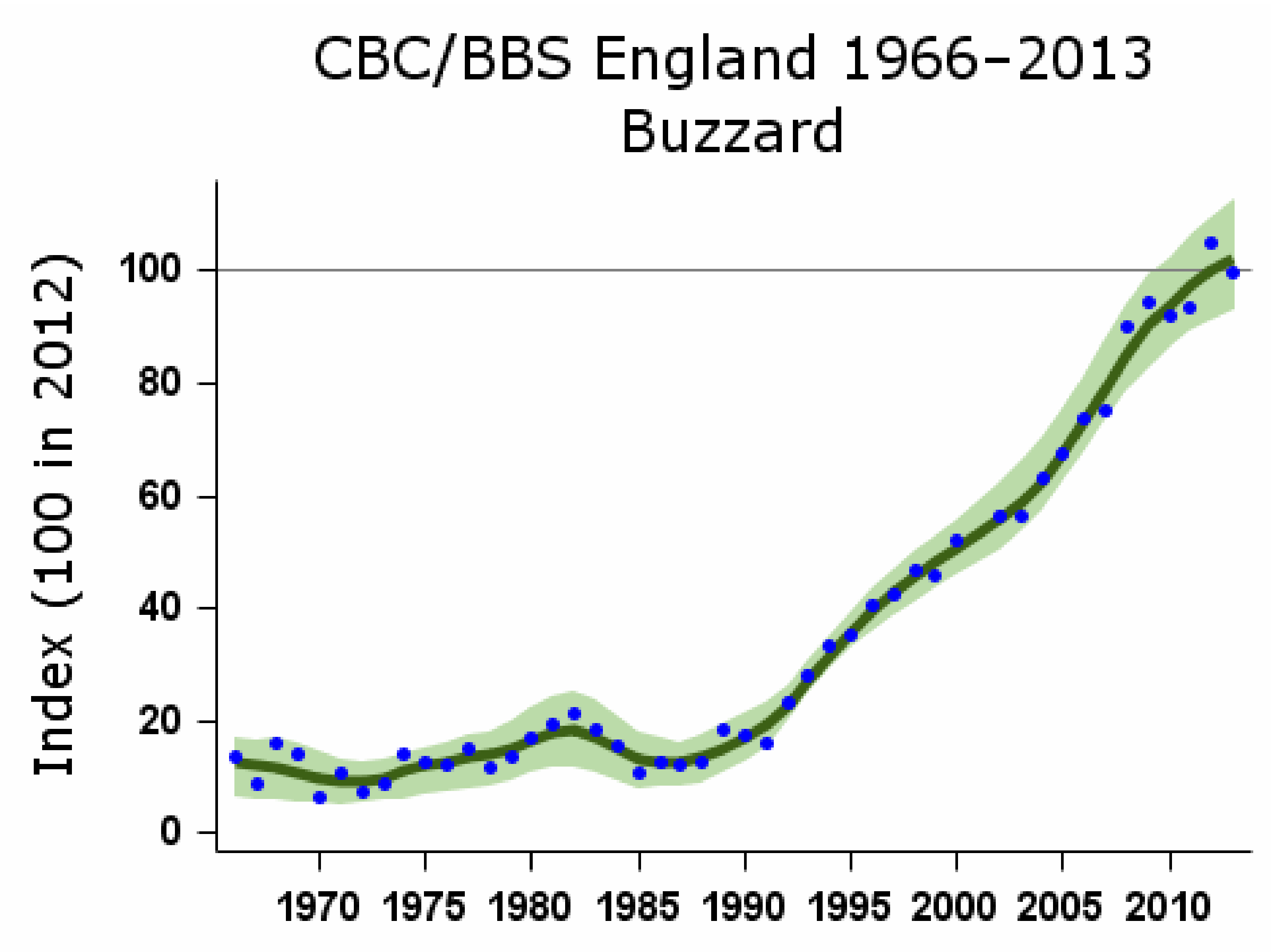
Key facts

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 Buzzard has shown a substantial eastward range expansion since the 1988-91 Atlas and is now an almost ubiquitous breeding bird in the UK (Balmer et al. 2013). For more than a decade it has been the most abundant UK raptor (Clements 2002). The increasing trend identified by the CBC relates especially to the spread of range into central and eastern Britain, where CBC was 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 2014a). Though breeding success is still rising overall, a decrease in productivity has been documented in Avon, per pair but not per unit area, as the population has risen (Prytherch 2013) .



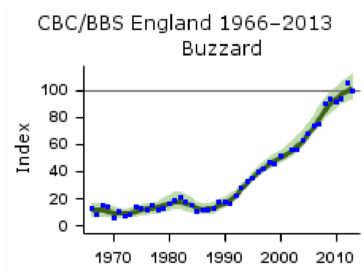
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

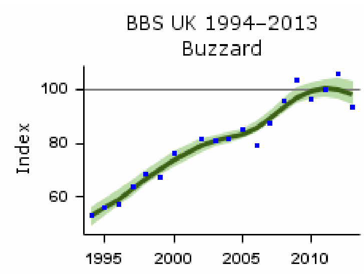
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	45	1967-2012	260	735	444	1822		Small CBC sample
	25	1987-2012	459	694	449	1351		
	10	2002-2012	855	80	66	94		
	5	2007-2012	1095	26	19	32		
BBS UK	17	1995-2012	968	79	64	98		
	10	2002-2012	1230	26	19	36		
	5	2007-2012	1506	12	7	17		
BBS England	17	1995-2012	648	175	139	215		
	10	2002-2012	855	80	66	95		
	5	2007-2012	1095	27	20	31		
BBS Scotland	17	1995-2012	146	24	5	51		
	10	2002-2012	171	-20	-29	-7		
	5	2007-2012	202	-8	-16	2		
BBS Wales	17	1995-2012	143	-1	-15	19		
	10	2002-2012	161	-6	-15	6		
	5	2007-2012	159	-1	-10	10		
BBS N.Ireland	17	1995-2012	32	854399				
	10	2002-2012	42	38				
	5	2007-2012	47	11				

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

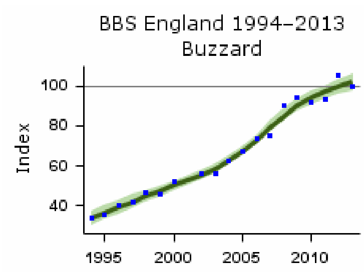
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



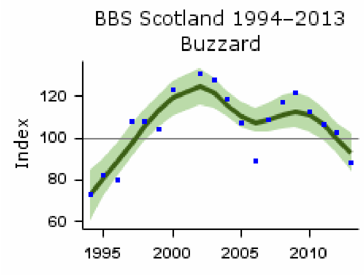
CBC/BBS England graph



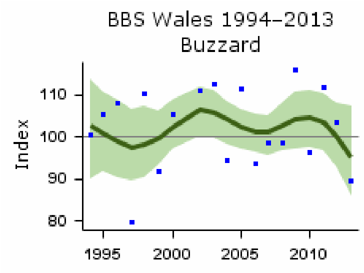
BBS UK graph



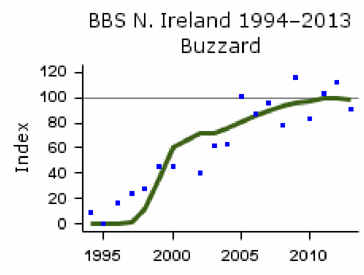
BBS England graph



BBS Scotland graph

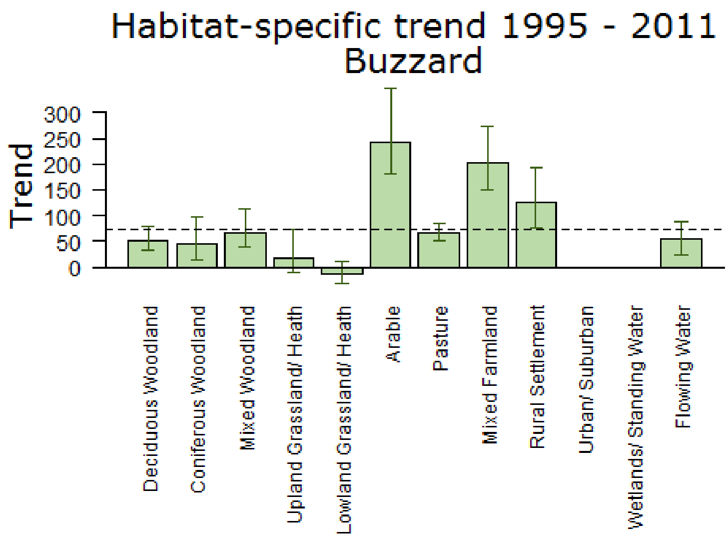


BBS Wales graph



BBS N.Ireland graph

Population trends by habitat



Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

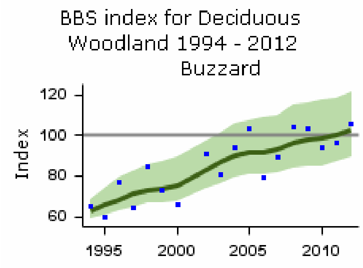
Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

More on habitat trends

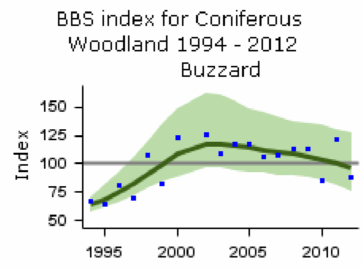
Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	190	52	31	78

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Coniferous Woodland	16	1995-2011	75	45	14	96
Mixed Woodland	16	1995-2011	119	68	38	112
Upland Grassland/ Heath	16	1995-2011	37	18	-11	74
Lowland Grassland/ Heath	16	1995-2011	63	-14	-31	11
Arable	16	1995-2011	175	242	182	347
Pasture	16	1995-2011	429	65	50	84
Mixed Farmland	16	1995-2011	155	203	149	272
Rural Settlement	16	1995-2011	111	125	76	194
Flowing Water	16	1995-2011	107	53	24	89

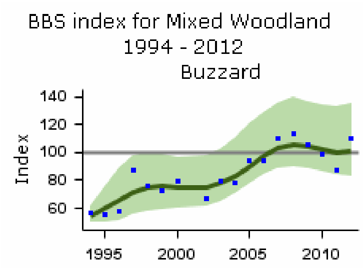
Further information on habitat-specific trends, please follow link here.



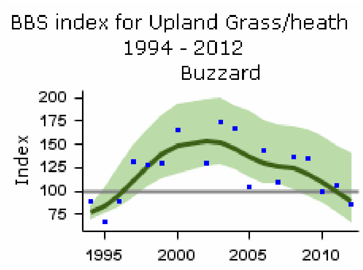
Habitat graph



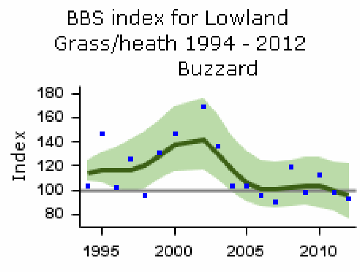
Habitat graph



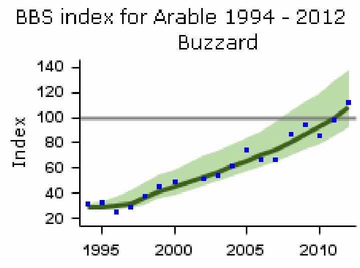
Habitat graph



Habitat graph



Habitat graph



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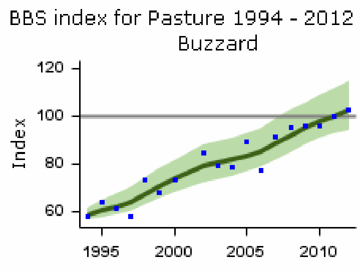

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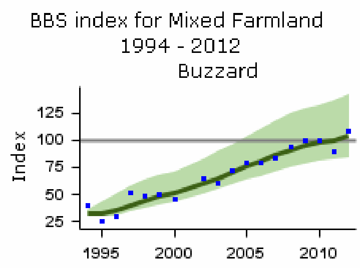

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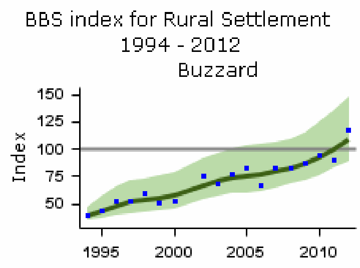
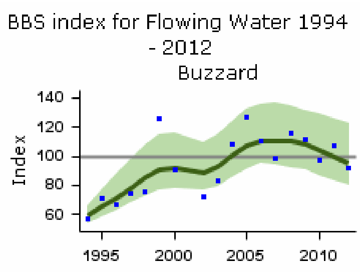
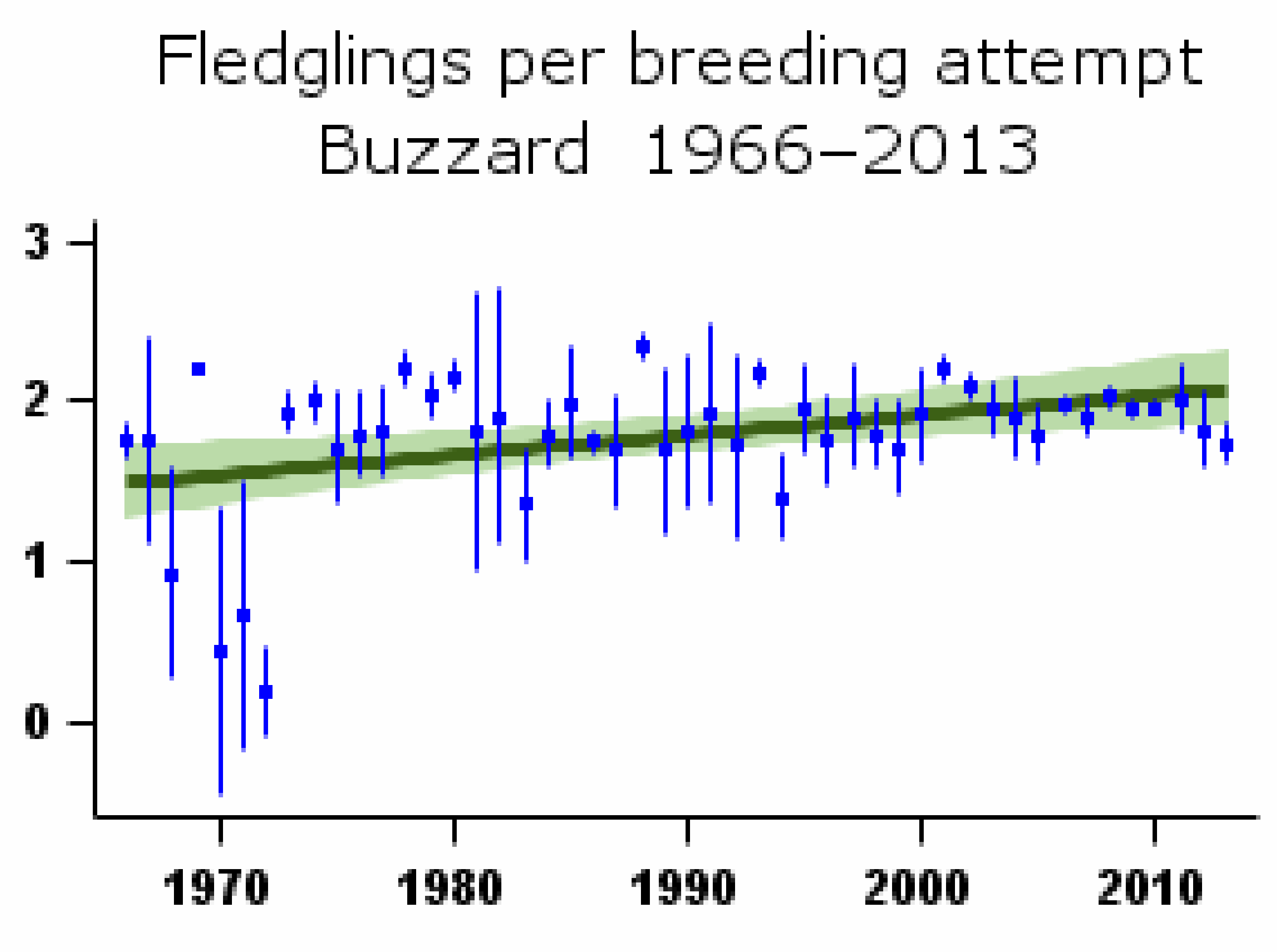


Habitat graph

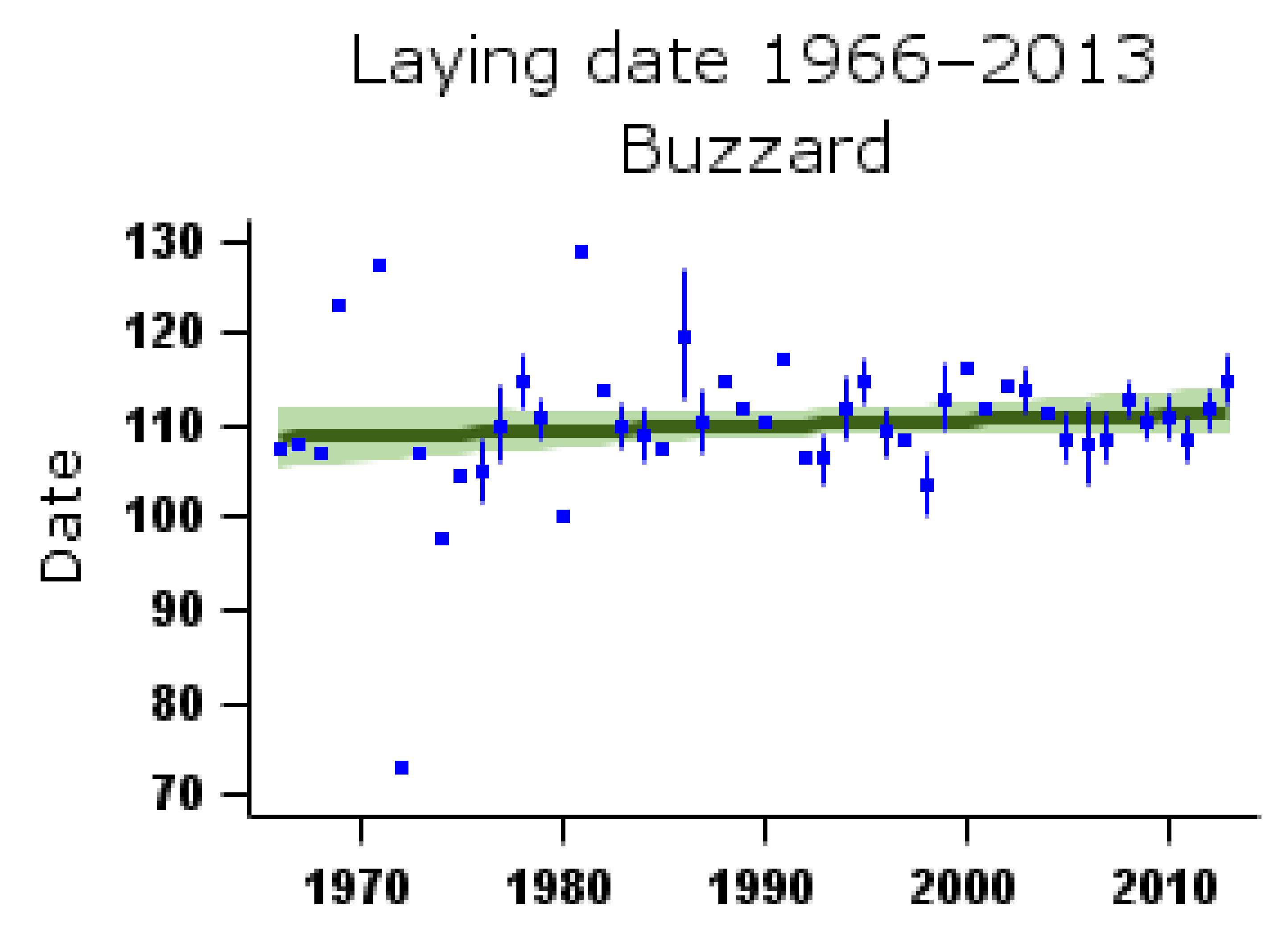


Habitat graph

Demographic trends



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

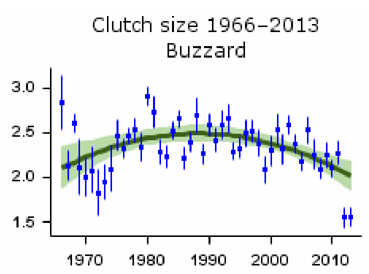


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

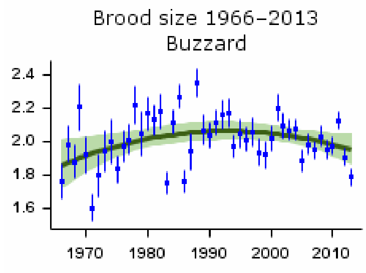
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	29	Linear increase	1.52 fledglings	2.07 fledglings	35.8%		
Clutch size	44	1968-2012	35	Curvilinear	2.17 eggs	2.05 eggs	-5.5%		
Brood size	44	1968-2012	110	Curvilinear	1.89 chicks	1.96 chicks	3.8%		
Nest failure rate at egg stage	44	1968-2012	29	Linear decline	0.81% nests/day	0.05% nests/day	-93.8%		Small sample
Nest failure rate at chick stage	44	1968-2012	54	None					
Laying date	44	1968-2012	6	None			0 days		Small sample

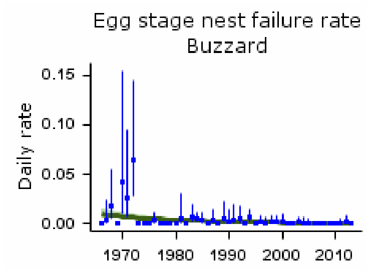
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



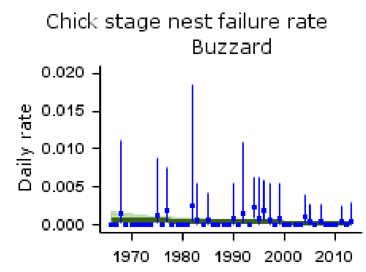
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



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 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, for example 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, Sim et al. 2000, 2001a, Clements 2002). 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 that 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 where 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, Rooney et al. 2015). It is, therefore, plausible that Buzzard distribution is influenced by rabbit abundance, which has 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. In Poland, the spread of oilseed rape has boosted vole populations (of a species not found in UK) and Buzzard productivity has correspondingly improved (Panek & Husek 2014). 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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Moorhen

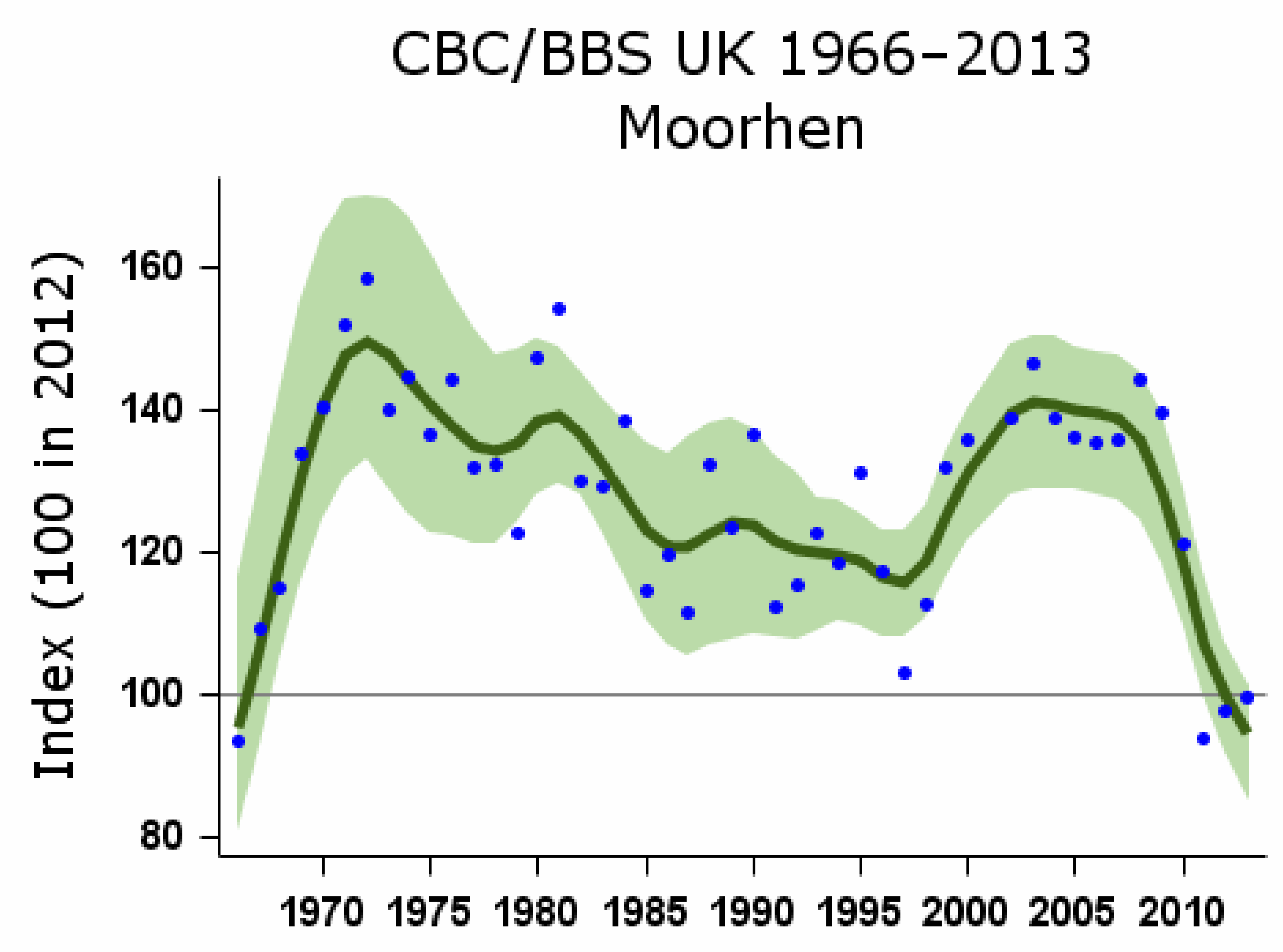
Gallinula chloropus

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 decline
Population size:	270,000 territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Status summary

Trends for this species show wide fluctuations that are related to its high potential for reproduction and to its susceptibility to cold winter weather. The BBS Leech & Barimore 2008); there has been shallow decline in the number of fledglings per breeding attempt. There has been little long-term change across Europe since 1980 (PECBMS 2014a).



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

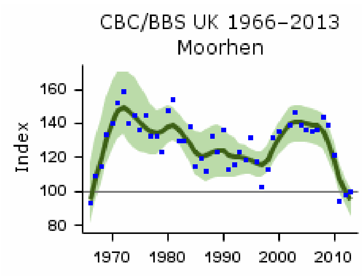
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	45	1967-2012	329	-7	-29	17		
	25	1987-2012	509	-17	-29	-6		
	10	2002-2012	723	-28	-33	-23	>25	
	5	2007-2012	774	-28	-32	-24	>25	
CBC/BBS England	45	1967-2012	303	0	-22	23		
	25	1987-2012	471	-18	-29	-5		

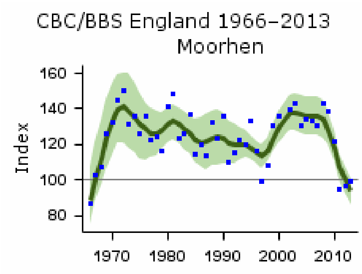
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	5	2007-2012	724	-26	-31	-22	>25	
WBS/WBBS waterways	37	1975-2012	123	-33	-49	-11	>25	
	25	1987-2012	148	-9	-29	13		
	10	2002-2012	193	-23	-31	-14		
	5	2007-2012	168	-24	-30	-17		
BBS UK	17	1995-2012	654	-14	-20	-5		
	10	2002-2012	723	-28	-33	-23	>25	
	5	2007-2012	774	-27	-31	-23	>25	
BBS England	17	1995-2012	606	-15	-22	-7		
	10	2002-2012	672	-27	-31	-22	>25	
	5	2007-2012	724	-26	-30	-22	>25	

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

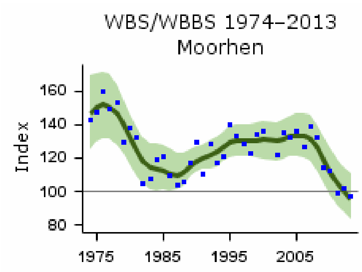
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



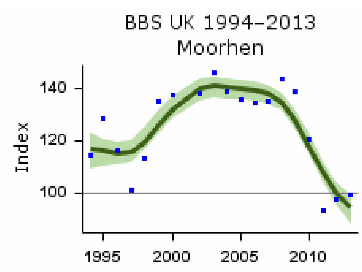
CBC/BBS UK graph



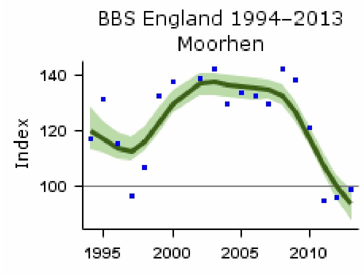
CBC/BBS England graph



WBS/WBBS waterways graph

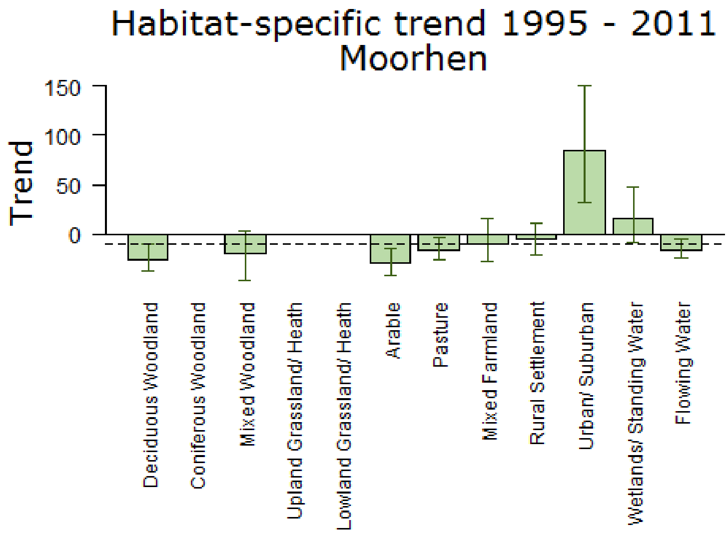


BBS UK graph



BBS England graph

Population trends by habitat



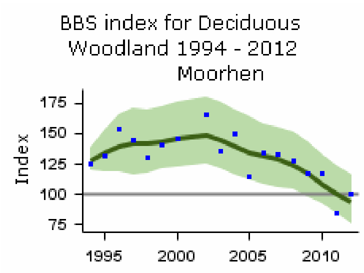
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

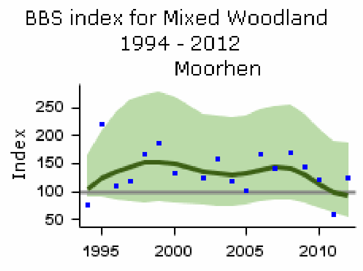
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	117	-26	-36	-10
Mixed Woodland	16	1995-2011	40	-19	-46	3
Arable	16	1995-2011	130	-29	-42	-15
Pasture	16	1995-2011	235	-16	-25	-4
Mixed Farmland	16	1995-2011	100	-10	-27	15
Rural Settlement	16	1995-2011	138	-6	-21	11
Urban/ Suburban	16	1995-2011	67	85	32	150
Wetlands/ Standing Water	16	1995-2011	61	16	-9	47
Flowing Water	16	1995-2011	252	-16	-24	-5

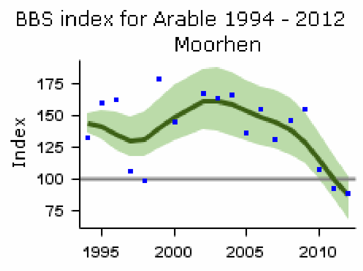
Further information on habitat-specific trends, please follow link here.



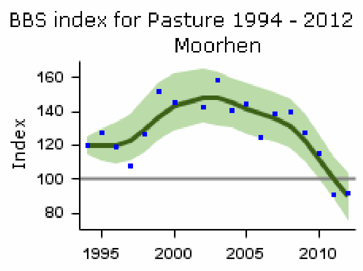
Habitat graph



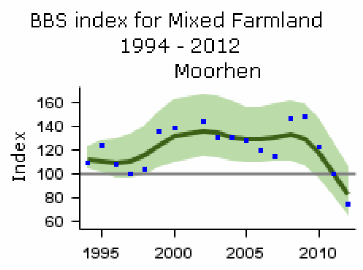
Habitat graph



Habitat graph



Habitat graph



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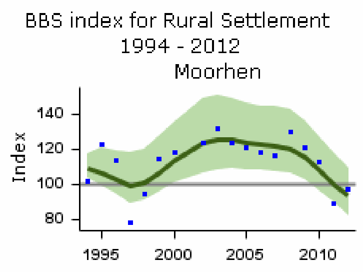

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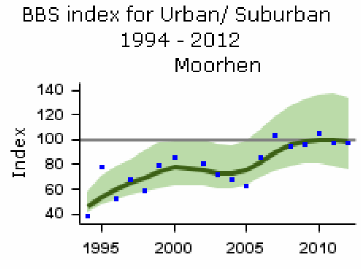
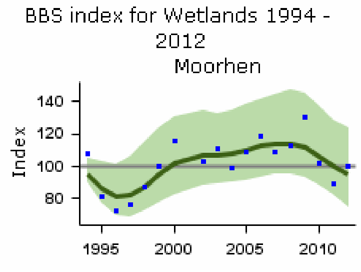
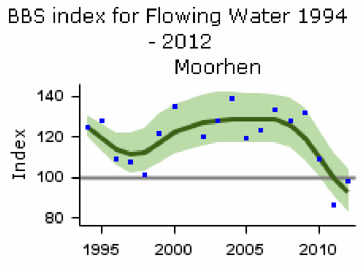


Habitat graph

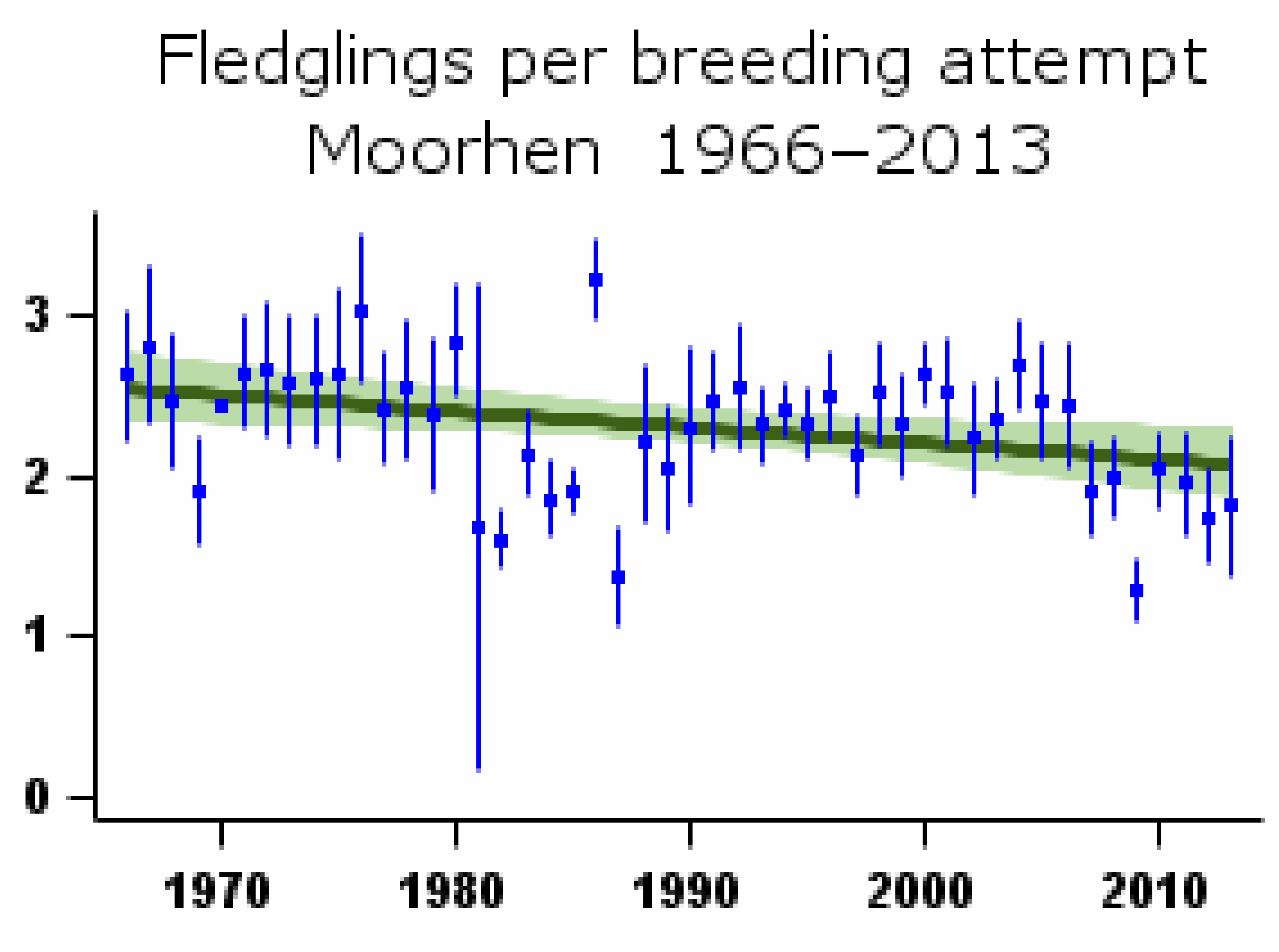


Habitat graph

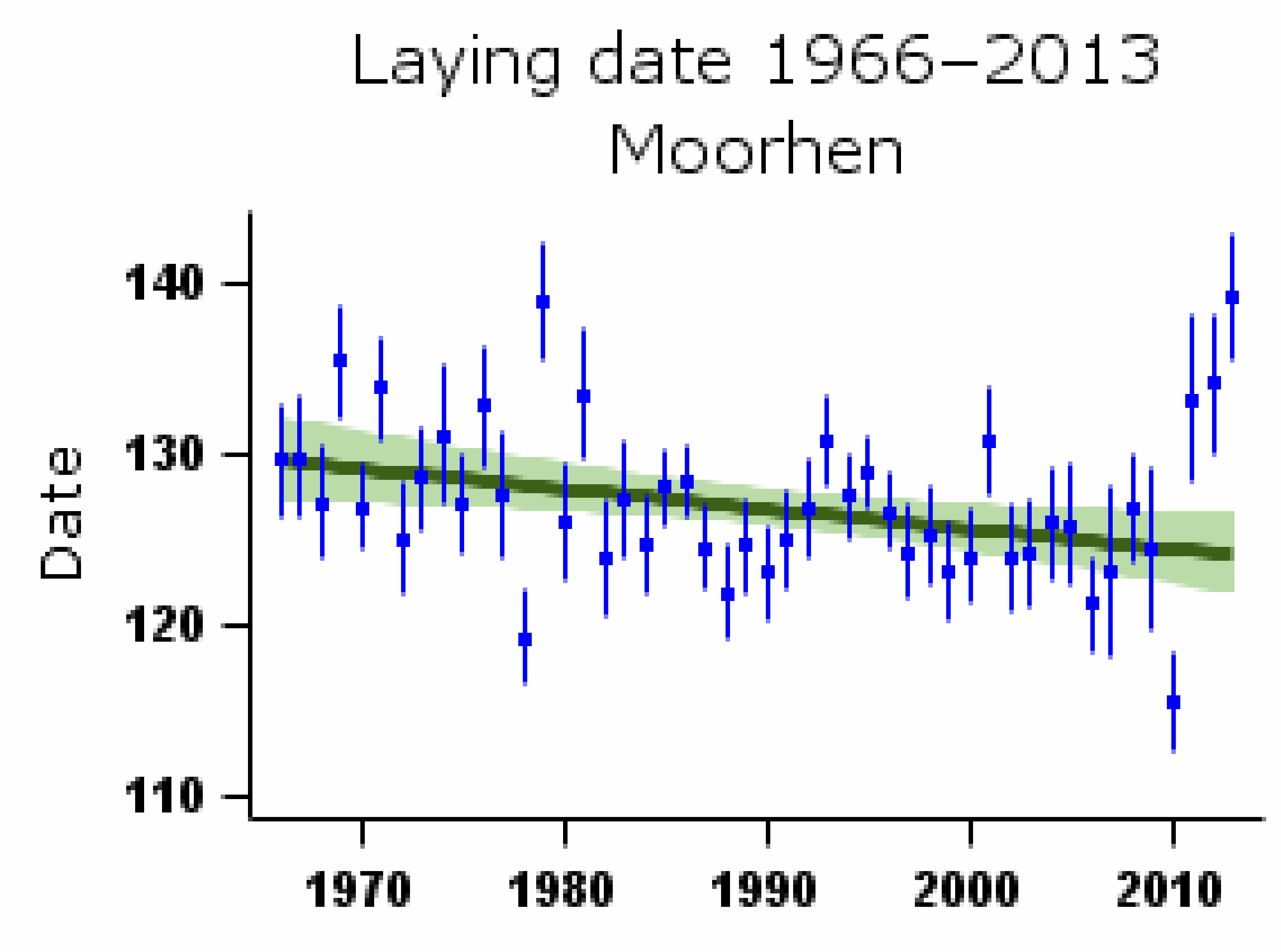


Habitat graph

Demographic trends



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

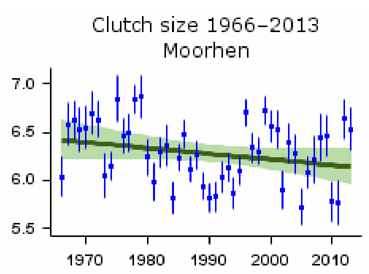


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

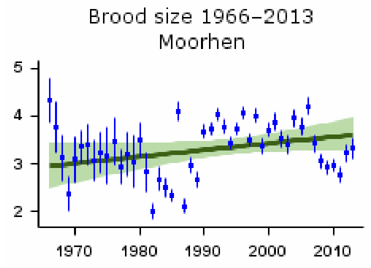
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	52	Linear decline	2.52 fledglings	2.08 fledglings	-17.5%		
Clutch size	44	1968-2012	113	None					
Brood size	44	1968-2012	108	None					
Nest failure rate at egg stage	44	1968-2012	139	Linear increase	1.09% nests/day	2.24% nests/day	105.5%		
Nest failure rate at chick stage	44	1968-2012	52	Linear increase	0.04% nests/day	0.19% nests/day	375.0%		
Laying date	44	1968-2012	82	Linear decline	May 9	May 4	-5 days		

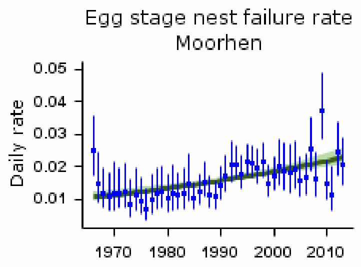
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



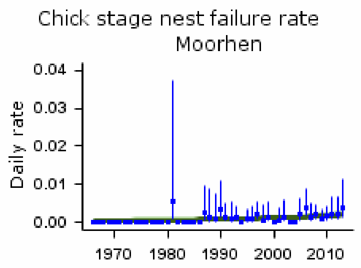
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



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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Coot

Fulica atra

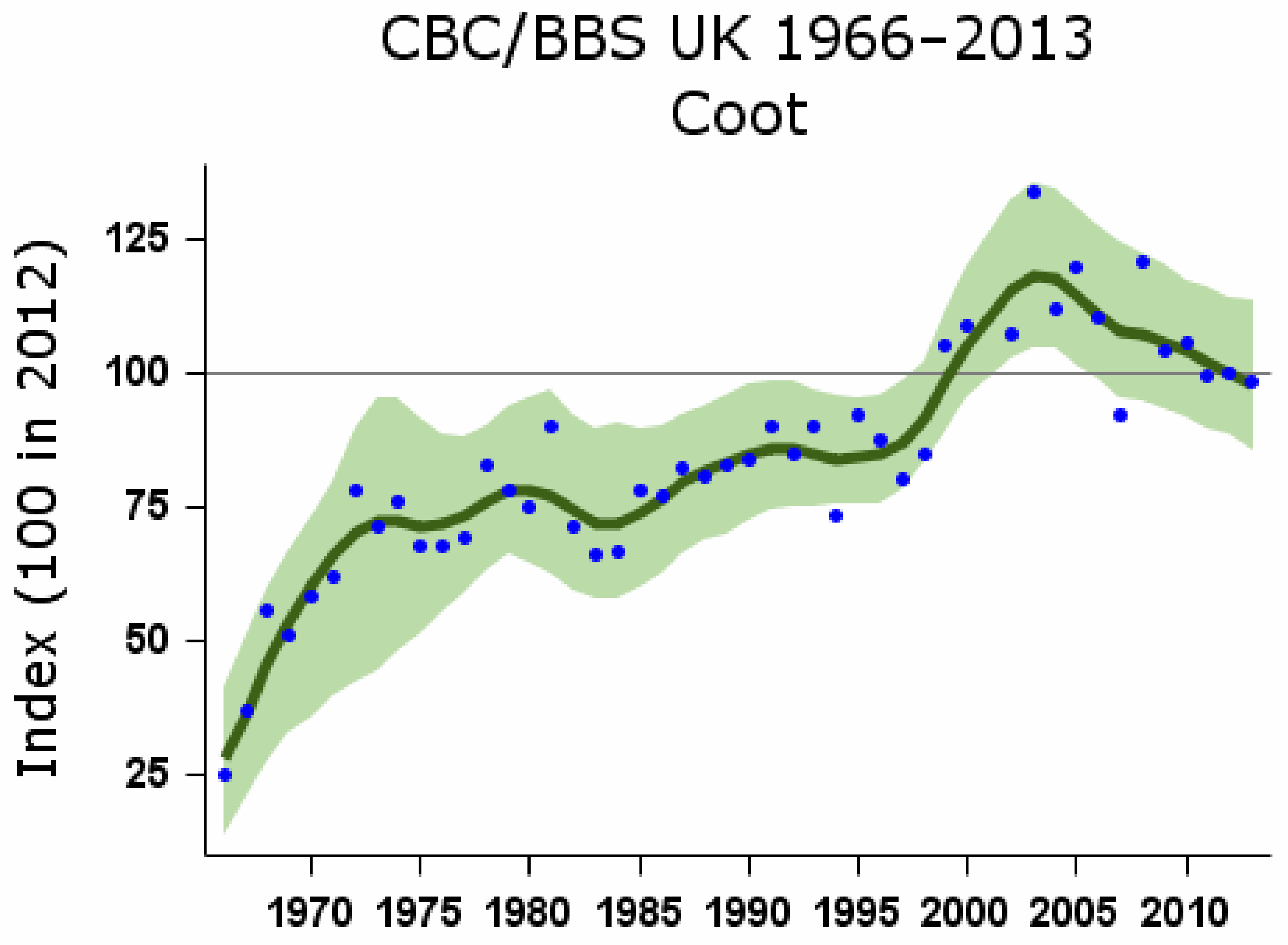
Key facts

Conservation listings:	Europe: no SPEC category (favourable conservation status in Europe, not concentrated in Europe) (BiE04) UK: green (BoCC3)
Long-term trend:	UK, England: 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 shallow increase found by BBS observers since 1994. The five-year trend is downward in all indices. The combination of CBC and BBS data suggests that the long-term increase in the UK and England has been rapid. There has been widespread moderate increase across Europe since 1980, though with little change since 1990 except for a downturn after 2008 (PECBMS 2014a). 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 (Austin et al. 2014).



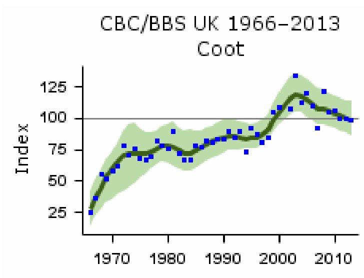
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

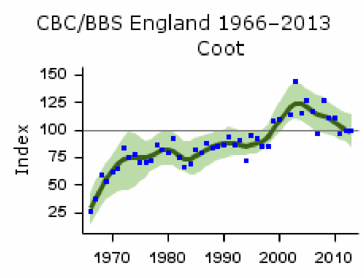
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	45	1967-2012	128	173	73	447		Small CBC sample
	25	1987-2012	208	26	0	67		Small CBC sample
	10	2002-2012	311	-14	-23	-1		
	5	2007-2012	340	-7	-18	4		
CBC/BBS England	45	1967-2012	116	161	67	513		Small CBC sample
	25	1987-2012	188	21	-3	66		Small CBC sample
	10	2002-2012	282	-17	-28	-4		
	5	2007-2012	308	-12	-22	-2		
WBS/WBBS waterways	37	1975-2012	61	72	12	206		
	25	1987-2012	76	16	-23	81		
	10	2002-2012	95	-3	-27	26		
	5	2007-2012	80	-15	-29	1		
BBS UK	17	1995-2012	273	24	7	48		
	10	2002-2012	311	-13	-25	1		
	5	2007-2012	340	-8	-19	4		
BBS England	17	1995-2012	247	21	1	40		
	10	2002-2012	282	-17	-28	-4		
	5	2007-2012	308	-12	-22	-3		

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

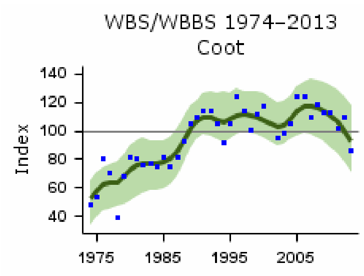
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



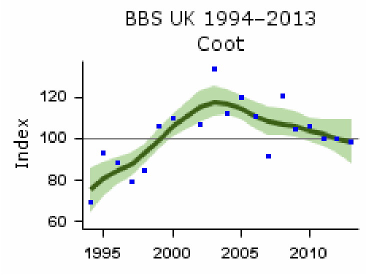
CBC/BBS UK graph



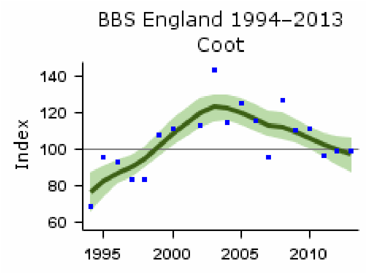
CBC/BBS England graph



WBS/WBBS waterways graph

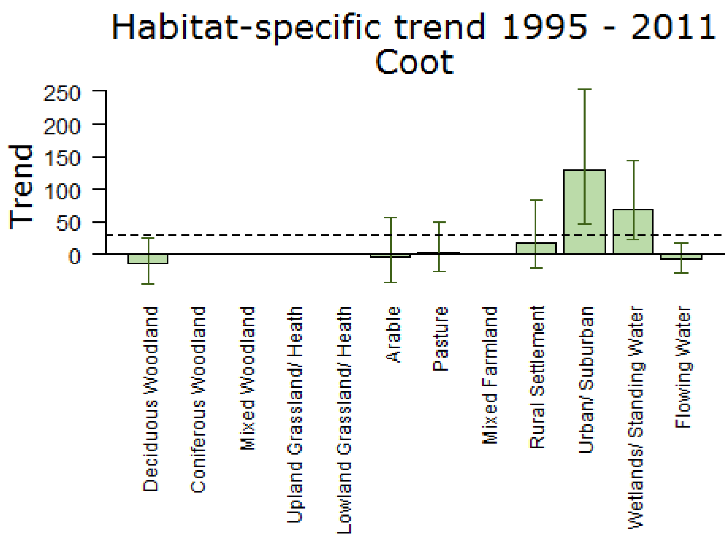


BBS UK graph



BBS England graph

Population trends by habitat



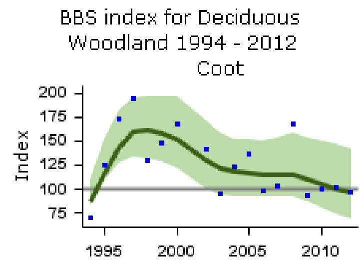
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

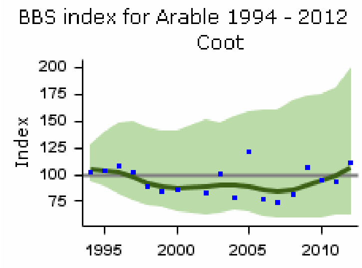
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	48	-14	-44	26
Arable	16	1995-2011	37	-4	-42	58
Pasture	16	1995-2011	77	4	-26	51
Rural Settlement	16	1995-2011	41	18	-20	83
Urban/ Suburban	16	1995-2011	30	129	48	253
Wetlands/ Standing Water	16	1995-2011	53	70	22	143
Flowing Water	16	1995-2011	127	-6	-27	19

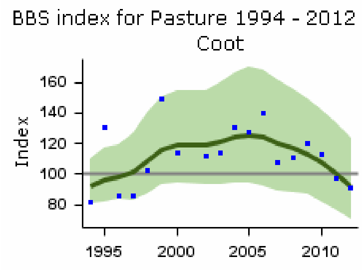
Further information on habitat-specific trends, please follow link here.



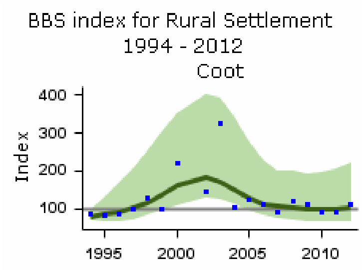
Habitat graph



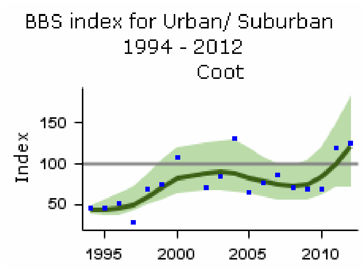
Habitat graph



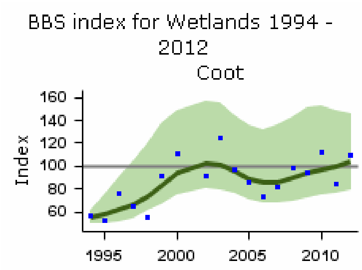
Habitat graph



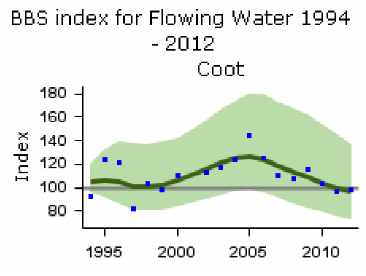
Habitat graph



Habitat graph



Habitat graph



Habitat 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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Oystercatcher

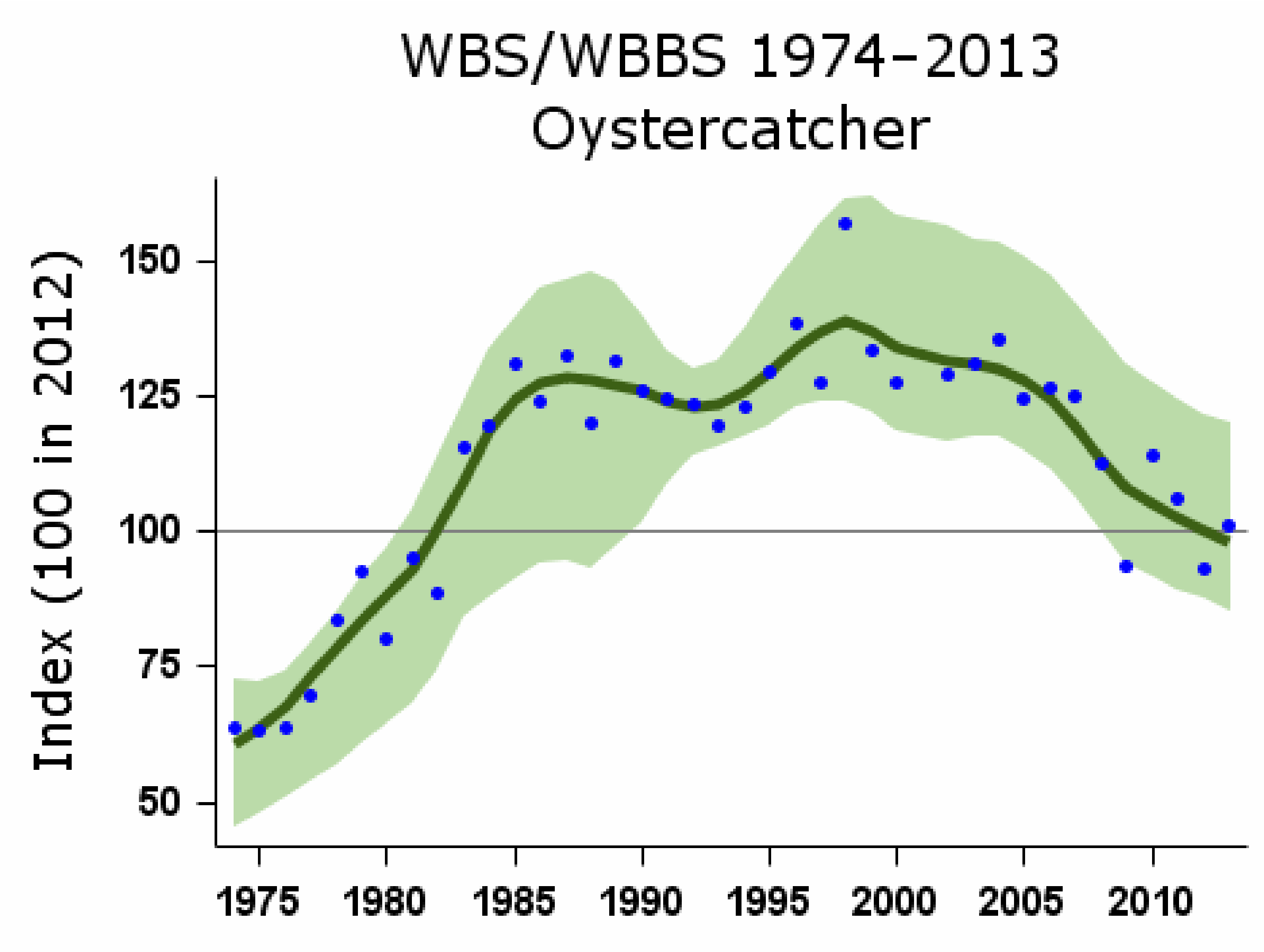
Haematopus ostralegus

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 (Austin et al. 2014). 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 may be linked to recent climate change (Crick & Sparks 1999). There have been widespread moderate declines across Europe since 1980 (PECBMS 2014a).



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

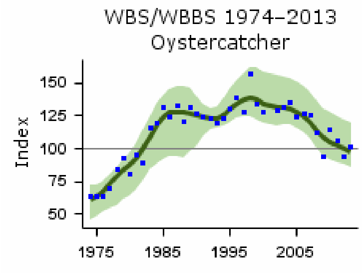
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
WBS/WBBS waterways	37	1975-2012	48	57	21	152		
	25	1987-2012	62	-22	-41	28		
	10	2002-2012	95	-24	-33	-13		

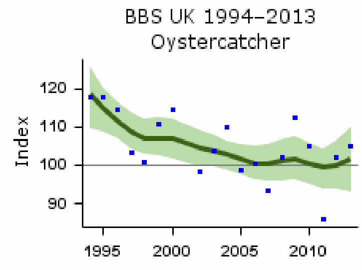
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	5	2007-2012	87	-16	-24	-6		
BBS UK	17	1995-2012	336	-13	-21	-4		
	10	2002-2012	386	-4	-14	6		
	5	2007-2012	445	0	-10	8		
BBS England	17	1995-2012	185	57	37	80		
	10	2002-2012	225	26	10	39		
	5	2007-2012	269	12	3	21		
BBS Scotland	17	1995-2012	133	-26	-36	-18	>25	
	10	2002-2012	140	-12	-21	-1		
	5	2007-2012	153	-5	-16	4		

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

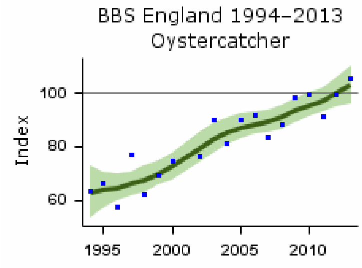
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



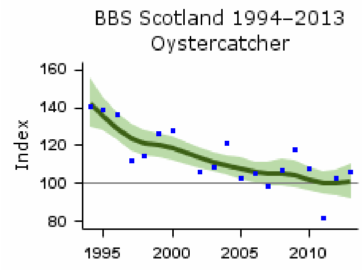
WBS/WBBS waterways graph



BBS UK graph



BBS England graph

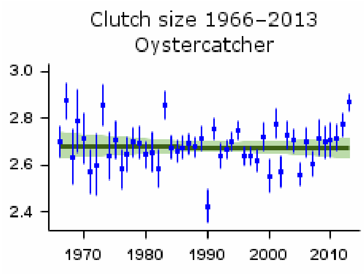


BBS Scotland graph

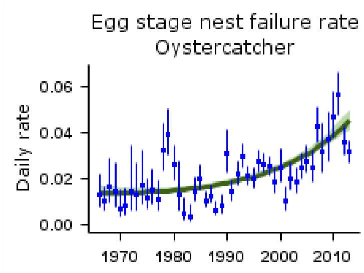
Demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Clutch size	44	1968-2012	149	None					
Nest failure rate at egg stage	44	1968-2012	164	Curvilinear	1.41% nests/day	4.31% nests/day	205.7%		
Laying date	44	1968-2012	67	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



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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Golden Plover

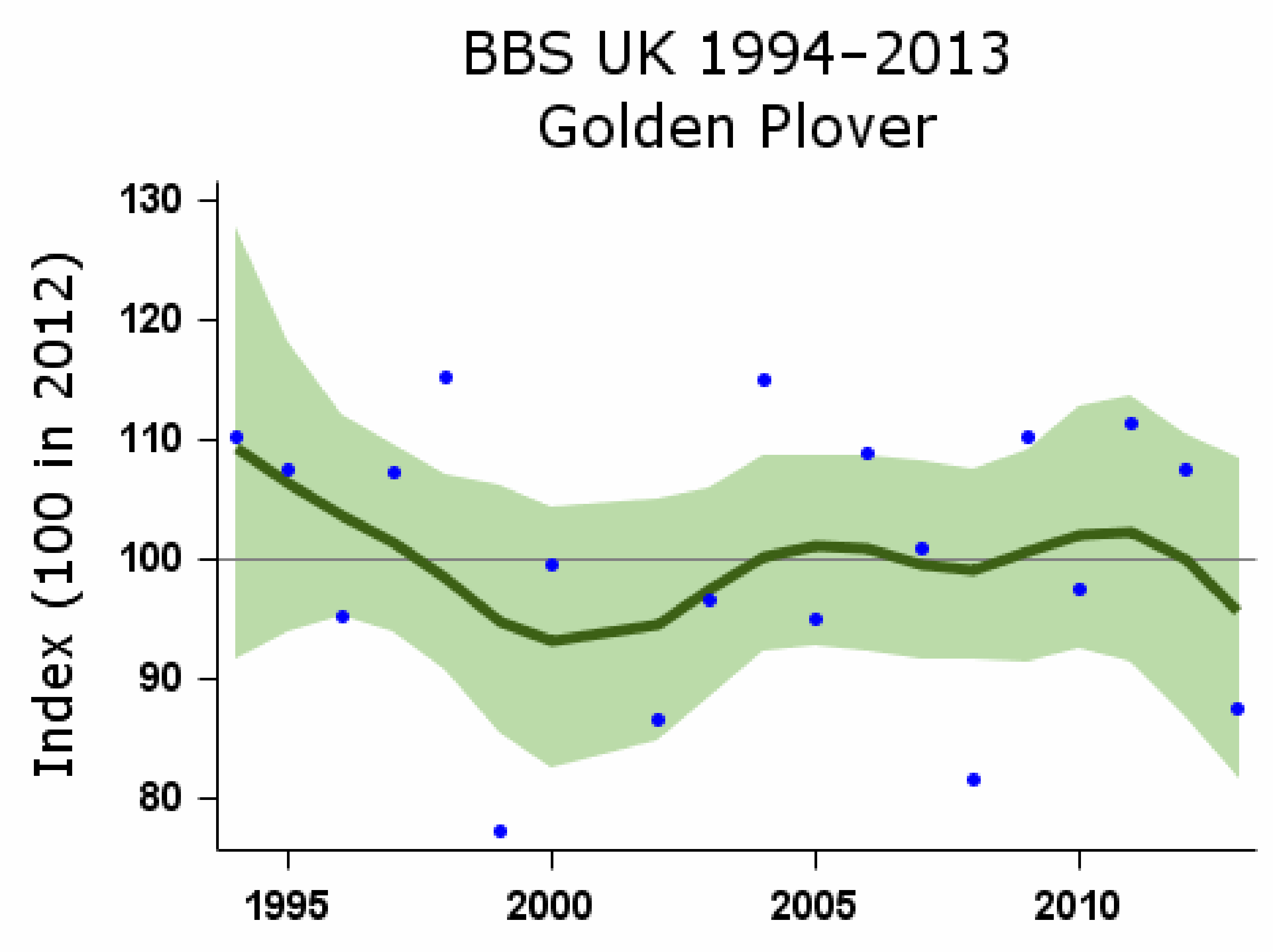
Pluvialis apricaria

Key facts

Conservation listings:	Europe: no SPEC category (concentrated in Europe, conservation status favourable) (BiE04) UK: amber (>20% East Atlantic Flyway population in winter) (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). Clutch size has decreased slightly, though 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) and it is likely that the effects of climatic warming on cranefly (tipulid) populations will cause northward contraction of the Golden Plover's range (Pearce-Higgins et al. 2010). There has been little long-term change across Europe since 1981 (PECBMS 2014a). 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 (Austin et al. 2014); 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

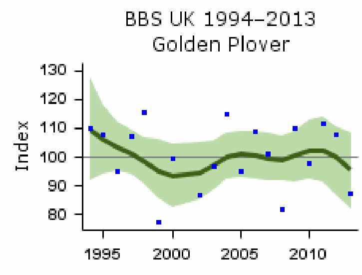
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	17	1995-2012	64	-6	-23	15		

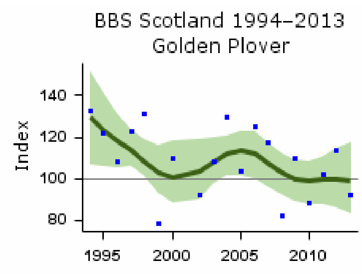
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	10	2002-2012	68	6	-15	31		
	5	2007-2012	81	0	-15	18		
BBS Scotland	17	1995-2012	38	-19	-36	3		
	10	2002-2012	33	-3	-28	25		
	5	2007-2012	31	-7	-27	19		

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

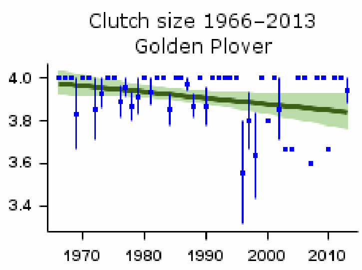


BBS Scotland graph

Demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Clutch size	44	1968-2012	12	Linear decline	3.97 eggs	3.84 eggs	-3.2%		Small sample
Nest failure rate at egg stage	44	1968-2012	6	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

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Lapwing

Vanellus vanellus

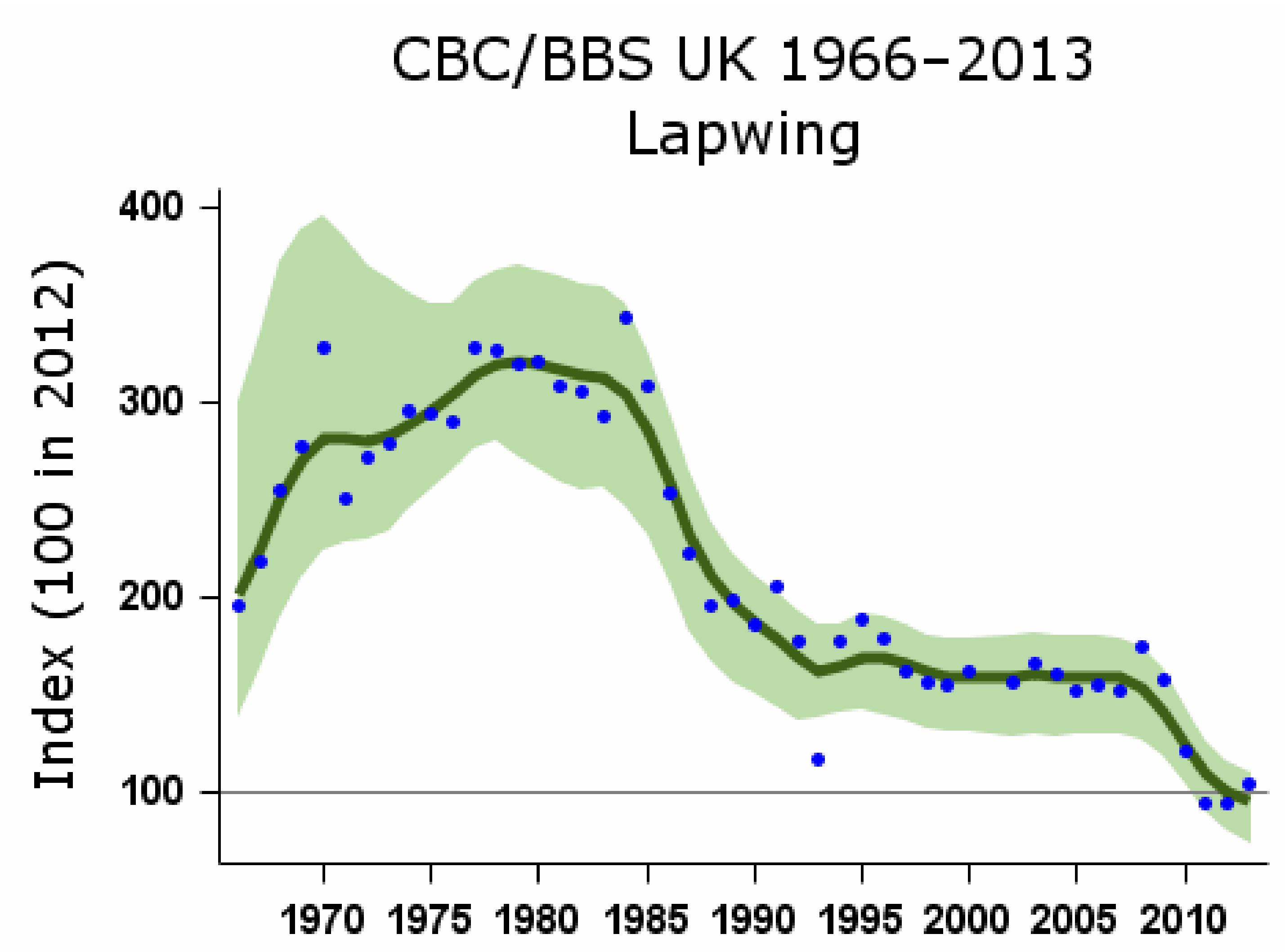
Key facts

Conservation listings:	Europe: SPEC category 2 (vulnerable) (BiE04) UK: red (BoCC3) UK Biodiversity Action Plan: priority species
Long-term trend:	UK: rapid decline England: moderate 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 (Wilsonet al. 2001, 2005). The BBS Austinet al. 2014); 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, 2014a). 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	45	1967-2012	310	-56	-76	-31	>50	
	25	1987-2012	509	-57	-66	-44	>50	
	10	2002-2012	763	-37	-42	-31	>25	
	5	2007-2012	818	-37	-44	-29	>25	
CBC/BBS England	45	1967-2012	260	-37	-65	-5	>25	
	25	1987-2012	426	-45	-58	-28	>25	
	10	2002-2012	651	-30	-36	-23	>25	
	5	2007-2012	705	-30	-34	-25	>25	
WBS/WBBS waterways	32	1980-2012	69	-52	-76	-21	>50	
	25	1987-2012	77	-69	-81	-55	>50	
	10	2002-2012	108	-50	-59	-42	>50	
	5	2007-2012	93	-34	-48	-22	>25	
BBS UK	17	1995-2012	689	-42	-50	-35	>25	
	10	2002-2012	763	-35	-42	-28	>25	
	5	2007-2012	818	-35	-42	-26	>25	
BBS England	17	1995-2012	578	-25	-32	-18		
	10	2002-2012	651	-29	-35	-24	>25	
	5	2007-2012	705	-30	-34	-25	>25	
BBS Scotland	17	1995-2012	89	-57	-65	-47	>50	
	10	2002-2012	89	-41	-51	-30	>25	
	5	2007-2012	93	-42	-52	-28	>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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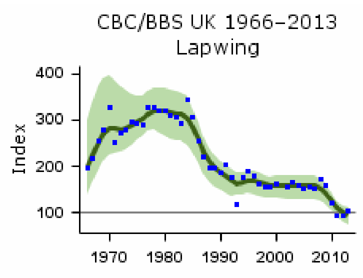
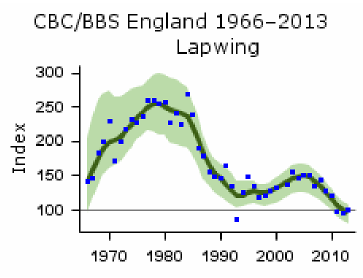
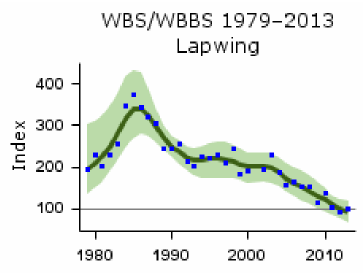


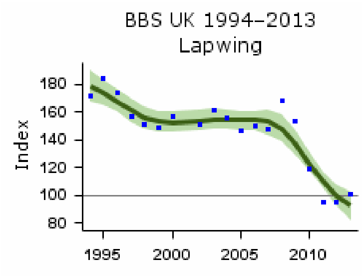
CBC/BBS UK graph



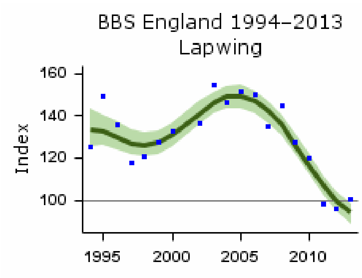
CBC/BBS England graph



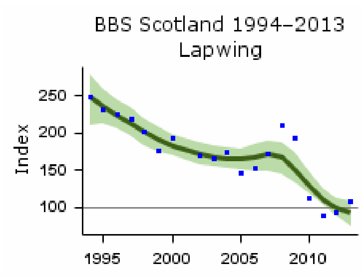
WBS/WBBS waterways graph



BBS UK graph



BBS England graph

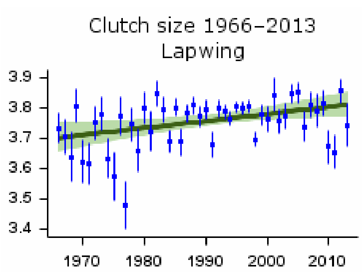


BBS Scotland graph

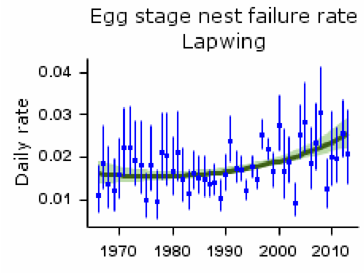
Demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Clutch size	44	1968-2012	192	Linear increase	3.71 eggs	3.81 eggs	2.7%		
Nest failure rate at egg stage	44	1968-2012	212	Curvilinear	1.58% nests/day	2.48% nests/day	57.0%		
Laying date	44	1968-2012	47	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

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	Decreased survival
Ecological	Agricultural intensification	

Further information on causes of change

The decline of the Lapwing exemplifies how different factors can combine to cause population change (Robinson et al. 2014). The decrease in the 1980s was due to a period of low survival, when annual life expectancy decreased from 7 years to just 4.5 years, caused by a series of cold winters. At the same time, though, average nest survival decreased markedly, meaning the population could not recover from what would normally have been only a temporary setback.

There is a good deal of research supporting the hypothesis that habitat loss and degradation due to the intensification of farming have reduced 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 also 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).

Declines among Lapwings are unlikely to be ameliorated by either habitat improvement or predator control in isolation (Bodey et al. 2011, Smart et al. 2013).

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. 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 monitored at intervals by special surveys. 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 first 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 (Austin et al. 2014).

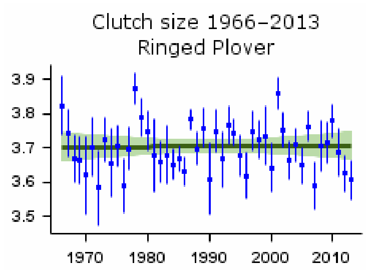
Population changes in detail

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

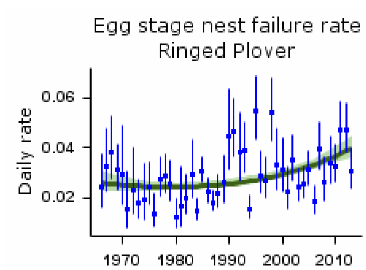
Demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Clutch size	44	1968-2012	93	None					
Nest failure rate at egg stage	44	1968-2012	126	Curvilinear	2.54% nests/day	3.87% nests/day	52.4%		
Laying date	44	1968-2012	41	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

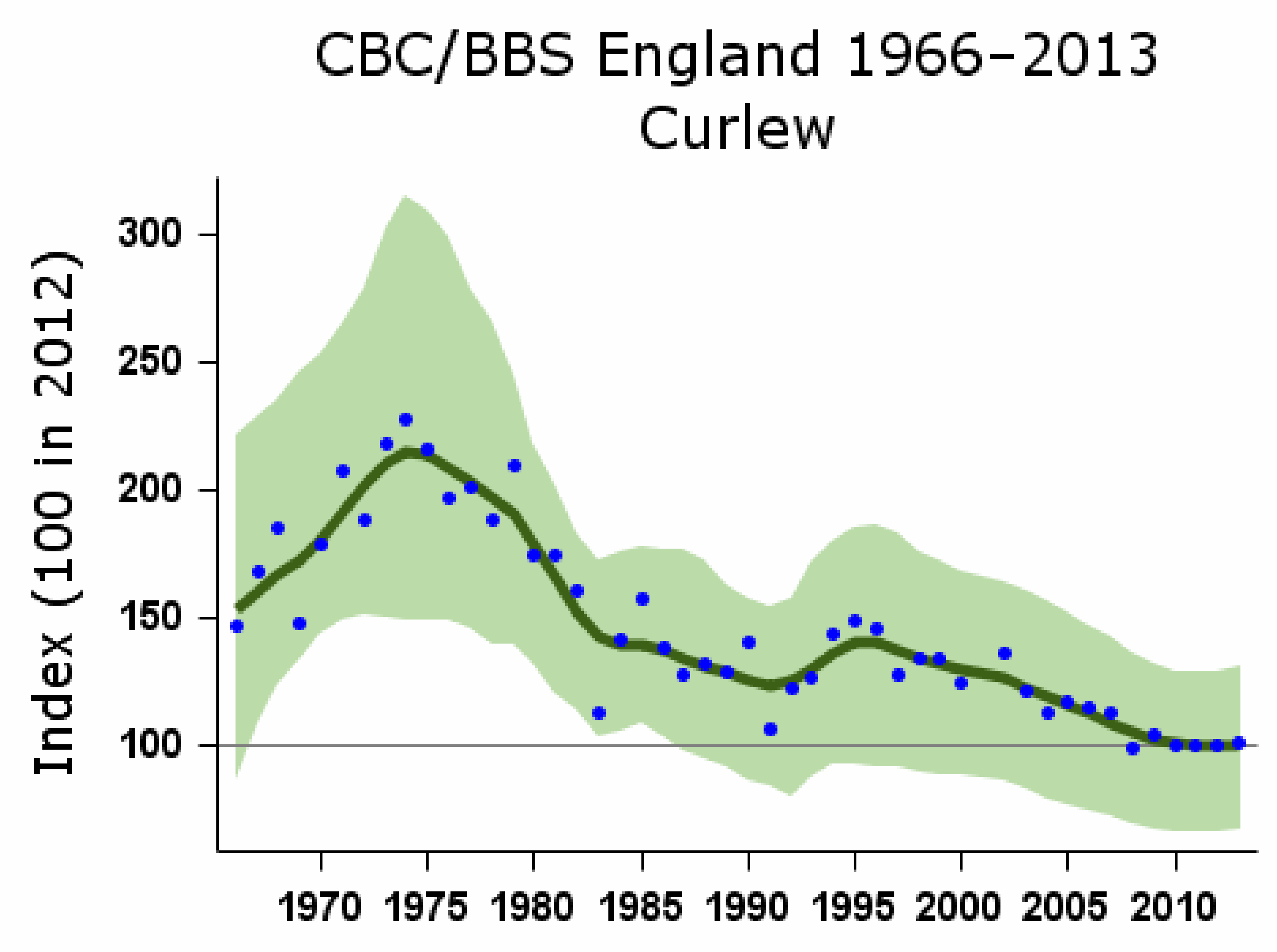
Conservation listings:	Global: Near Threatened (BiE04) UK: amber (>20% of European breeding and winter populations) (BoCC3) UK Biodiversity Action Plan: priority species
Long-term trend:	England: moderate decline
Population size:	68,000 pairs in 2009 (APEP13: 1985-99 estimate (O'Brien 2004) updated using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

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

Status summary

CBC and BBS reveal a long-term decline, despite an initial increase that lasted until the mid 1970s. At WBS/WBBS sites, in contrast, the downturn did not begin until the late 1990s, suggesting there may have been some movement during the 1980s and 1990s from farmland onto wetter sites. Surveys of lowland wet grassland, however, showed Curlew losses of almost 39% between 1982 and 2002, more specifically of 34% in England and 75% in Wales (Wilson et al. 2004, 2005a). A 2006 survey in Wales highlighted the rapid decline of the species across all habitats, with low breeding success as a plausible mechanism (Johnstone et al. 2007). In Northern Ireland, surveys in the mid 1980s and 1999 highlighted that Curlew breeding numbers had declined by 58% (Henderson et al. 2002). Breeding Curlews had declined significantly between 1980 and 2002 in six of 13 upland study areas across Britain (Sim et al. 2005).

The BBS Austin et al. 2014). There has been widespread moderate decline across Europe since 1980 (PECBMS 2014a).



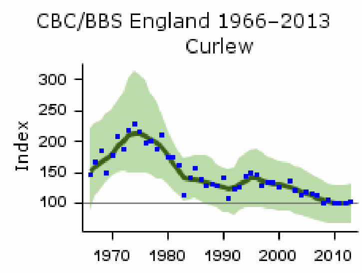
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

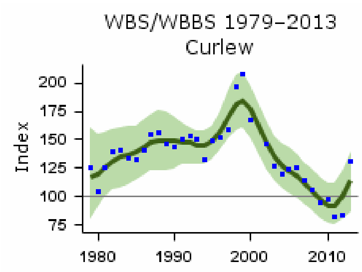
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	45	1967-2012	144	-38	-78	20		Small CBC sample
	25	1987-2012	247	-25	-51	4		Small CBC sample
	10	2002-2012	382	-21	-28	-13		
	5	2007-2012	454	-8	-13	-4		
WBS/WBBS waterways	32	1980-2012	45	-17	-48	48		
	25	1987-2012	52	-32	-56	6		
	10	2002-2012	76	-32	-44	-21	>25	
	5	2007-2012	70	-11	-23	3		
BBS UK	17	1995-2012	522	-43	-48	-35	>25	
	10	2002-2012	560	-27	-35	-18	>25	
	5	2007-2012	637	-8	-13	-2		
BBS England	17	1995-2012	338	-30	-37	-23	>25	
	10	2002-2012	382	-21	-27	-13		
	5	2007-2012	454	-8	-13	-3		
BBS Scotland	17	1995-2012	126	-55	-62	-46	>50	
	10	2002-2012	124	-35	-49	-24	>25	
	5	2007-2012	135	-13	-23	1		
BBS Wales	17	1995-2012	35	-56	-71	-37	>50	
	10	2002-2012	33	-36	-54	-16	>25	

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

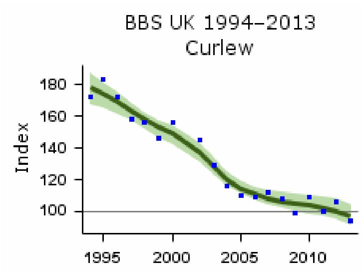
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



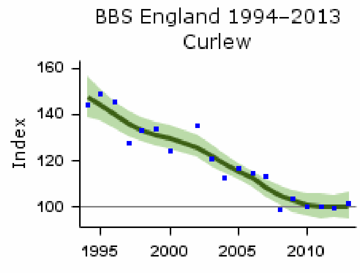
CBC/BBS England graph



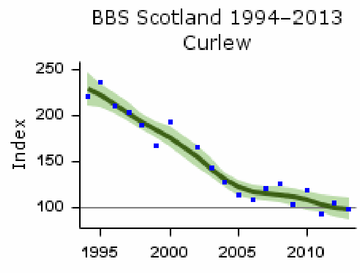
WBS/WBBS waterways graph



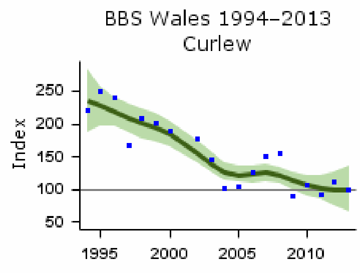
BBS UK graph



BBS England graph



BBS Scotland graph

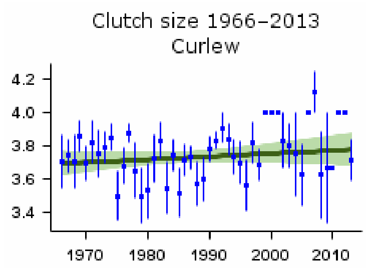


BBS Wales graph

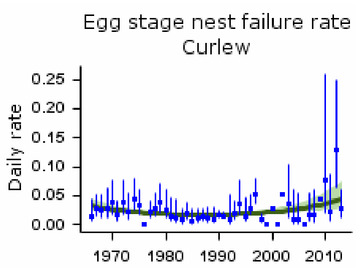
Demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Clutch size	44	1968-2012	20	None					Small sample
Nest failure rate at egg stage	44	1968-2012	21	Curvilinear	2.90% nests/day	4.17% nests/day	43.8%		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 loss of habitat is the main cause of decline of Curlew. Decline of the species on grassland is likely to be correlated to draining of fields, whilst predation is likely to be important at a site level. The decline of Curlew recorded by WBS/WBBS may be related to other causes, such as land reclamation but data are not available. The conservation of Curlew is likely to benefit from wader-friendly management of land, including restoration of ditches, wet features within fields and heterogeneous vegetation. Further studies should concentrate on investigating the direct link between Curlew abundance and management of coastal areas, including the outcome of displacement of individuals from feeding sites on mudflats.

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

Further information on causes of change

Habitat change is the main cause of decline that has been identified, in particular drainage of grassland and management changes in the uplands. Loss of peatland, drainage of wetlands and afforestation have been suggested as the main causes of decline in Ireland (Partridge & Smith 1992). In a Northern Irish study, the preferred habitat for Curlew was bog/mire and unimproved grassland, with areas of standing water, whilst the species was less abundant than expected on improved grassland, upland rough grassland and arable land (Henderson et al. 2002). Amar et al. (2011) showed that, between 1980-93 and 2000-02, Curlews had declined most in heather-dominated upland sites and least in bog-dominated ones. An earlier study had found that Curlew abundance was higher on moorland managed for grouse shooting than on other moorland, probably mediated by increased predator control on grouse moors (Tharme et al. 2001): these results led to the suggestion that reduction in grouse moor, managed to favour heather regrowth and to control predators, might be behind the decline of wader populations in the uplands (Baines et al. 2008, Fletcher et al. 2010), but Amar et al. (2011) found no correlation between grouse moor and Curlew population change.

Studies of the impact of predators on Curlew abundance and breeding success have reached opposing conclusions, suggesting some case-by-case relevance of predators to local Curlew populations. A study on upland waders found no negative spatial or temporal relationship between Ravens and Curlew abundance, using surveys from 1980 and 1993 repeated in 2000 and 2002 (Amar et al. 2010b). In contrast, control of foxes and crows on two moorland and marginal farmland plots in Northumberland increased breeding success from 15% to 50%, with an increase of 14% per annum in breeding numbers after a three-year lag (Fletcher et al. 2010). Predation was identified as the primary proximate cause of failure in up to 97% of nests in a study during 1993-95 on Curlews breeding in marginal farmland and agriculturally improved grassland in Northern Ireland, with higher daily failure rates during the egg-laying period than during incubation (Grant et al. 1999). On Shetland, no evidence was found of a relationship between Curlew and predator abundance over 40 farms participating in the Agri-Environment Scheme (AES) (van der Wal & Palmer 2008). In Sweden, Curlew nest predation rates were higher in mixed farm landscapes than in arable ones (Berg 1992).

It has been suggested that Curlews and other breeding waders are becoming increasingly restricted to sites managed as nature reserve or under the higher tiers of AES (Ausden & Hirons 2002, Wilson et al. 2004, 2007, O'Brien & Wilson 2011). Some authors have found potential benefits of AES for Curlews and other waders, e.g. where stocking densities have been reduced (van der Wal & Palmer 2008), but others have found that the benefits of AES are not always apparent or do not apply to all wader species (O'Brien & Wilson 2011, Smart et al. 2013). Nevertheless, conservation of Curlew is likely to benefit from wader-friendly management of land, including restoration of ditches, of wet features within fields and of vegetation diversity.

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Common Sandpiper

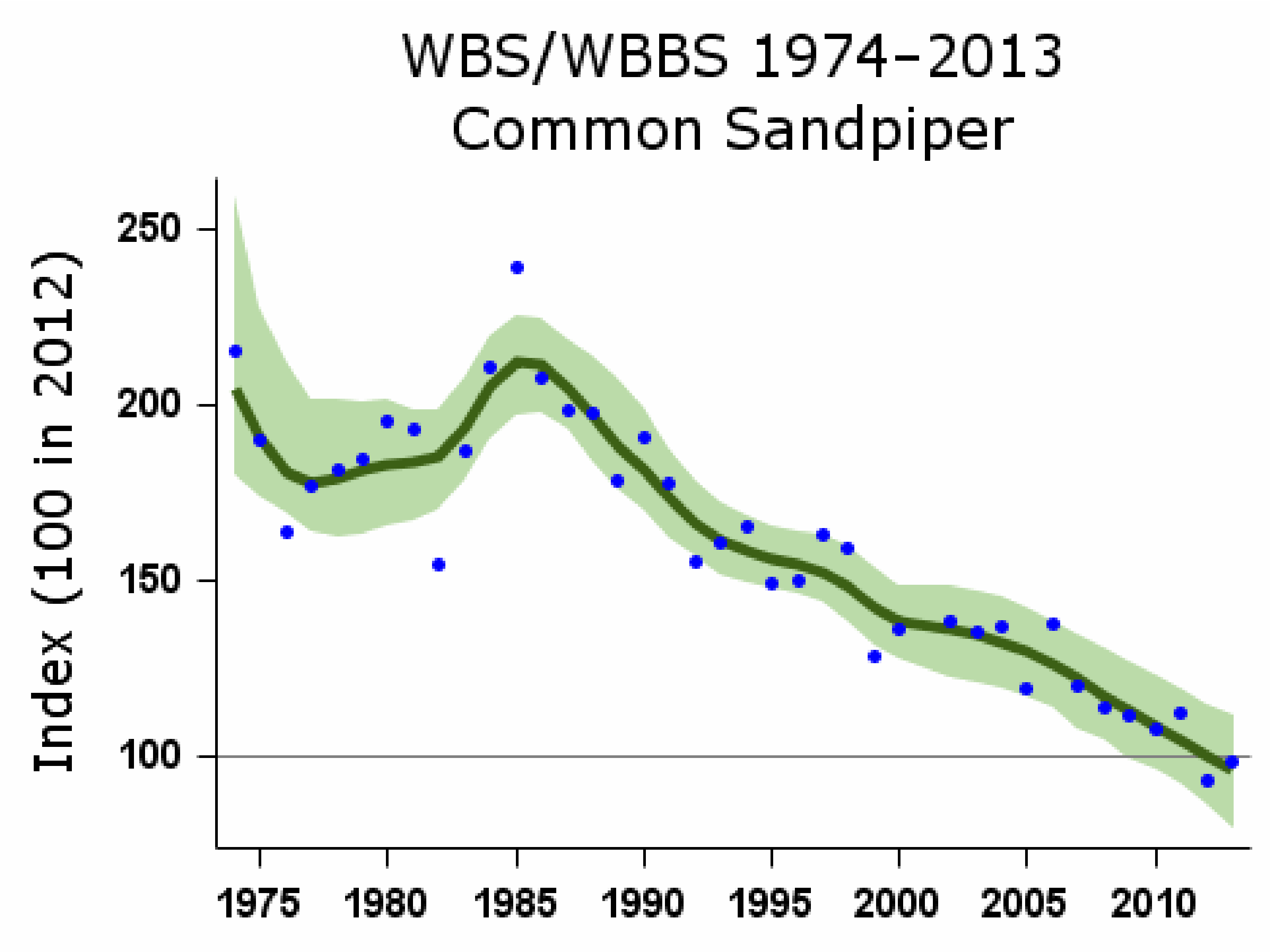
Actitis hypoleucos

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, though decreases are less evident in BBS squares. 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 has occurred across Europe since 1980 (PECBMS 2014a). The species was moved from the green to the amber list in 2009 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	37	1975-2012	48	-48	-63	-35	>25	
	25	1987-2012	58	-51	-61	-42	>50	
	10	2002-2012	82	-26	-38	-14	>25	

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	5	2007-2012	73	-18	-28	-7		
BBS UK	17	1995-2012	68	-10	-27	8		
	10	2002-2012	69	7	-13	26		
	5	2007-2012	78	3	-13	22		
BBS England	17	1995-2012	30	-29	-57	10		
	10	2002-2012	33	-12	-35	10		
	5	2007-2012	39	15	-9	38		
BBS Scotland	17	1995-2012	33	-12	-30	11		
	10	2002-2012	30	1	-21	22		
	5	2007-2012	33	-5	-23	13		

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

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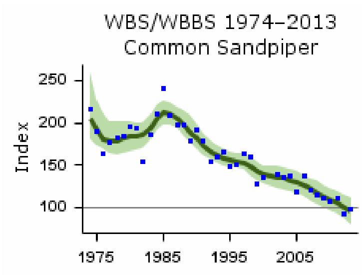
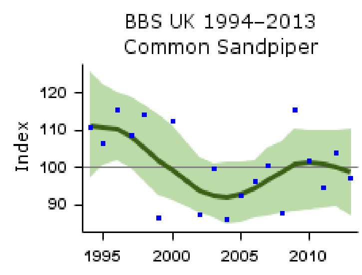
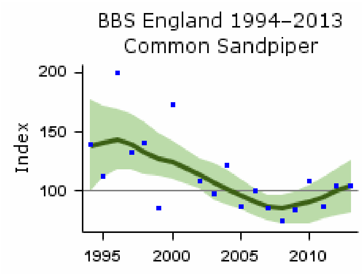


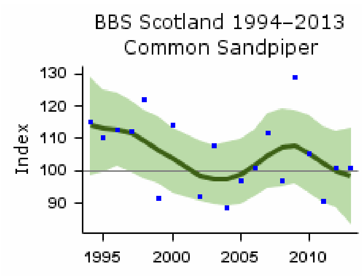
WBS/WBBS waterways graph



BBS UK graph



BBS England graph

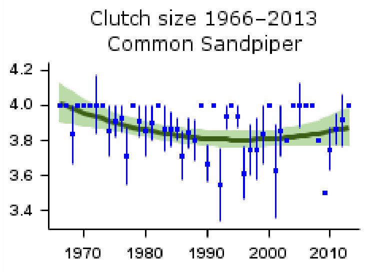


BBS Scotland graph

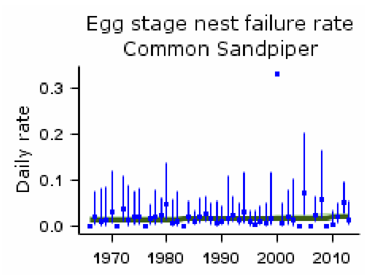
Demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Clutch size	44	1968-2012	12	Curvilinear	3.98 eggs	3.87 eggs	-2.9%		Small sample
Nest failure rate at egg stage	44	1968-2012	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

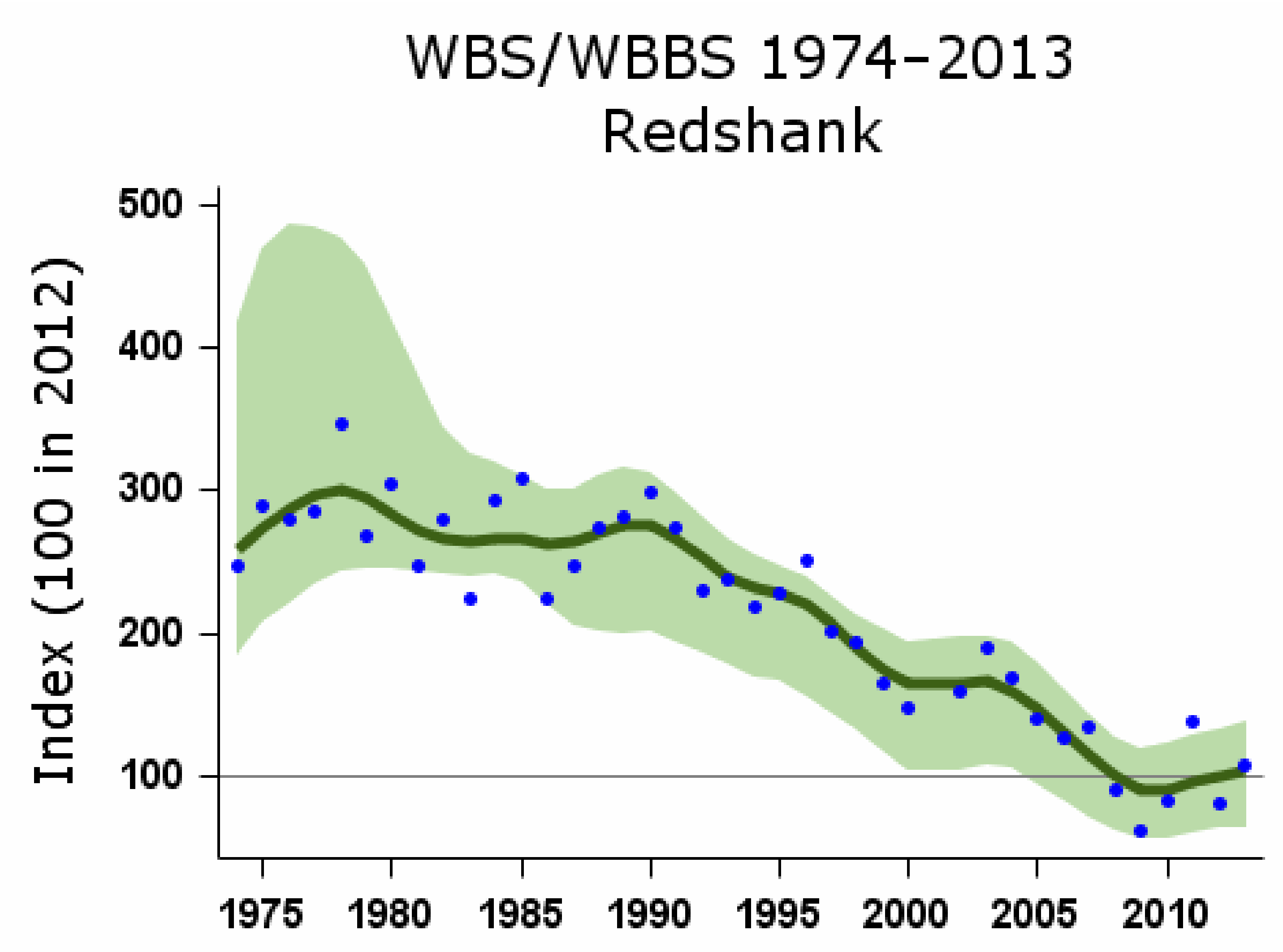
Key facts

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

Range contraction had occurred from considerable 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, with the most pronounced declines recorded in the Midlands (over 80%) the southwest (over 50%) and the north of England (over 45%) (Wilson et al. 2005a). Another survey revealed that Redshank had disappeared from half of plots in grassland marginal upland areas of Britain between the 1970s and 1999-2000 (Henderson et al. 2004). 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). By 2011, fewer than 12,000 breeding pairs remained on saltmarshes, a decrease of 53% from the 1985 survey: a better understanding of saltmarsh grazing practices and longer-term management of this habitat is urgently needed (Malpas et al. 2013). 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 (Austin et al. 2014). The success of nests at the egg stage has risen steeply since the 1960s.

In 2009, UK population decline was added to the criteria by which Redshank qualifies for amber listing; the scale of decline reported here already meets the red-list criterion, however. Numbers have shown widespread moderate decline across Europe since 1980 (PECBMS 2014a).



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	37	1975-2012	24	-64	-88	-40	>50	
	25	1987-2012	26	-62	-77	-42	>50	
	10	2002-2012	30	-40	-52	-11	>25	
	5	2007-2012	25	-13	-30	19		
BBS UK	17	1995-2012	86	-44	-59	-20	>25	
	10	2002-2012	94	-31	-44	-14	>25	
	5	2007-2012	102	-26	-39	-11	>25	
BBS England	17	1995-2012	61	-28	-44	-7	>25	
	10	2002-2012	69	-35	-49	-21	>25	
	5	2007-2012	78	-13	-25	0		

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

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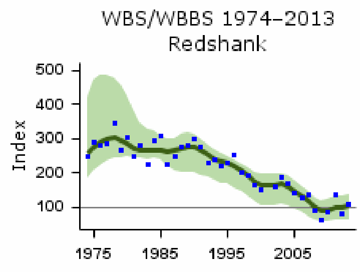
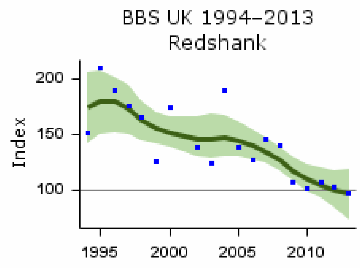
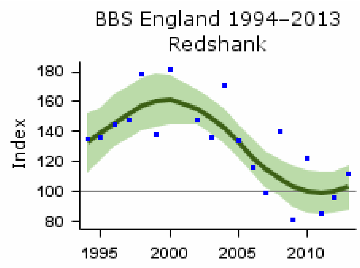


WBS/WBBS waterways graph



BBS UK graph

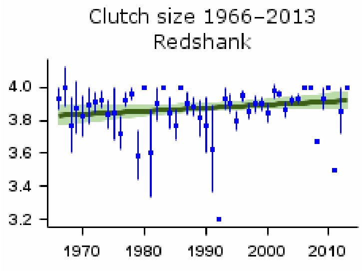


BBS England graph

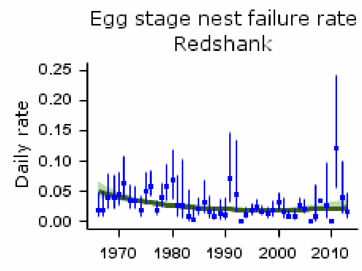
Demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Clutch size	44	1968-2012	28	None					Small sample
Nest failure rate at egg stage	44	1968-2012	30	Curvilinear	4.51% nests/day	2.27% nests/day	-49.7%		
Laying date	44	1968-2012	8	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 to suggest that Redshank decline is related to changes in habitat management, in particular drainage and agricultural intensification. Where birds still nest in wet meadows, a suggested solution includes manipulating water levels, reducing grazing and suspending agricultural operations during the nesting period.

Change factor	Primary driver	Secondary driver
Demographic	Unknown	
Ecological	Agricultural intensification	

Further information on causes of change

Agricultural intensification has been associated with the decrease of several grassland breeding wader species (Wilson et al. 2004, 2005a). Conversion of grassland to arable cultivation (Robinson & Sutherland 2002) and grassland intensification, such as reseeding, use of artificial fertilizers, switch from hay to silage and lowering of water levels all decrease the suitability of habitat for breeding waders (Green & Robins 1993). Grass grown for silage presents a tall, dense and uniform sward in spring that is cut earlier than hay meadows, incurring additional losses of nests and chicks (Beintema & Muskens 1987, Kruk et al. 1996, Vickery et al. 2001, Atkinson et al. 2004). Grassland intensification and land drainage have resulted in dry ground with dense, homogenous swards which are rarely used by breeding waders (Smart et al. 2006). High stocking densities bring associated risks of trampling of nests and chicks (Beintema & Muskens 1987, Green 1988), though cattle produce taller swards than sheep, hence providing a better breeding habitat for Redshank (Smart et al. 2006). Studies of godwits and Lapwing have suggested that deteriorating breeding habitat makes wader nests and chicks particularly vulnerable to predators (Bolton et al. 2007, Teunissen et al. 2008, Schekkerman et al. 2009), though predation on Redshank eggs and chicks remains to be studied.

An intensive field study in Norfolk showed that density of breeding Redshank within coastal and inland grazing marshes was associated with wet features within each field: nest-site selection was associated with clumps of tall vegetation and hatching success was higher in areas of penetrable soil where this species prefers to feed (Smart et al. 2006). On coastal grassland, shallow wet features and vegetation structure have been shown to be important to several species of breeding waders (Vickery et al. 1997, Milsom et al. 2000, 2002, Eglington et al. 2008, 2010). Milsom et al. (2002) showed that adult Redshanks prefer to feed in wet rills than dry ones or on open grassland. Soil invertebrates are more accessible when water levels are just below the soil surface (Ausden et al. 2001).

In lowland England, where agricultural intensification has been intense and widespread, Redshank and other grassland-breeding waders have become restricted to areas managed as nature reserves or under agri-environment schemes (AES) (Wilson et al. 2004, 2007, Ausden & Hirons 2002). AES management can be successful in increasing breeding pairs of Redshank on grassland fields in Scotland but further studies at UK level should be carried out to understand the value of AES for Redshank populations (O'Brien & Wilson 2011).

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Woodcock

Scolopax rusticola

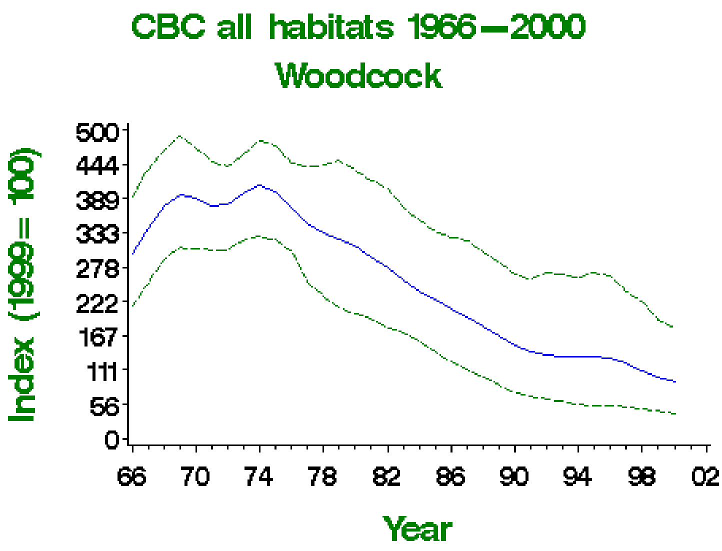
Key facts

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); 55,241 (41,806-69,004) males in 2013 (Hayhow et al. 2014)

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 clearly 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 provided a new baseline population estimate for monitoring that was much higher than previously thought (Hoodless et al. 2009; also, here). It is important to note, though, that the upward revision of the population estimate is due to new methodology and carries no information about population trends. A repeat survey of breeding Woodcocks conducted by BTO volunteers in spring 2013 found a decline of 29% since 2003 (Hayhow et al. 2014; also, Balmer et al. 2013).

The CBC decline was discounted in 2009 as a reason for the species' amber listing (BoCC3), which now rests on the breeding declines recorded across Europe, especially European Russia (BiE04). Annual numbers 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.

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CBC all habitats graph

Demographic trends

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

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Snipe

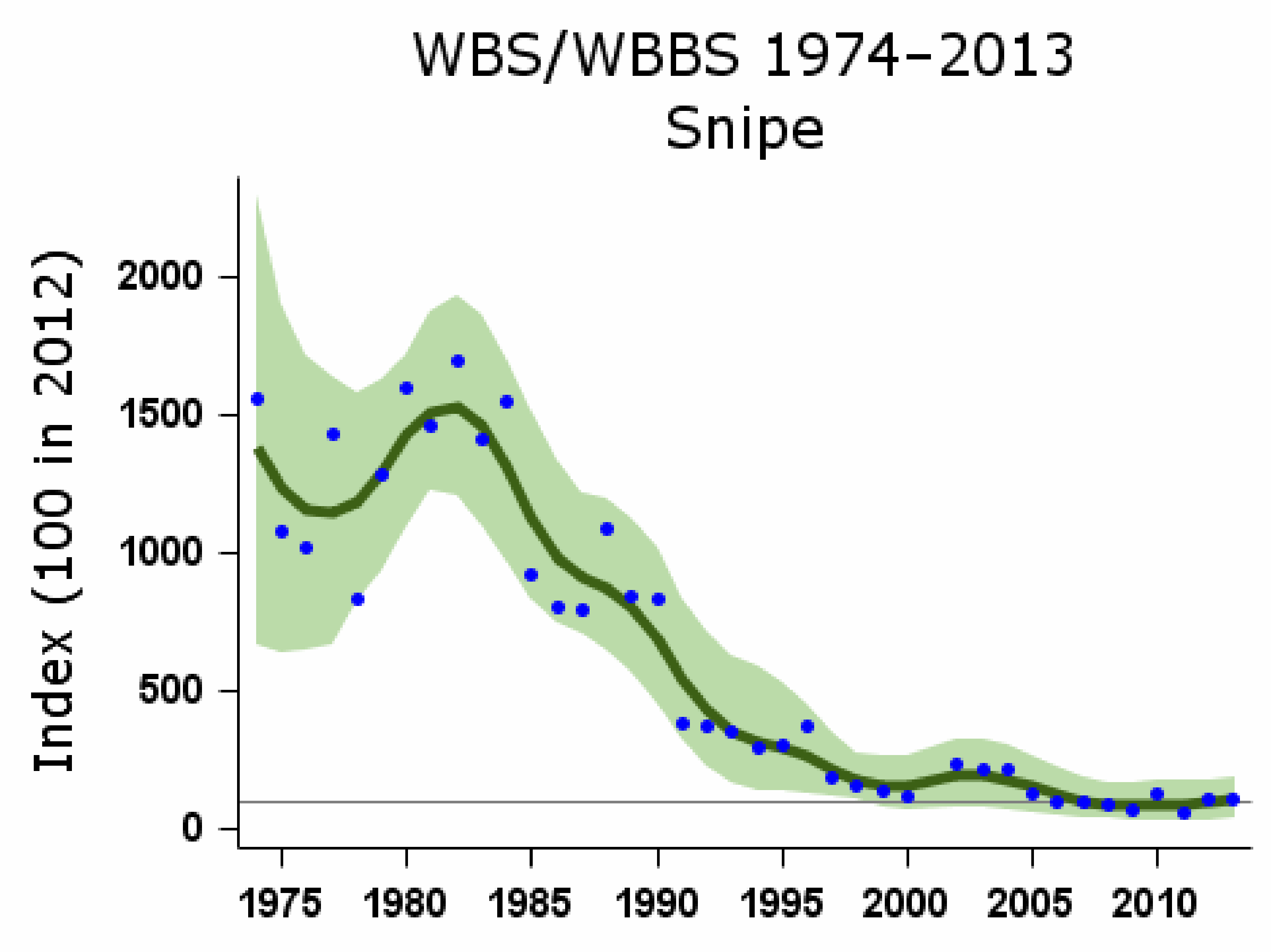
Gallinago gallinago

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 atlas work during 2008-11 confirmed that range loss or population decrease has been evident almost everywhere (Balmer et al. 2013). The BBS showed initial increases from 1994, especially in Scotland, but a sharp downturn over the recent decade. Daily nest failure rates at the egg stage appear to have halved. There has been moderate decline across Europe since 1980 (PECBMS 2014a): this previously 'secure' species in Europe 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

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
WBS/WBBS waterways	37	1975-2012	13	-92	-98	-76	>50	Small sample
	25	1987-2012	15	-89	-97	-79	>50	Small sample
	10	2002-2012	23	-48	-70	-14	>25	
	5	2007-2012	20	-2	-37	25		
BBS UK	17	1995-2012	164	11	-7	34		
	10	2002-2012	188	-25	-33	-13		
	5	2007-2012	219	-22	-33	-8		
BBS England	17	1995-2012	89	-13	-29	8		
	10	2002-2012	110	-29	-42	-16	>25	
	5	2007-2012	136	-11	-19	3		
BBS Scotland	17	1995-2012	58	13	-6	41		
	10	2002-2012	60	-26	-37	-13	>25	
	5	2007-2012	67	-29	-40	-8	>25	

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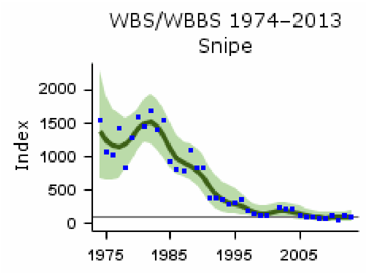
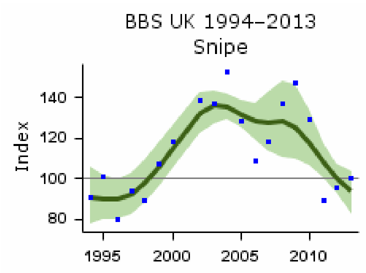
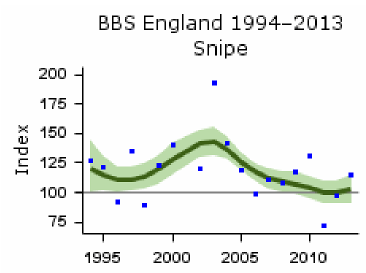


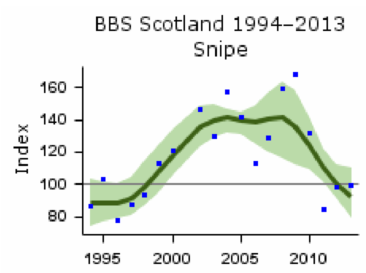
WBS/WBBS waterways graph



BBS UK graph



BBS England graph

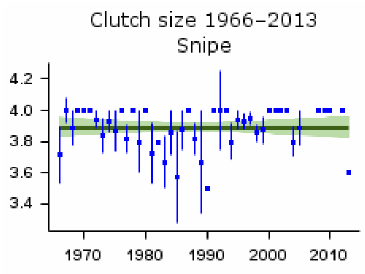


BBS Scotland graph

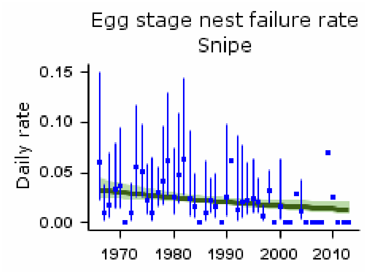
Demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Clutch size	44	1968-2012	12	None					Small sample
Nest failure rate at egg stage	44	1968-2012	14	Linear decline	3.13% nests/day	1.34% nests/day	-57.2%		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 Tern

Sterna hirundo

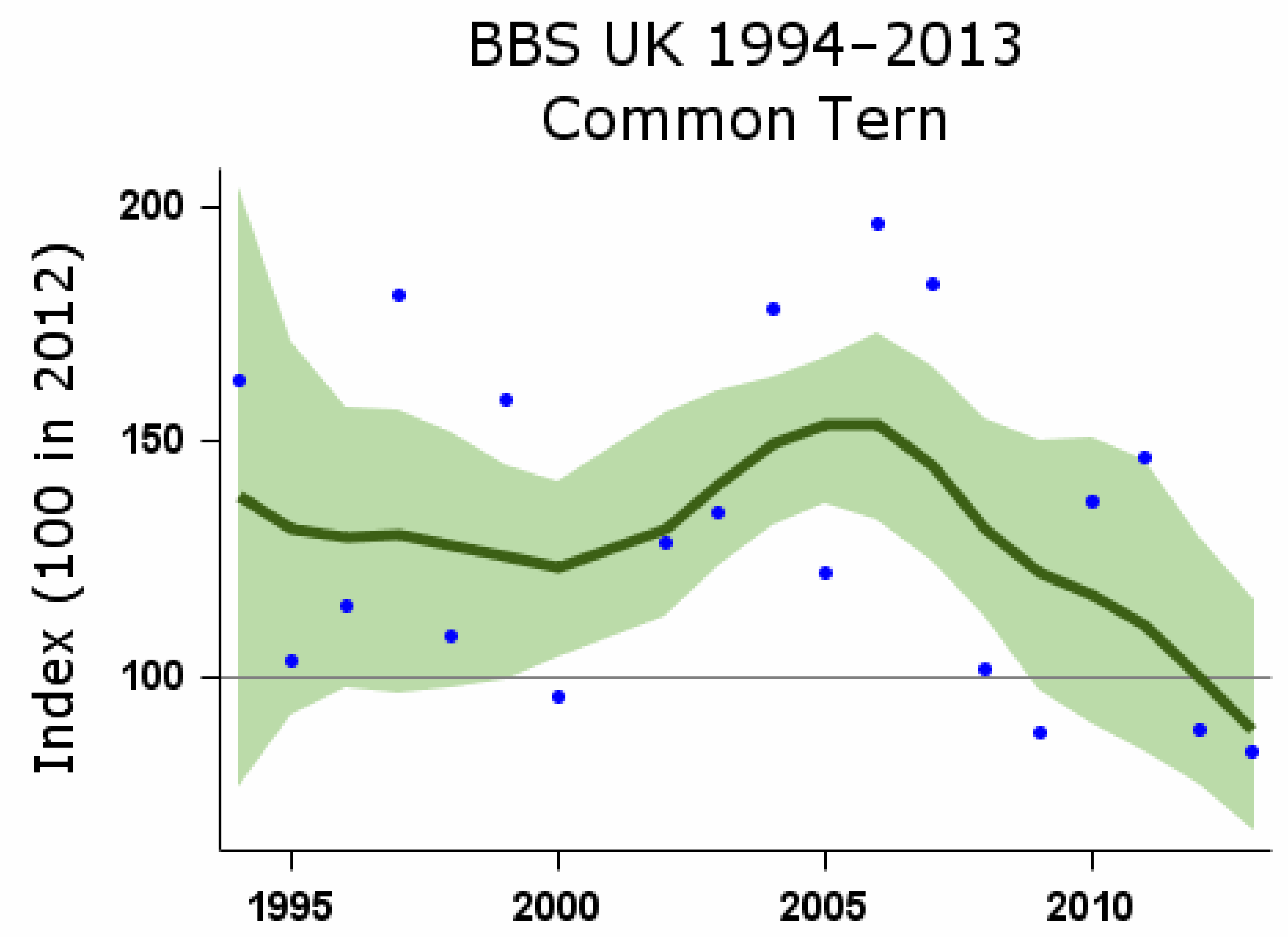
Key facts

Conservation listings:	Europe: no SPEC category (favourable conservation status in Europe, not concentrated in Europe) (BiE04) UK: amber (>50% of UK breeding population found at 10 or fewer sites) (BoCC3)
Long-term trend:	UK: possible decline
Population size:	12,000 pairs in 2000 (APEP13: Seabird 2000 (Mitchell et al. 2004)

Status summary

Common Terns breed at lakes and reservoirs scattered across lowland Britain, especially in the major river valleys, and extensively at the coast. There are a few very large coastal colonies and groups of colonies that account for more than half the total population. Breeding numbers and productivity at sample colonies have been monitored annually since 1986 by JNCC's Seabird Monitoring Programme. The abundance trend shows approximate stability to about 2006, followed by a slight downturn, while productivity appears to follow a similar pattern of stability and recent decline (SMP data here).

Common Terns are poorly covered by general breeding-bird surveys because of their highly aggregated breeding population. There have been enough birds seen on BBS visits for a trend to be drawn but this has an exceptionally wide confidence interval and probably relates mainly to birds seen on overland passage, prospecting for nest sites or breeding in small, dispersed colonies. Decrease in UK BBS squares over the last five years has been stronger than the downturn indicated by SMP and is sufficient to raise an alert.



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	17	1995-2012	68	-24	-55	44		Non-breeders included
	10	2002-2012	78	-24	-49	7		Non-breeders included

	5	2007-2012	86	-31	-49	-9	>25	Non-breeders included
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS England	17	1995-2012	62	25	-19	132		Non-breeders included
	10	2002-2012	73	-6	-31	37		Non-breeders included
	5	2007-2012	82	-14	-33	18		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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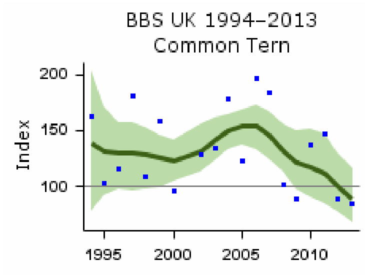
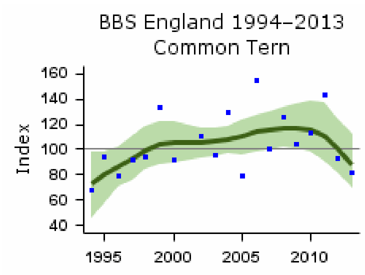


BBS UK graph



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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Feral Pigeon

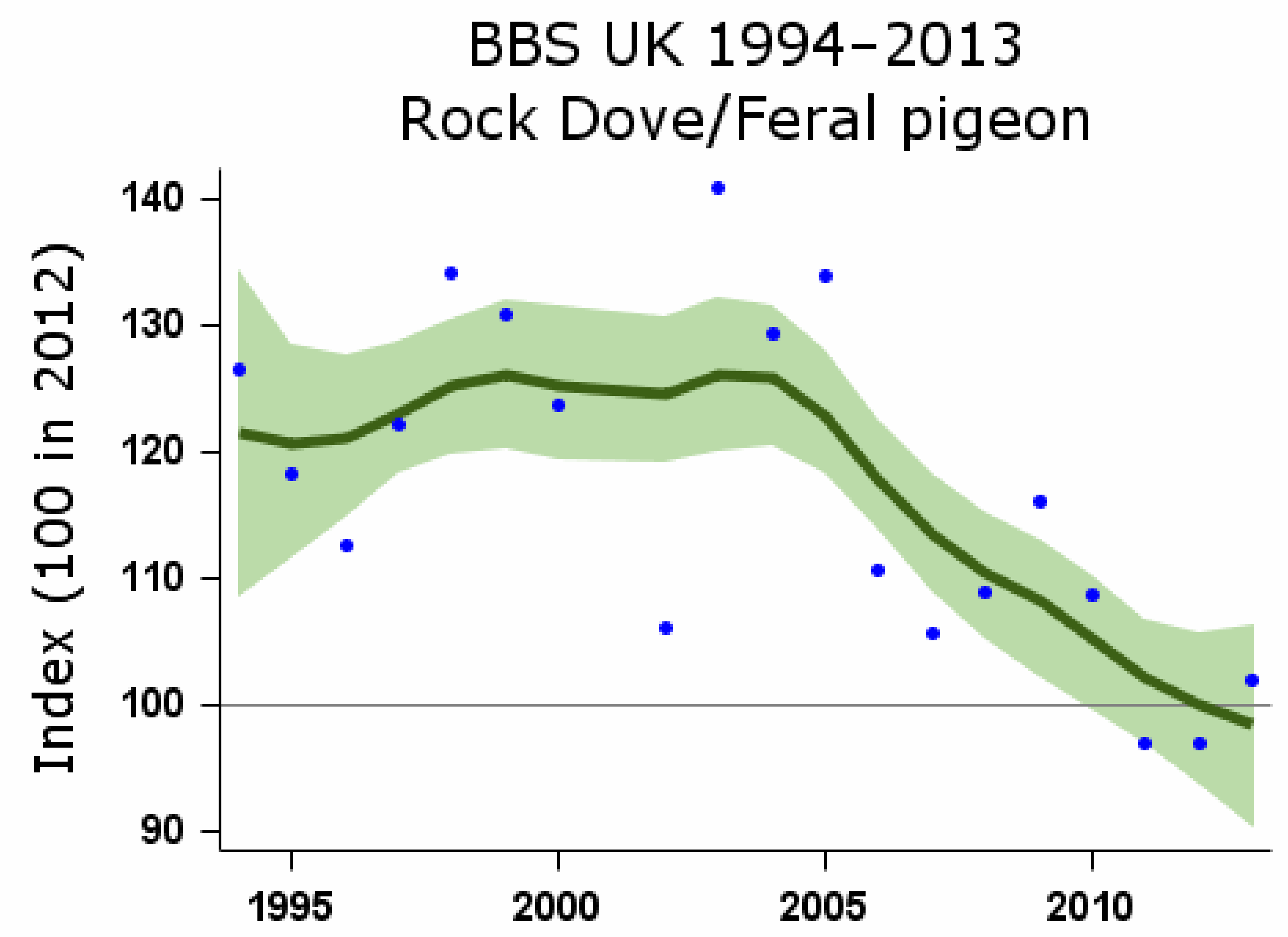
Columba livia f. domestica

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 have shown a 39% increase in occupied 10-km squares between 1968-72 and 1988-91 (Gibbons et al. 1993) and a further 5% or so by 2008-11 (Balmer et al. 2013), 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 there has been a substantial decline in numbers in England 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	17	1995-2012	691	-17	-27	-6		
	10	2002-2012	757	-20	-27	-12		

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	5	2007-2012	801	-12	-19	-5		
BBS England	17	1995-2012	571	-26	-35	-13	>25	
	10	2002-2012	620	-27	-36	-18	>25	
	5	2007-2012	667	-16	-24	-7		
BBS Scotland	17	1995-2012	65	8	-33	65		
	10	2002-2012	72	3	-17	30		
	5	2007-2012	84	3	-19	25		
BBS Wales	17	1995-2012	34	43	0	97		
	10	2002-2012	39	-3	-26	30		
	5	2007-2012	40	1	-18	27		

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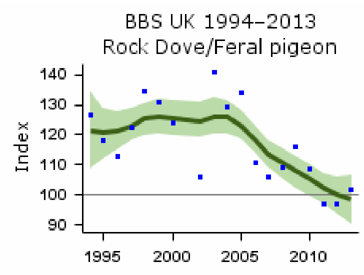
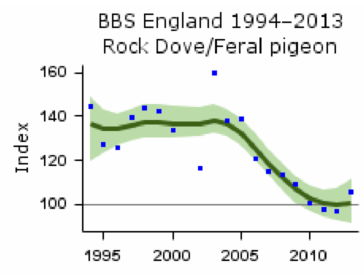
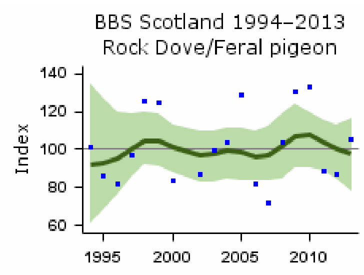


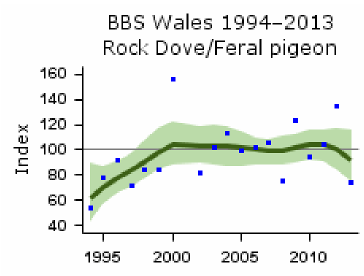
BBS UK graph



BBS England graph

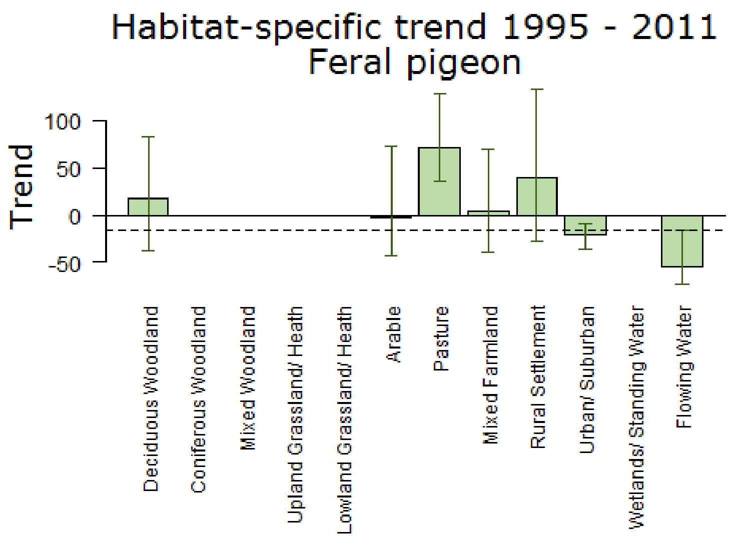


BBS Scotland graph



BBS Wales graph

Population trends by habitat



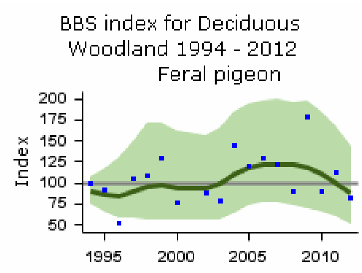
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

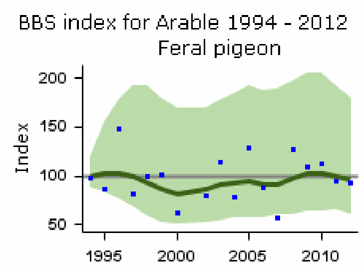
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	34	17	-37	84
Arable	16	1995-2011	55	-2	-42	72
Pasture	16	1995-2011	122	72	36	128
Mixed Farmland	16	1995-2011	57	5	-40	70
Rural Settlement	16	1995-2011	82	39	-27	133
Urban/ Suburban	16	1995-2011	175	-22	-36	-9
Flowing Water	16	1995-2011	48	-54	-72	-16

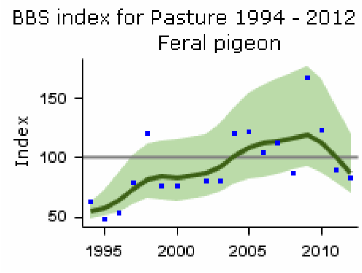
Further information on habitat-specific trends, please follow link here.



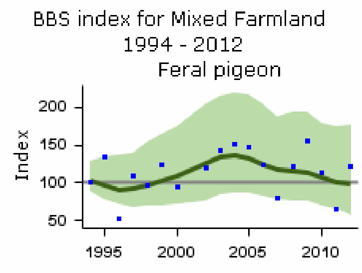
Habitat graph



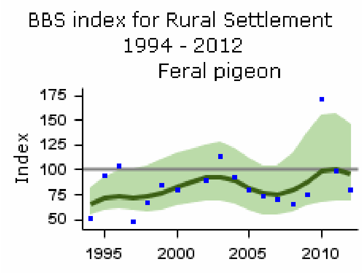
Habitat graph



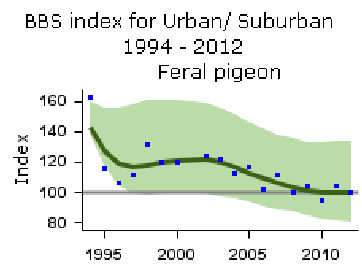
Habitat graph



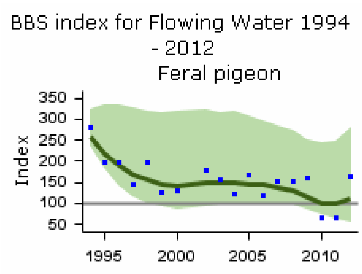
Habitat graph



Habitat graph



Habitat graph



Habitat 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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Stock Dove

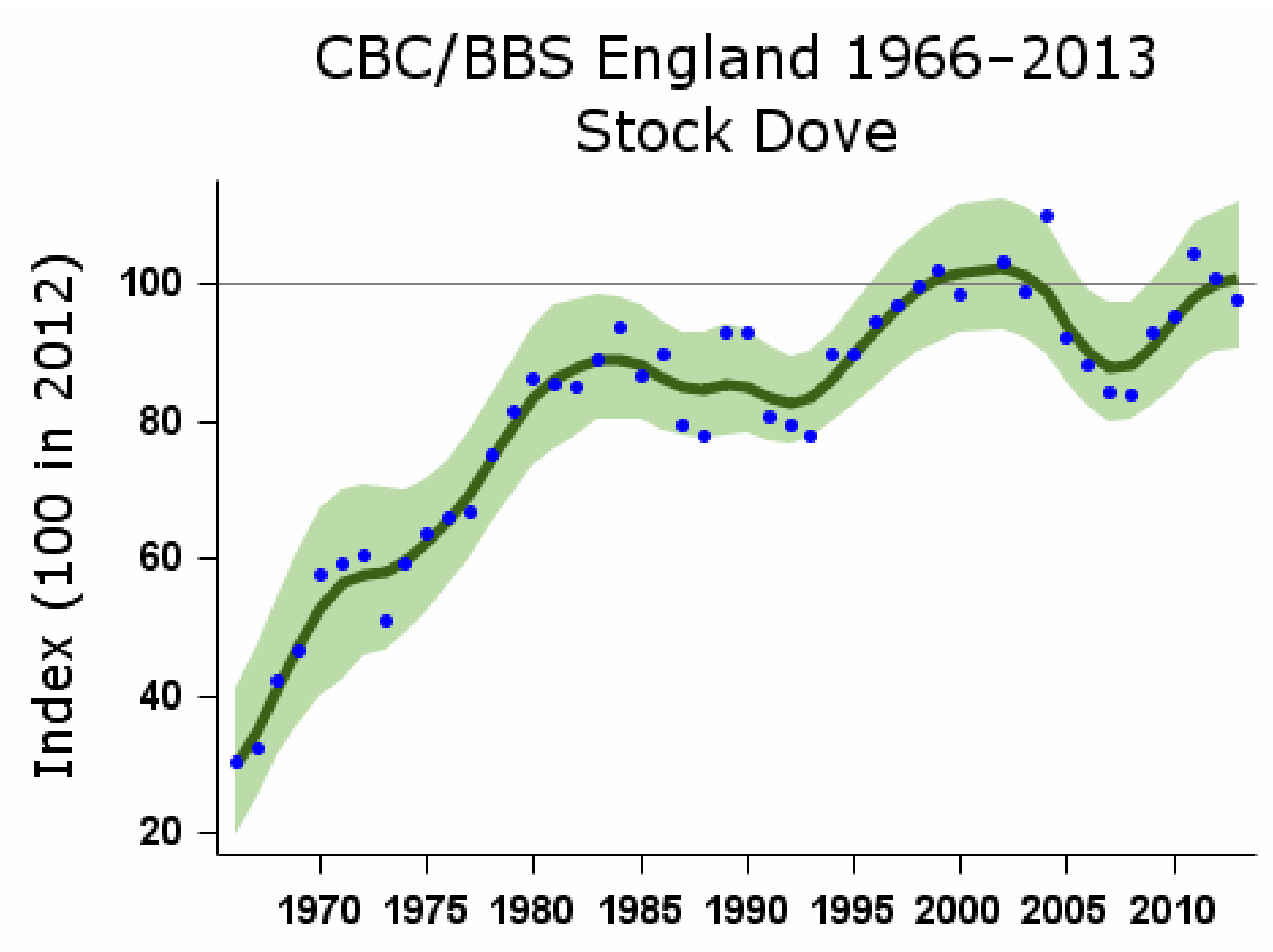
Columba oenas

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 itself 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 moderate increase across Europe since 1980, most of which has occurred since 2000 (PECBMS 2014a).



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

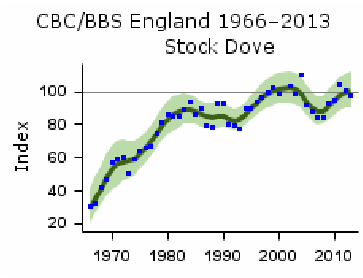
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	45	1967-2012	337	186	90	353		
	25	1987-2012	552	18	-1	40		
	10	2002-2012	819	-2	-9	5		
	5	2007-2012	912	14	8	20		

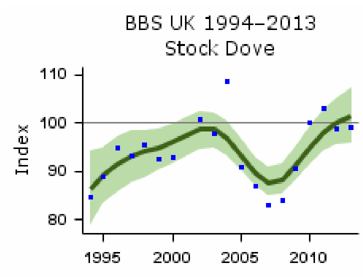
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	17	1995-2012	792	12	1	25		
	10	2002-2012	889	1	-7	10		
	5	2007-2012	989	14	8	20		
BBS England	17	1995-2012	730	8	-4	20		
	10	2002-2012	819	-2	-10	4		
	5	2007-2012	912	13	6	19		
BBS Wales	17	1995-2012	31	75	15	209		
	10	2002-2012	34	61	6	150		
	5	2007-2012	35	34	-2	89		

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

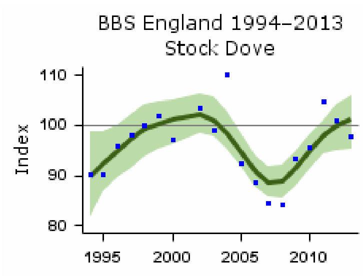
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



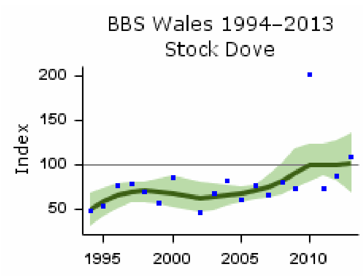
CBC/BBS England graph



BBS UK graph

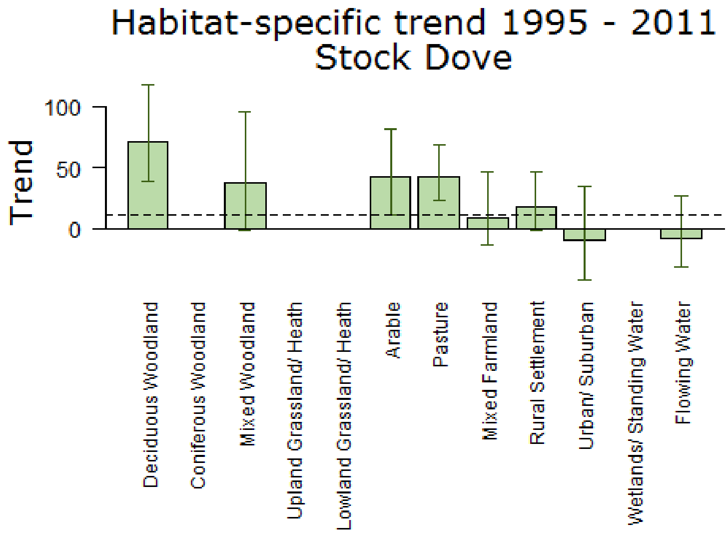


BBS England graph



BBS Wales graph

Population trends by habitat



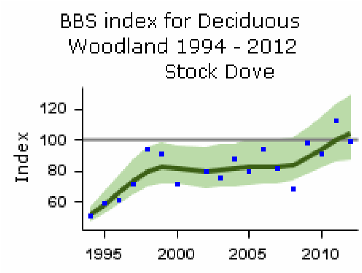
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

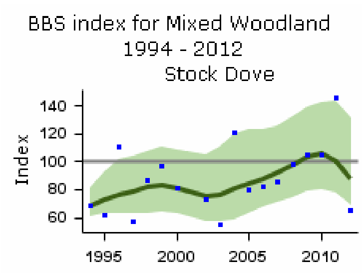
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	122	71	38	118
Mixed Woodland	16	1995-2011	53	38	-2	95
Arable	16	1995-2011	153	43	11	81
Pasture	16	1995-2011	220	42	23	69
Mixed Farmland	16	1995-2011	123	9	-14	47
Rural Settlement	16	1995-2011	124	18	-1	46
Urban/ Suburban	16	1995-2011	32	-9	-41	35
Flowing Water	16	1995-2011	60	-8	-31	27

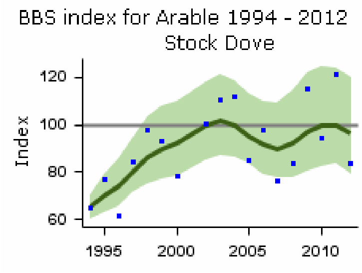
Further information on habitat-specific trends, please follow link here.



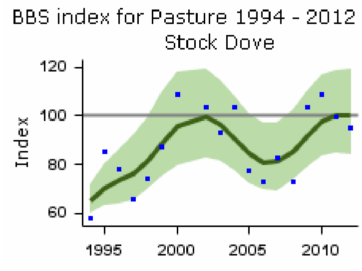
Habitat graph



Habitat graph



Habitat graph



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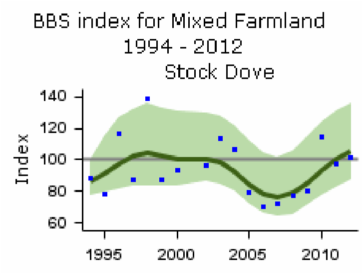

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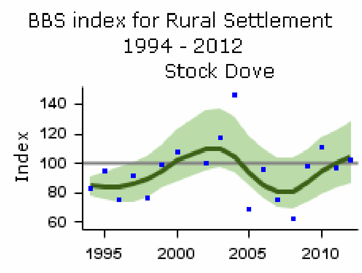
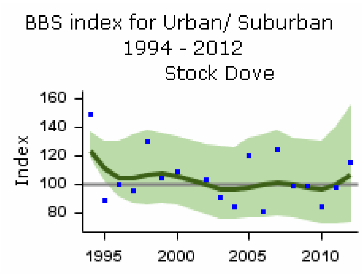
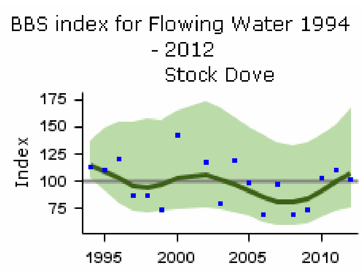


Habitat graph

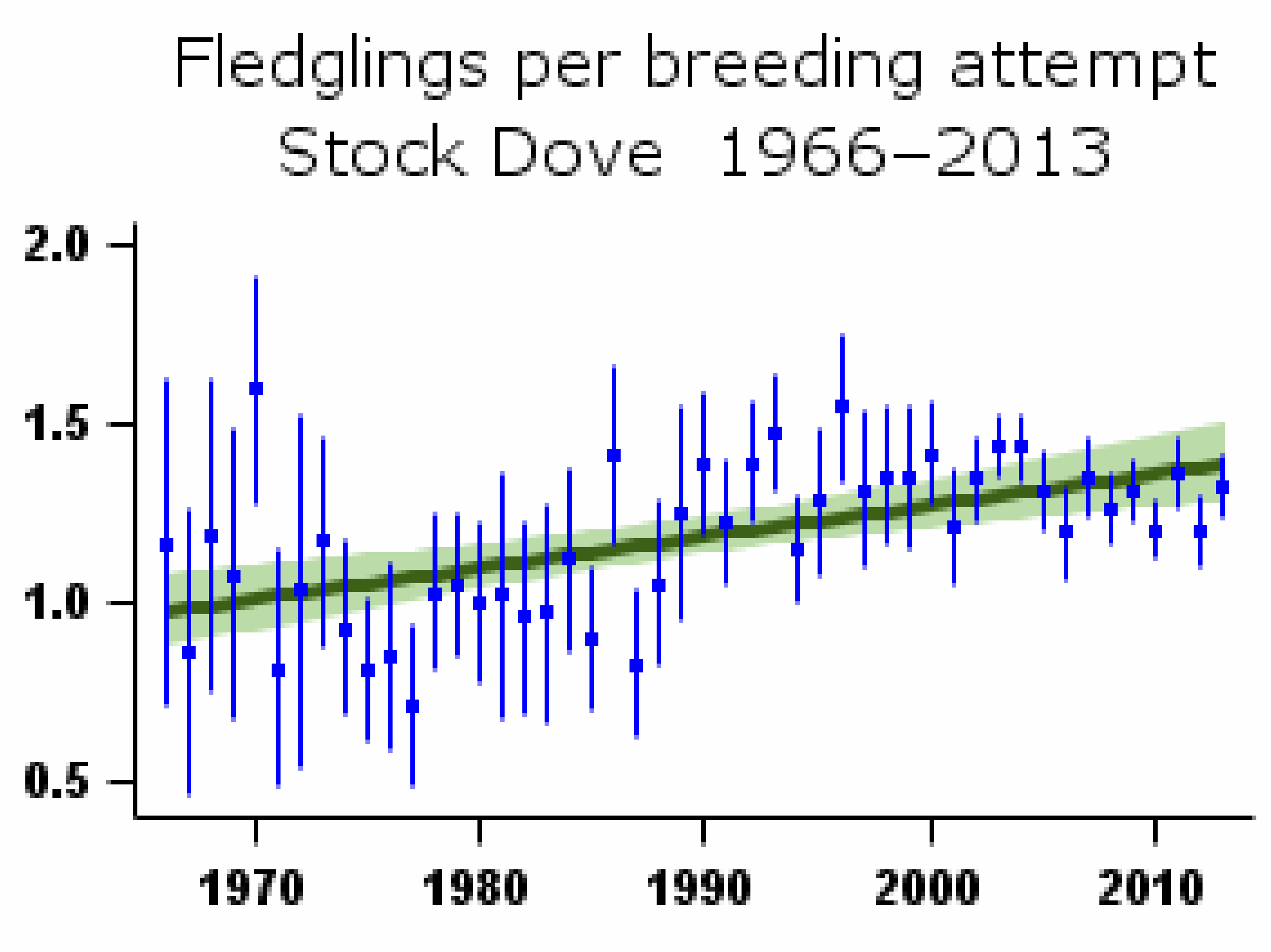


Habitat graph

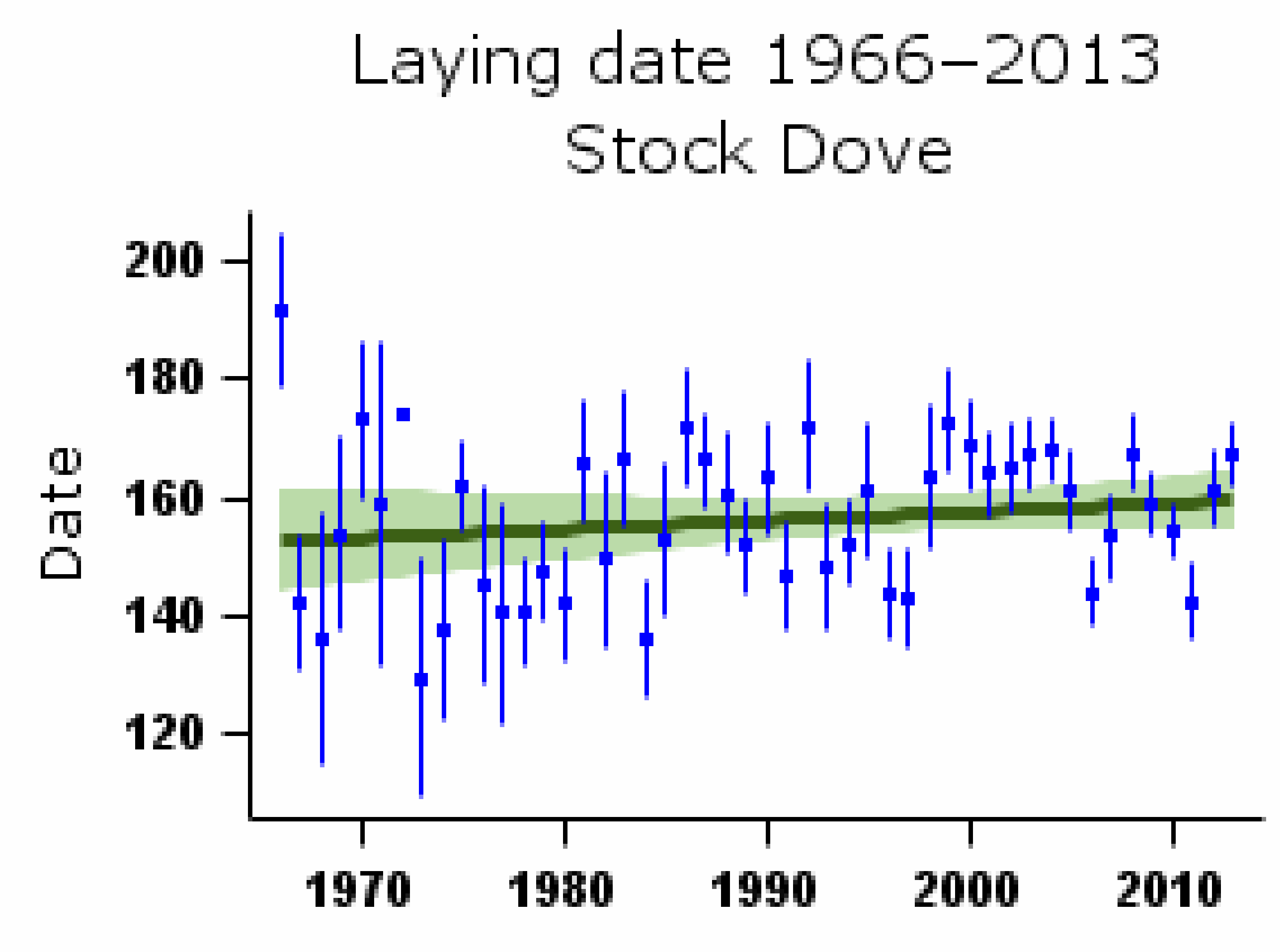


Habitat graph

Demographic trends



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

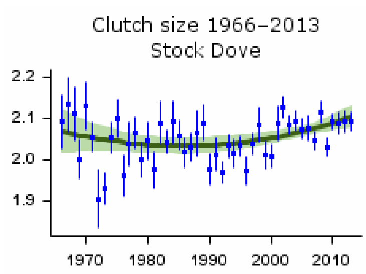


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

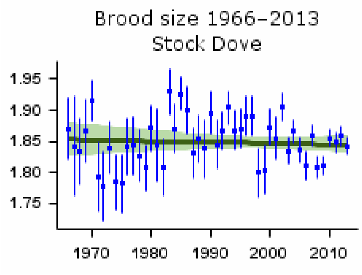
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	75	Linear increase	0.99 fledglings	1.38 fledglings	38.6%		
Clutch size	44	1968-2012	121	Curvilinear	2.06 eggs	2.10 eggs	1.7%		
Brood size	44	1968-2012	190	None					
Nest failure rate at egg stage	44	1968-2012	115	Curvilinear	1.80% nests/day	0.65% nests/day	-63.9%		
Nest failure rate at chick stage	44	1968-2012	75	Linear decline	1.13% nests/day	0.69% nests/day	-38.9%		
Laying date	44	1968-2012	25	None			0 days		Small sample

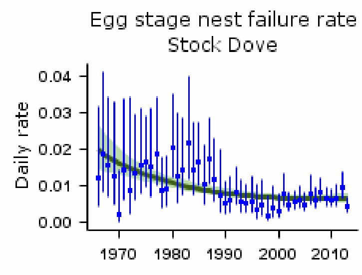
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



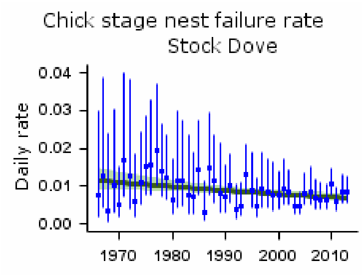
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



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 since the mid 1960s may be due to two phases: an initial recovery from the high mortality caused by organochlorines, followed by increased breeding performance.

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

Further information on causes of change

Stock Dove is a rare example of a farmland species in long-term increase. Its increase since the mid 1960s may fall into two phases: an initial recovery from the use of organochlorines, followed by an increase in breeding performance. It is not known why breeding should have become more productive. Overall, nest failure rates have fallen substantially since the 1980s and there has been a major increase in fledglings raised per breeding attempt.

A study based on nest record cards showed that egg-stage daily failure rate differed according to farm type between 1962-75 and 1976-95: breeding performance decreased on grazing farms and increased in arable farms, but did not differ in other farm types, suggesting that different environmental factors were acting across farm types (Siriwardena et al. 2000b).

Change from hunting quarry to protected status since 1982 has not affected the species' survival rates or population size (Aebischer 1995).

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Woodpigeon

Columba palumbus

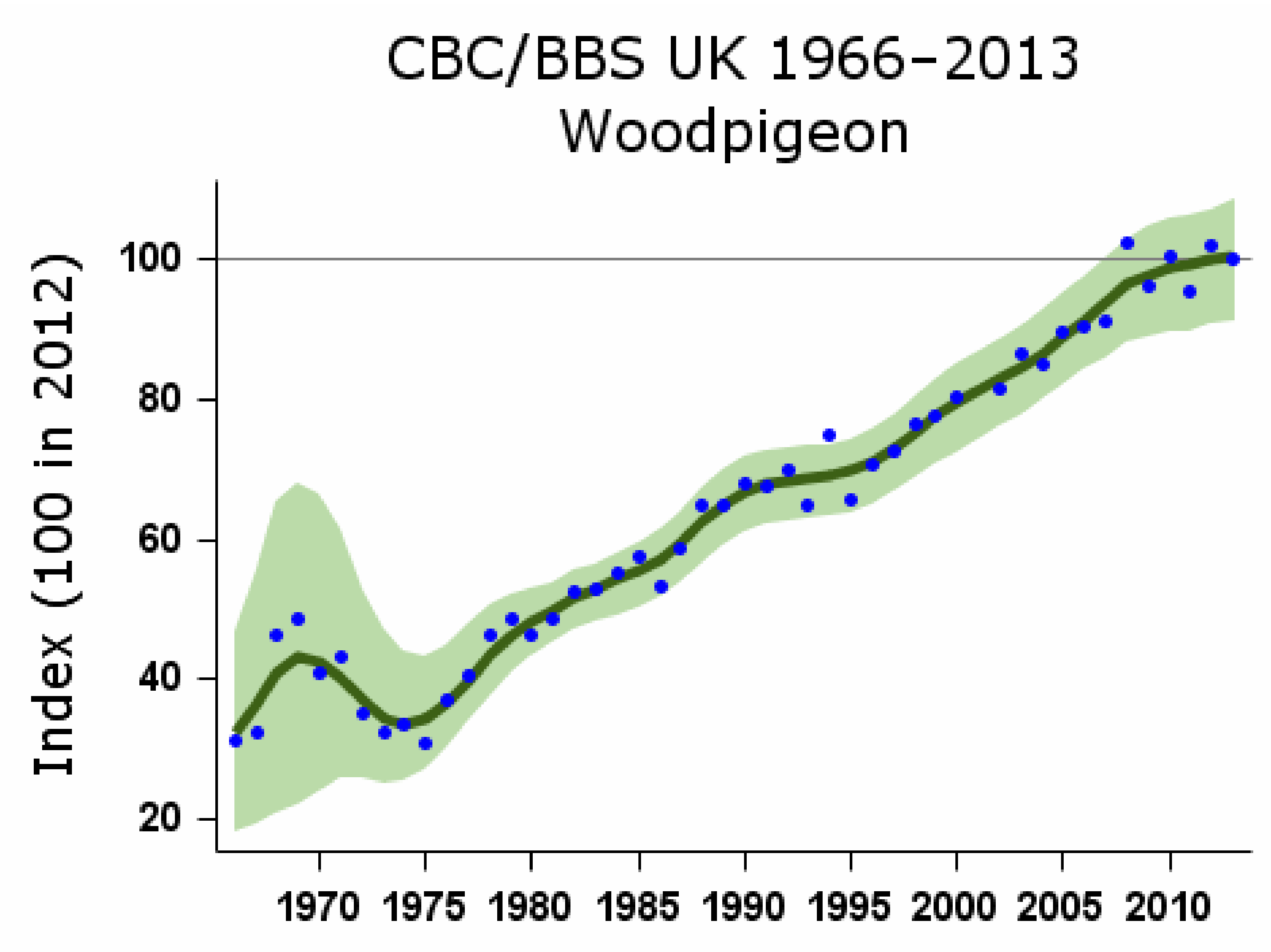
Key facts

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 2014a).



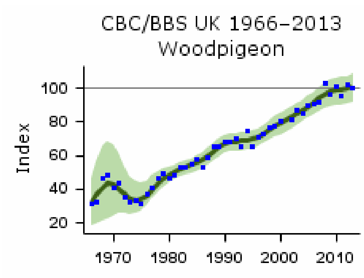
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

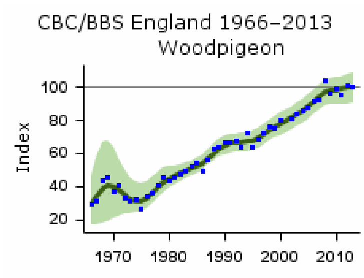
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	45	1967-2012	1054	173	51	519		
	25	1987-2012	1847	68	52	85		
	10	2002-2012	2839	20	16	25		
	5	2007-2012	3177	6	4	9		
CBC/BBS England	45	1967-2012	848	191	43	569		
	25	1987-2012	1485	75	56	95		
	10	2002-2012	2275	22	17	27		
	5	2007-2012	2565	5	2	9		
BBS UK	17	1995-2012	2516	42	36	49		
	10	2002-2012	2839	21	18	26		
	5	2007-2012	3177	7	4	10		
BBS England	17	1995-2012	2017	46	38	53		
	10	2002-2012	2275	22	17	27		
	5	2007-2012	2565	6	2	9		
BBS Scotland	17	1995-2012	212	11	-8	34		
	10	2002-2012	236	11	0	22		
	5	2007-2012	279	13	3	23		
BBS Wales	17	1995-2012	189	26	9	48		
	10	2002-2012	211	13	0	32		
	5	2007-2012	210	1	-11	14		
BBS N.Ireland	17	1995-2012	85	88	48	136		
	10	2002-2012	100	16	4	25		
	5	2007-2012	106	10	2	20		

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

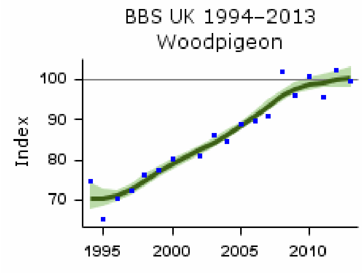
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



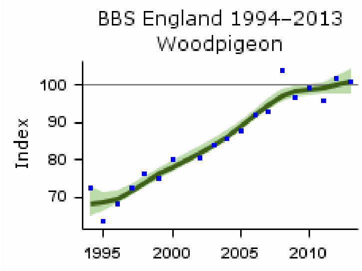
CBC/BBS UK graph



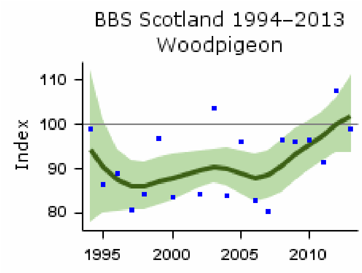
CBC/BBS England graph



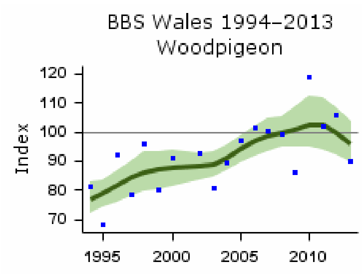
BBS UK graph



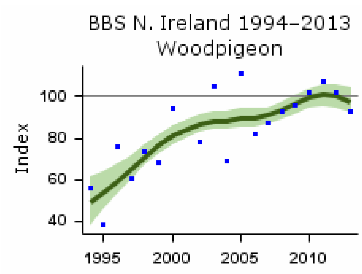
BBS England graph



BBS Scotland graph

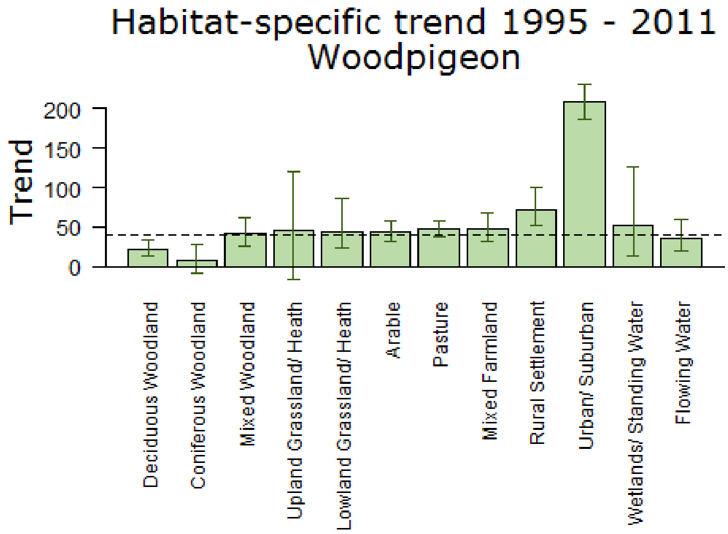


BBS Wales graph



BBS N.Ireland graph

Population trends by habitat



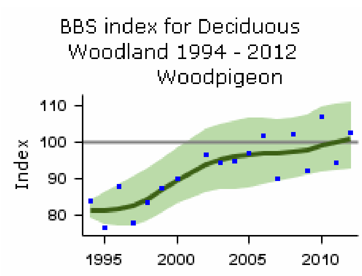
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

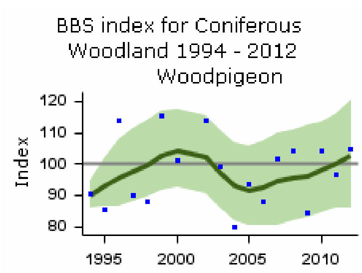
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	889	23	13	34
Coniferous Woodland	16	1995-2011	226	8	-8	29
Mixed Woodland	16	1995-2011	485	43	25	62
Upland Grassland/ Heath	16	1995-2011	32	46	-16	120
Lowland Grassland/ Heath	16	1995-2011	167	43	23	87
Arable	16	1995-2011	833	45	32	59
Pasture	16	1995-2011	1353	48	38	58
Mixed Farmland	16	1995-2011	764	49	32	69
Rural Settlement	16	1995-2011	866	73	51	100
Urban/ Suburban	16	1995-2011	432	210	188	231
Wetlands/ Standing Water	16	1995-2011	105	52	13	126
Flowing Water	16	1995-2011	527	36	19	61

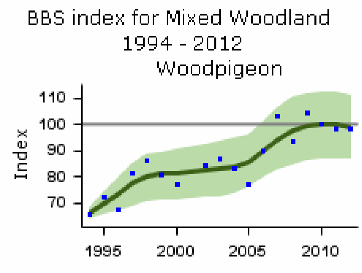
Further information on habitat-specific trends, please follow link here.



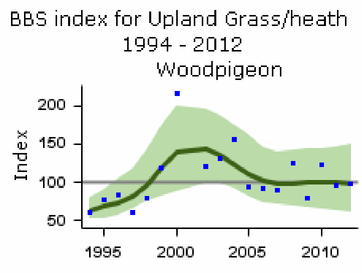
Habitat graph



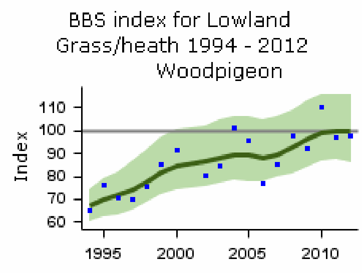
Habitat graph



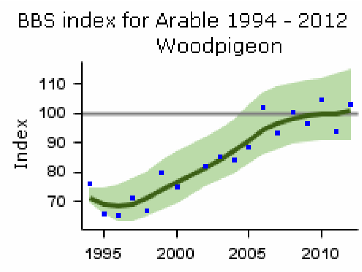
Habitat graph



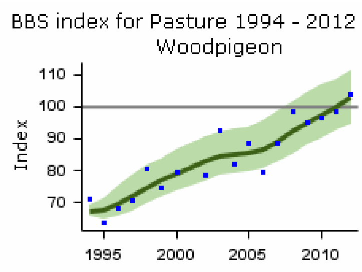
Habitat graph



Habitat graph



Habitat graph



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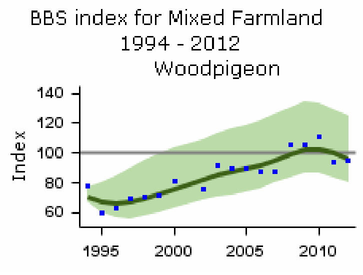

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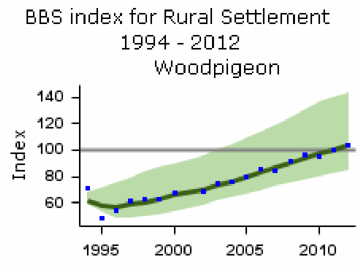

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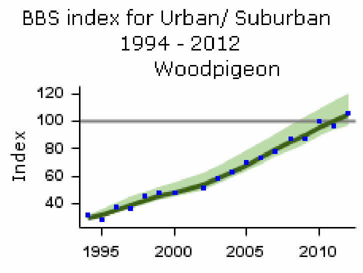

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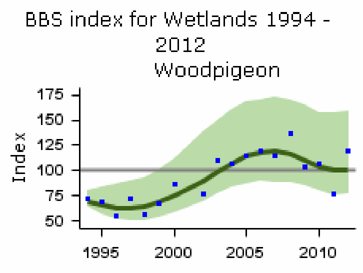

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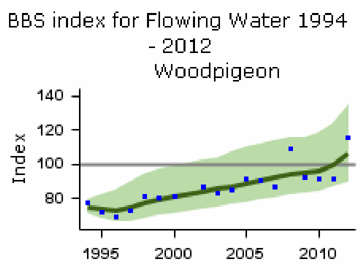
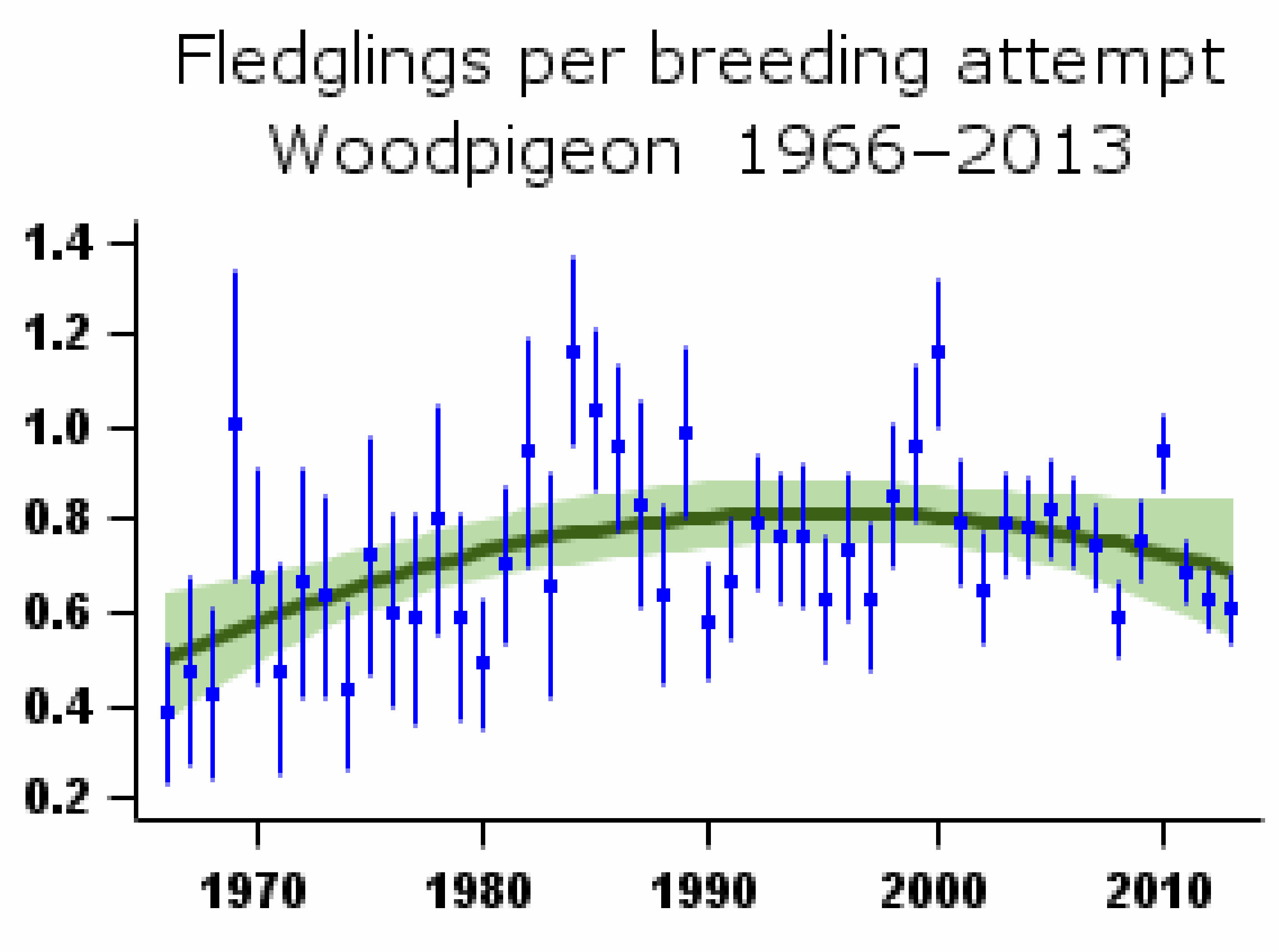
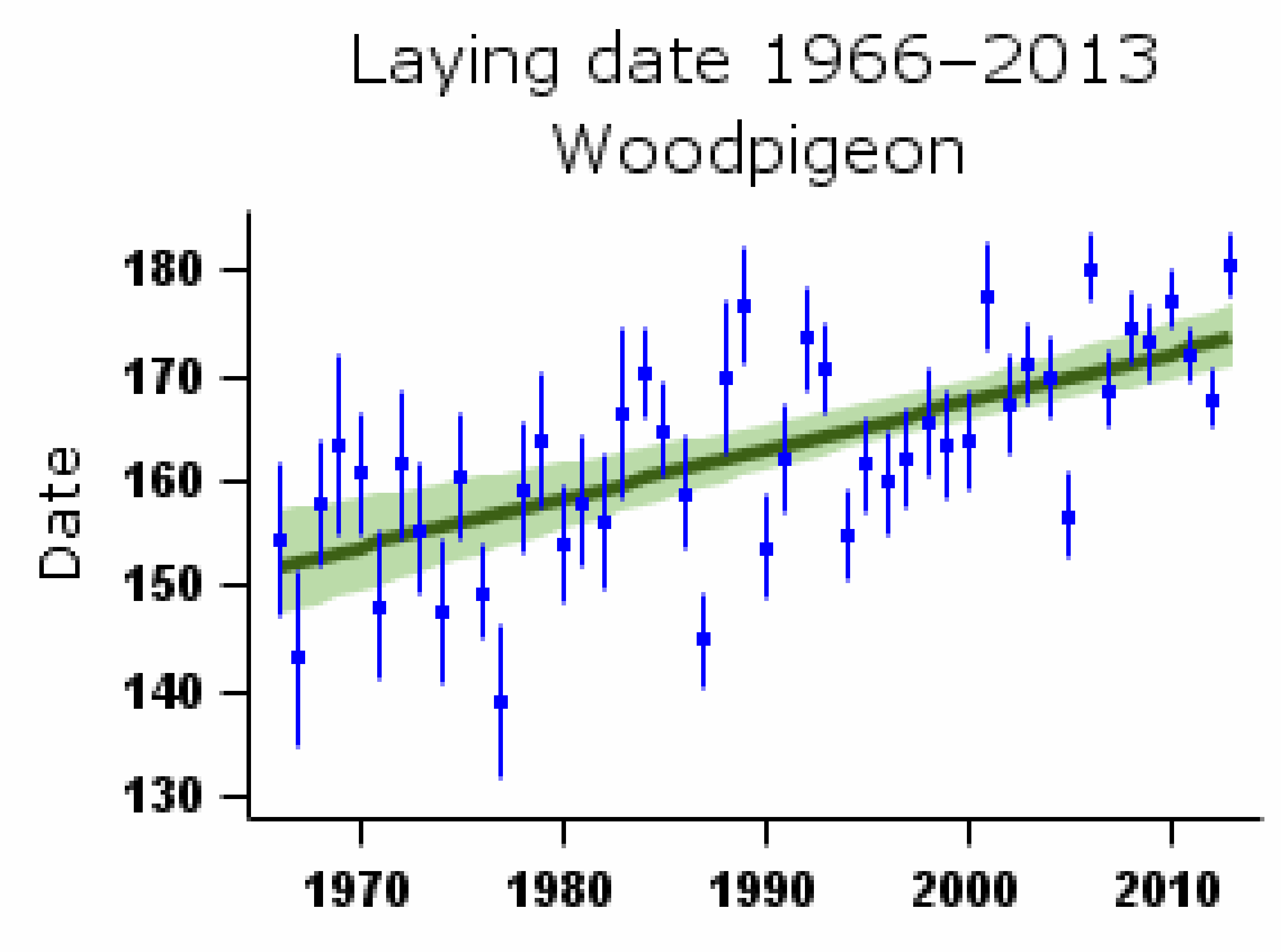


Habitat graph

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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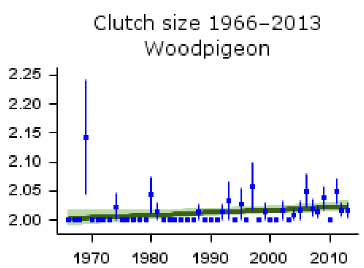
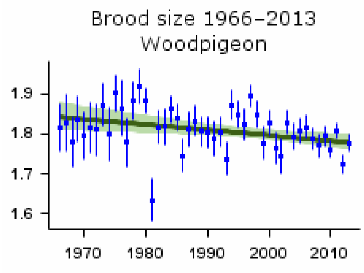
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	80	Curvilinear	0.54 fledglings	0.71 fledglings	30.3%		
Clutch size	44	1968-2012	76	None					
Brood size	44	1968-2012	124	Linear decline	1.84 chicks	1.78 chicks	-3.4%		
Nest failure rate at egg stage	44	1968-2012	100	Curvilinear	4.42% nests/day	2.84% nests/day	-35.7%		
Nest failure rate at chick stage	44	1968-2012	81	Curvilinear	2.00% nests/day	1.77% nests/day	-11.5%		
Laying date	44	1968-2012	91	Linear increase	Jun 2	Jun 22	20 days		

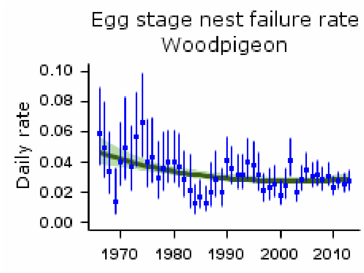
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



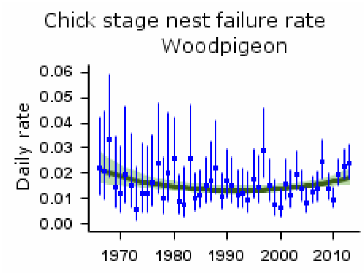
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Collared Dove

Streptopelia decaocto

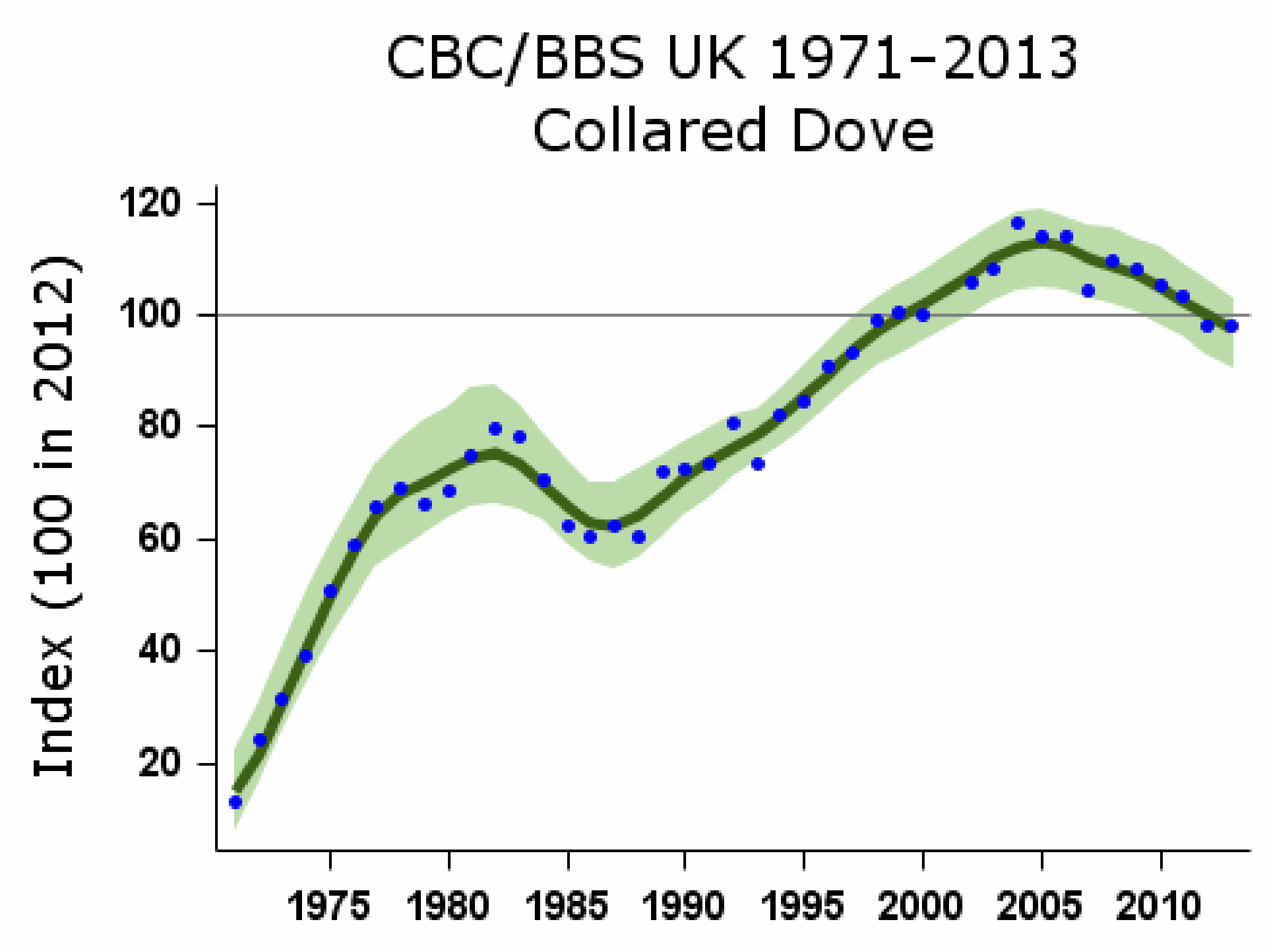
Key facts

Conservation listings:	Europe: no SPEC category (favourable conservation status in Europe, not concentrated in Europe) (BiE04) UK: green (BoCC3)
Long-term trend:	UK: 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 had levelled off by about 1980 only to rise again from the late 1990s onward. BBS shows continuing increases, at least in England and Wales, with a recent downturn nationally to pre-2000 population levels. The BBS PECBMS 2014a).



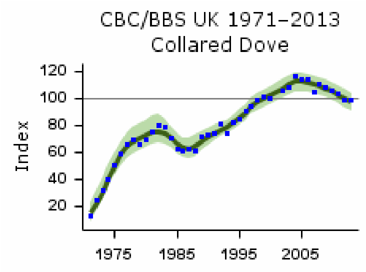
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

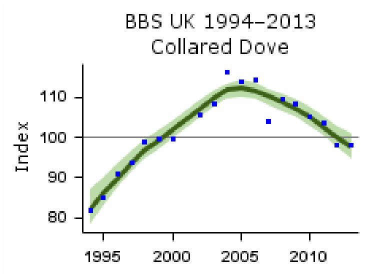
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	40	1972-2012	656	361	196	558		
	25	1987-2012	1003	60	32	92		
	10	2002-2012	1552	-7	-12	-2		
	5	2007-2012	1708	-9	-12	-6		
BBS UK	17	1995-2012	1370	16	9	24		
	10	2002-2012	1552	-7	-10	-2		
	5	2007-2012	1708	-9	-12	-6		
BBS England	17	1995-2012	1200	15	9	25		
	10	2002-2012	1348	-9	-13	-4		
	5	2007-2012	1483	-11	-14	-8		
BBS Scotland	17	1995-2012	53	0	-28	37		
	10	2002-2012	63	18	-11	51		
	5	2007-2012	74	-6	-20	10		
BBS Wales	17	1995-2012	74	4	-34	56		
	10	2002-2012	85	-11	-25	3		
	5	2007-2012	91	-14	-22	-4		
BBS N.Ireland	17	1995-2012	32	110	19	180		
	10	2002-2012	41	32	0	63		
	5	2007-2012	46	29	9	49		

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

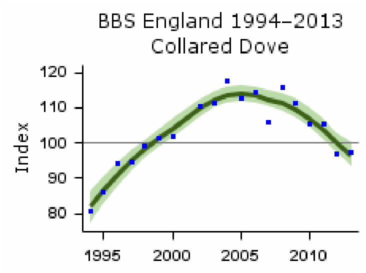
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



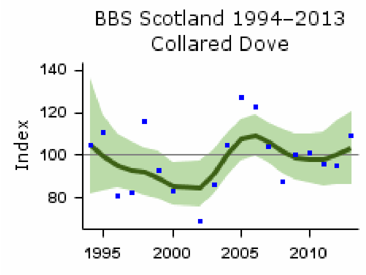
CBC/BBS UK graph



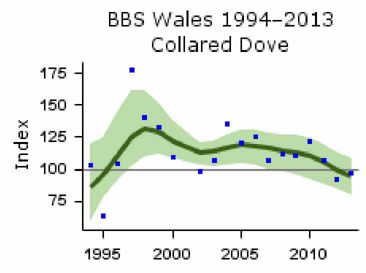
BBS UK graph



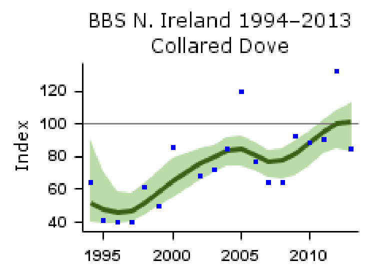
BBS England graph



BBS Scotland graph

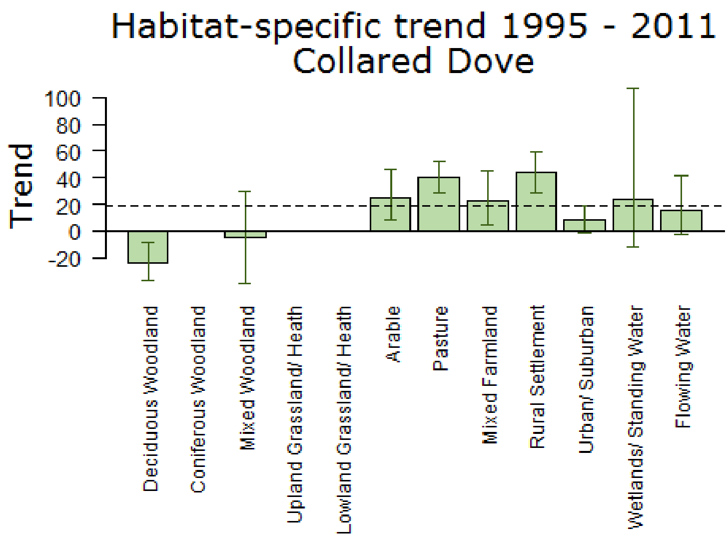


BBS Wales graph



BBS N.Ireland graph

Population trends by habitat



Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

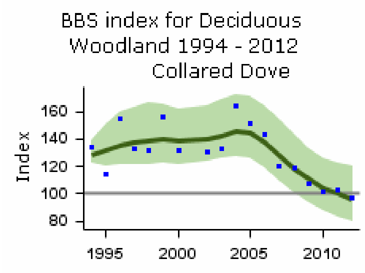
Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

More on habitat trends

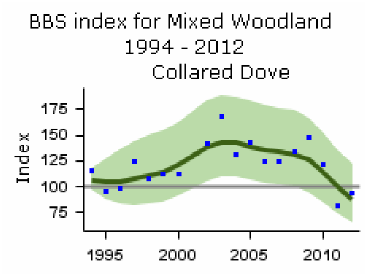
Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	183	-24	-37	-8

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Mixed Woodland	16	1995-2011	64	-5	-39	30
Arable	16	1995-2011	247	25	9	46
Pasture	16	1995-2011	510	40	29	53
Mixed Farmland	16	1995-2011	244	22	5	45
Rural Settlement	16	1995-2011	506	43	29	59
Urban/ Suburban	16	1995-2011	370	8	-1	19
Wetlands/ Standing Water	16	1995-2011	30	23	-13	107
Flowing Water	16	1995-2011	138	15	-2	41

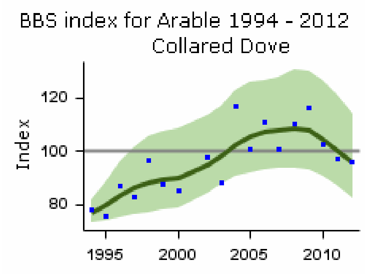
Further information on habitat-specific trends, please follow link here.



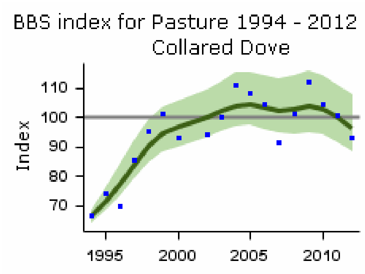
Habitat graph



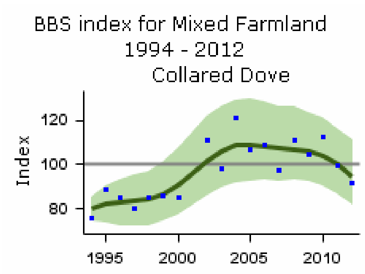
Habitat graph



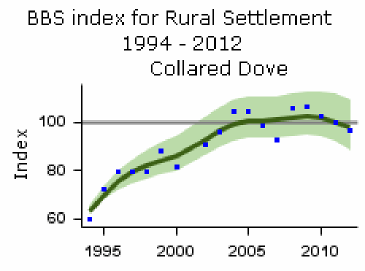
Habitat graph



Habitat graph



Habitat graph



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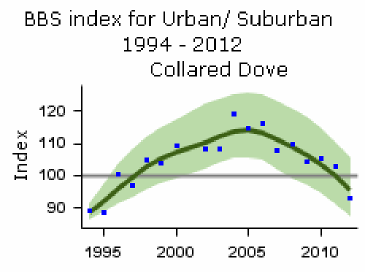

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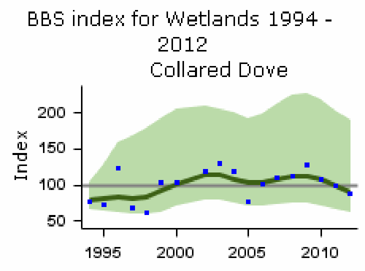
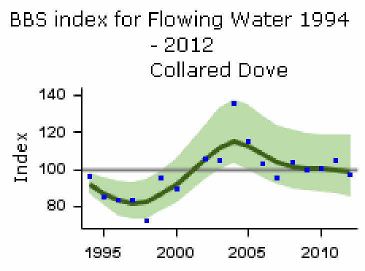
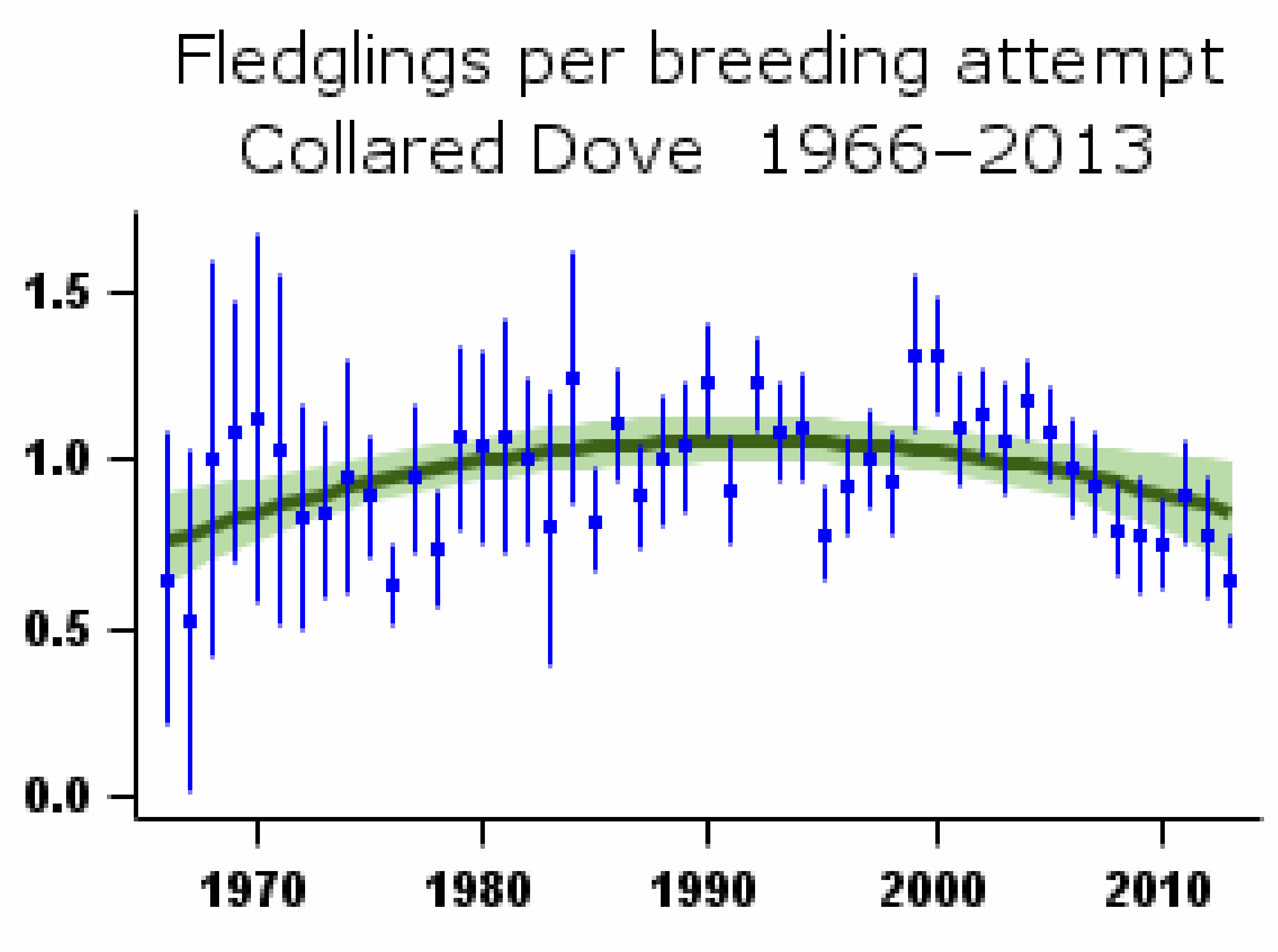


Habitat graph

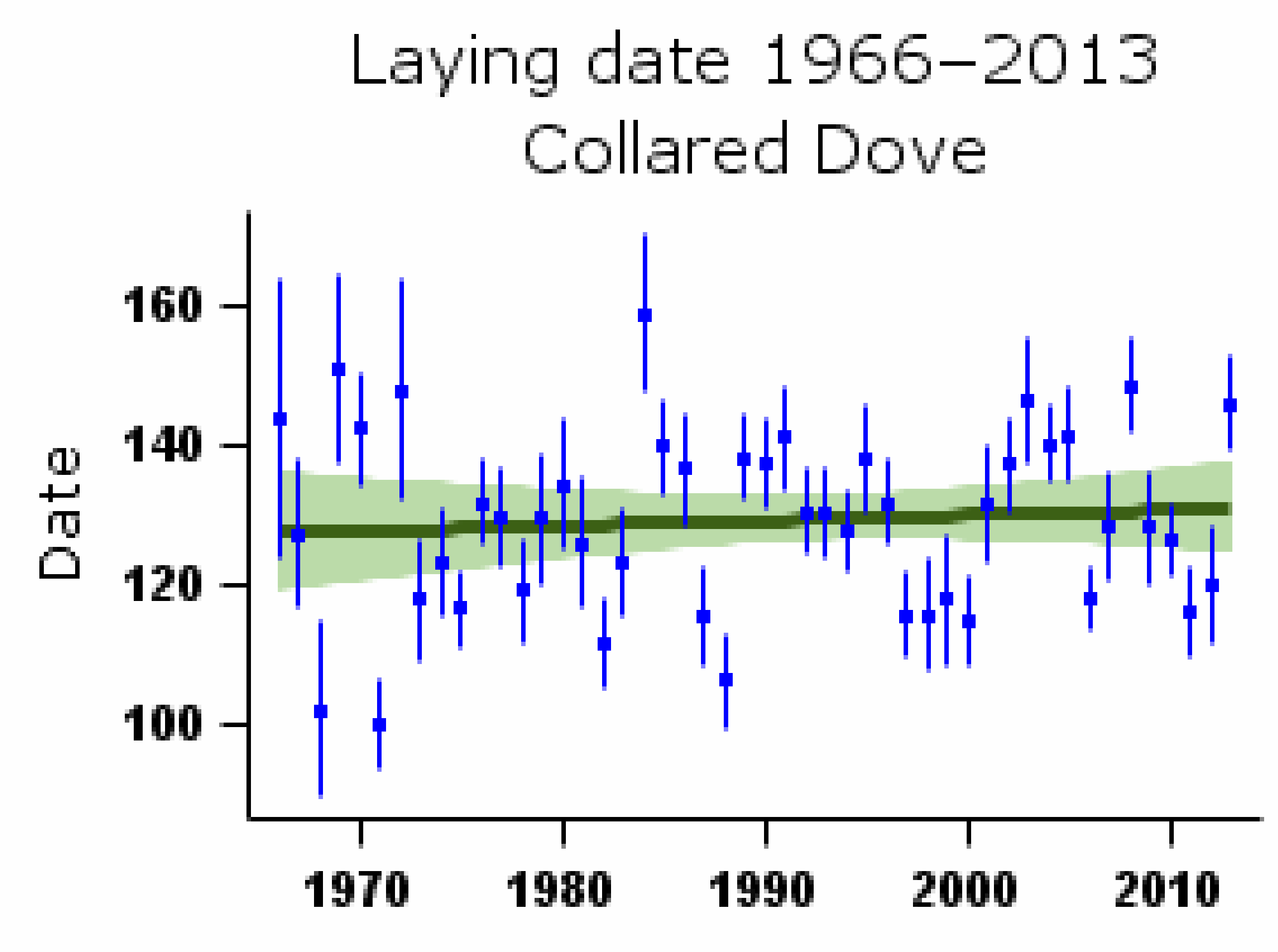


Habitat graph

Demographic trends



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

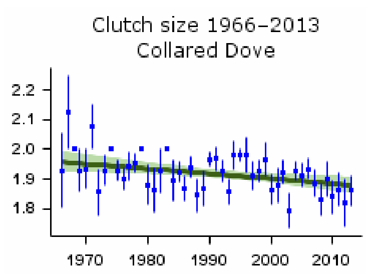


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

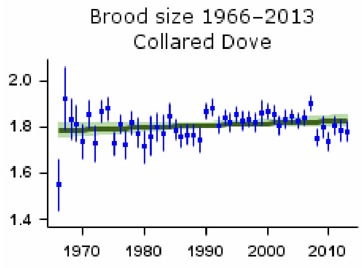
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	55	Curvilinear	0.81 fledglings	0.87 fledglings	7.5%		
Clutch size	44	1968-2012	44	Linear decline	1.95 eggs	1.88 eggs	-3.8%		
Brood size	44	1968-2012	74	None					
Nest failure rate at egg stage	44	1968-2012	62	Curvilinear	3.23% nests/day	3.05% nests/day	-5.6%		
Nest failure rate at chick stage	44	1968-2012	56	None					
Laying date	44	1968-2012	45	None			0 days		

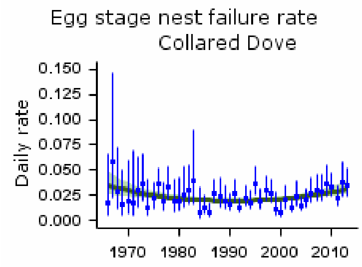
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



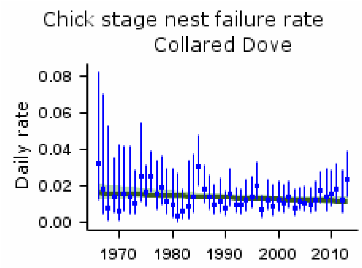
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



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 long-term 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 nesting productivity.

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 possible increase in brood size and a decline in daily failure rate at the egg 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 have been approaching the saturation of their niche. The outbreak of trichomonosis first noted in 2006 is thought to have affected this species quite severely and may be the primary cause of the current downturn. Population trends have been different 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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds.

Turtle Dove

Streptopelia turtur

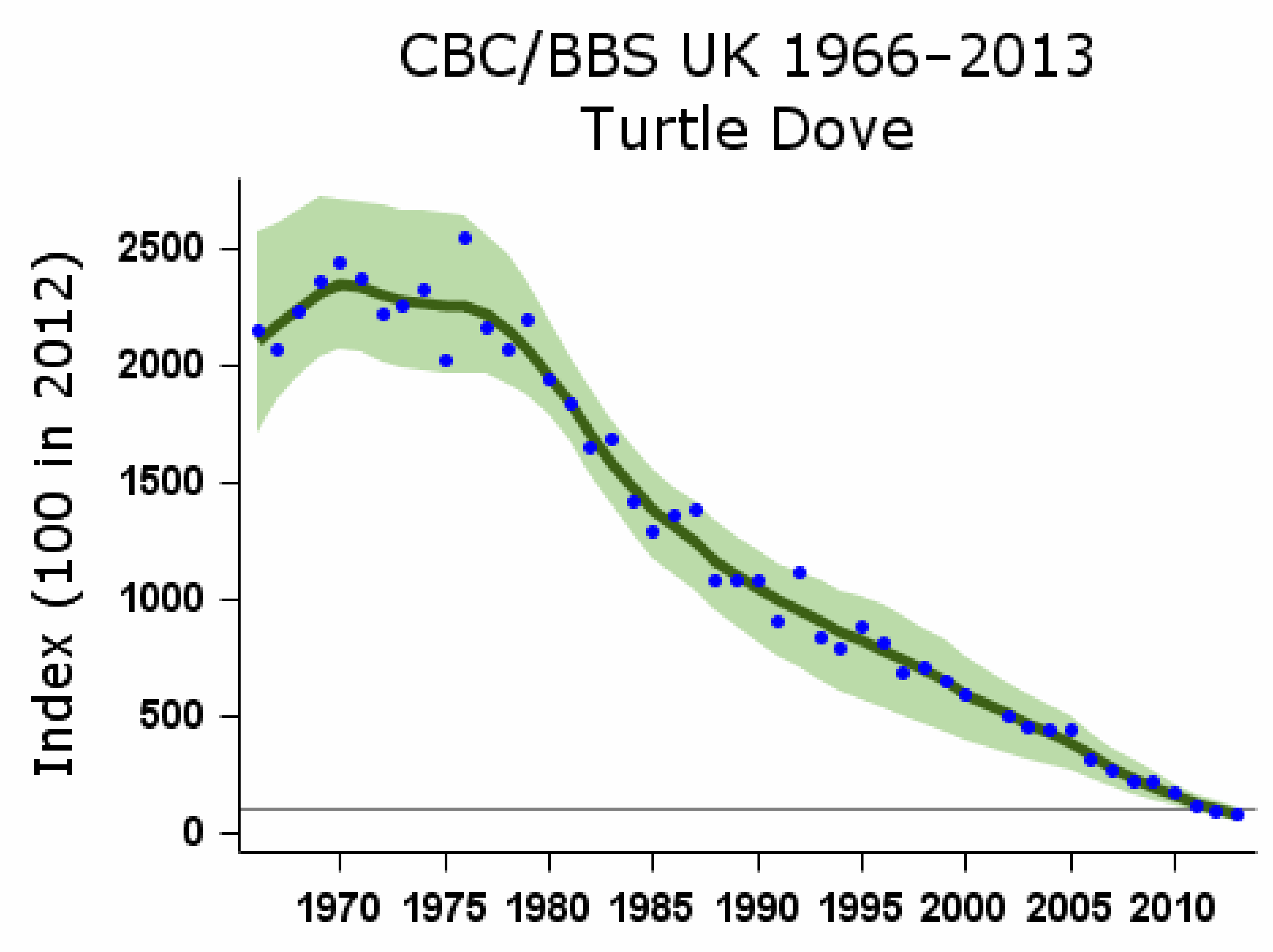
Key facts

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:	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 steeply to the present. Atlas data show that more than half the 10-km squares occupied in 1968-72 had been lost by 2008-11, with the population withdrawing towards East Anglia and Kent (Balmer et al. 2013). These trends, unless halted or reversed, would bring the species close to extinction in the UK within the next two decades. Turtle Dove has been one of the most strongly declining bird species across Europe since 1980, though the rate of fall has decreased since 1990 and the decline overall is classed as 'moderate' (PECBMS 2014a).



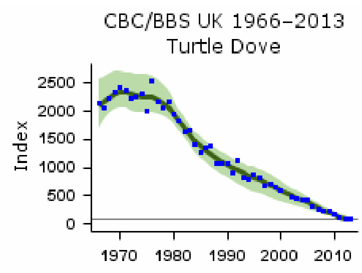
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

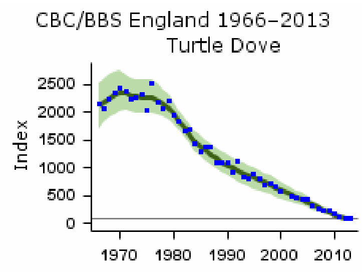
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	45	1967-2012	105	-95	-97	-93	>50	
	25	1987-2012	132	-92	-95	-89	>50	
	10	2002-2012	126	-80	-84	-75	>50	
	5	2007-2012	99	-65	-71	-59	>50	
CBC/BBS England	45	1967-2012	104	-95	-97	-93	>50	
	25	1987-2012	130	-92	-95	-90	>50	
	10	2002-2012	124	-80	-84	-76	>50	
	5	2007-2012	97	-65	-71	-60	>50	
BBS UK	17	1995-2012	153	-88	-90	-85	>50	
	10	2002-2012	126	-80	-85	-76	>50	
	5	2007-2012	99	-65	-72	-60	>50	
BBS England	17	1995-2012	150	-88	-90	-85	>50	
	10	2002-2012	124	-80	-84	-76	>50	
	5	2007-2012	97	-65	-71	-60	>50	

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

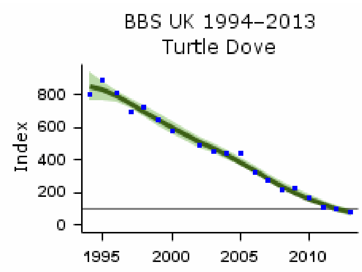
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



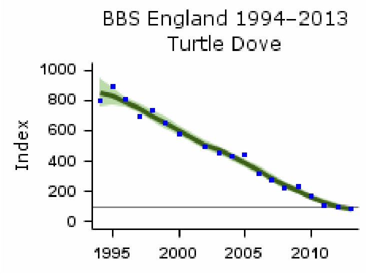
CBC/BBS UK graph



CBC/BBS England graph

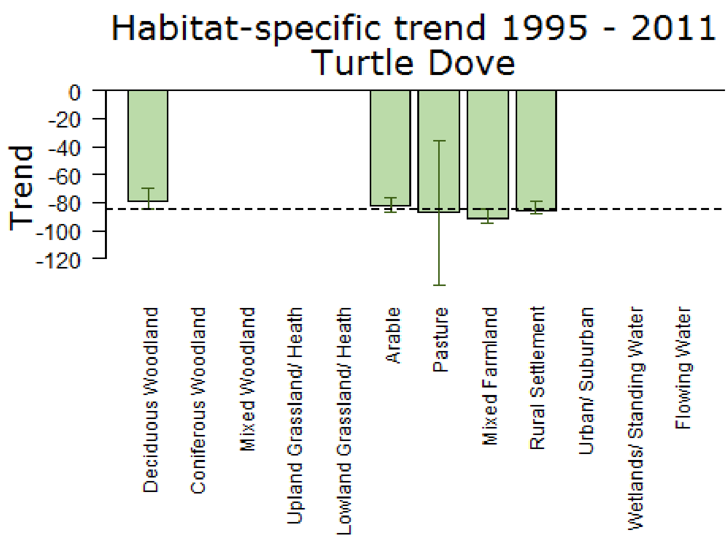


BBS UK graph



BBS England graph

Population trends by habitat



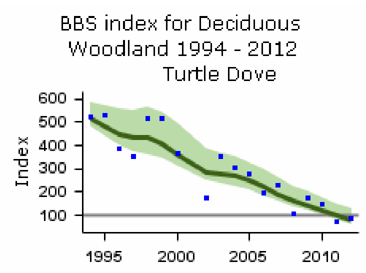
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

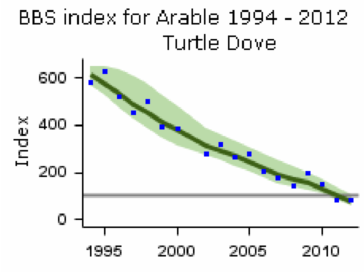
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	31	-79	-84	-70
Arable	16	1995-2011	59	-83	-86	-77
Pasture	16	1995-2011	36	-87	-138	-36
Mixed Farmland	16	1995-2011	33	-91	-94	-84
Rural Settlement	16	1995-2011	38	-85	-88	-78

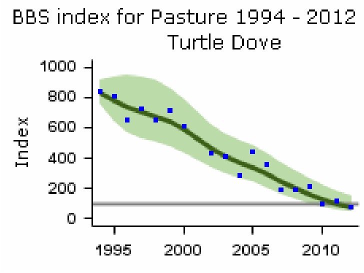
Further information on habitat-specific trends, please follow link here.



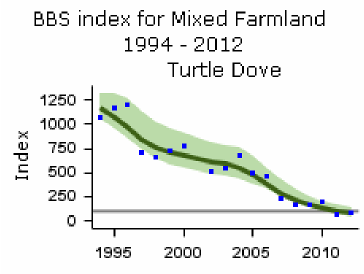
Habitat graph



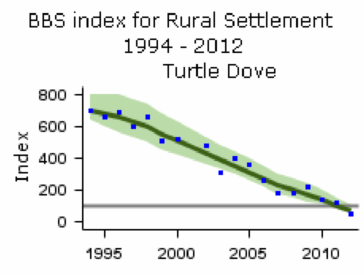
Habitat graph



Habitat graph

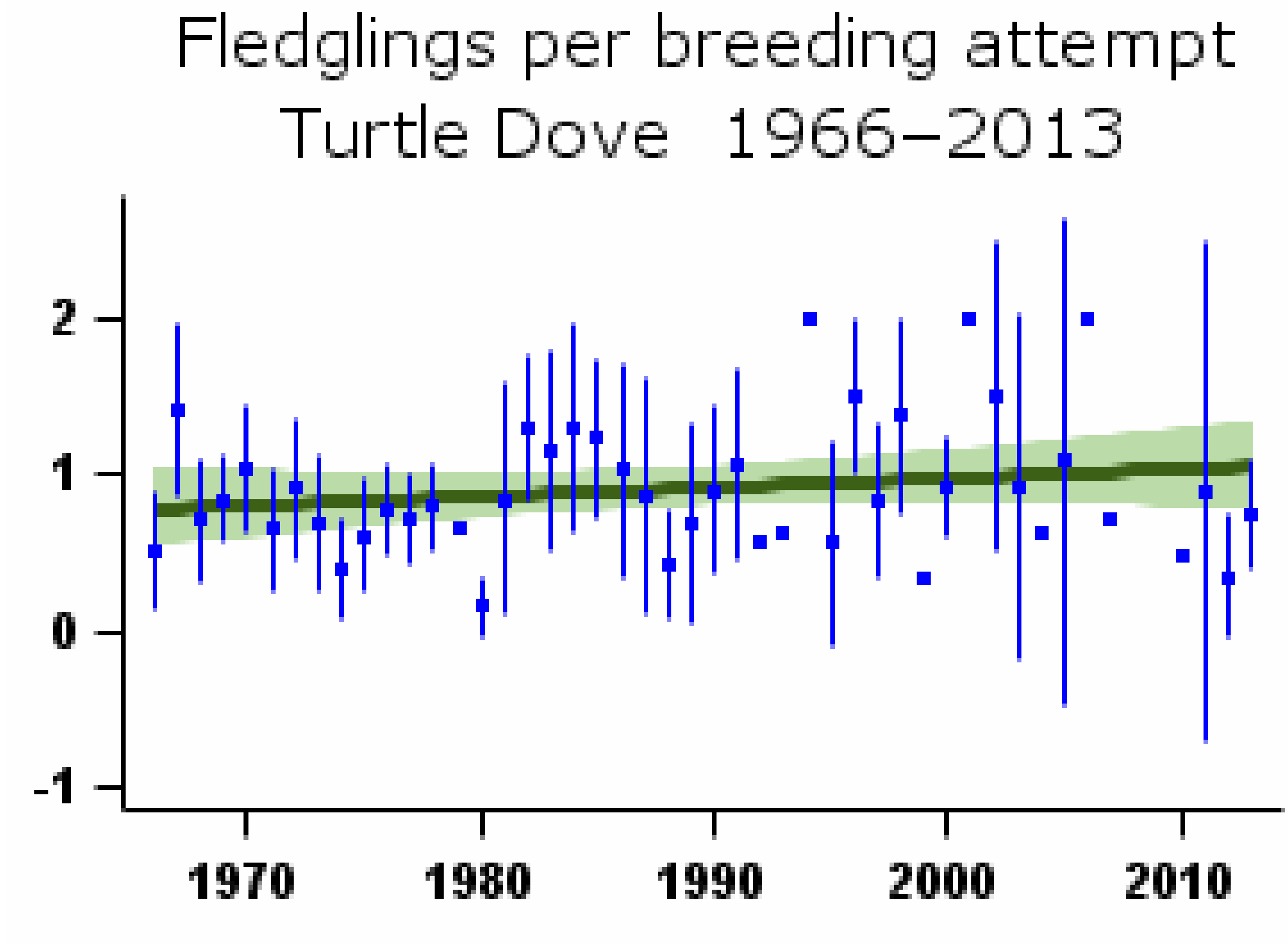


Habitat graph

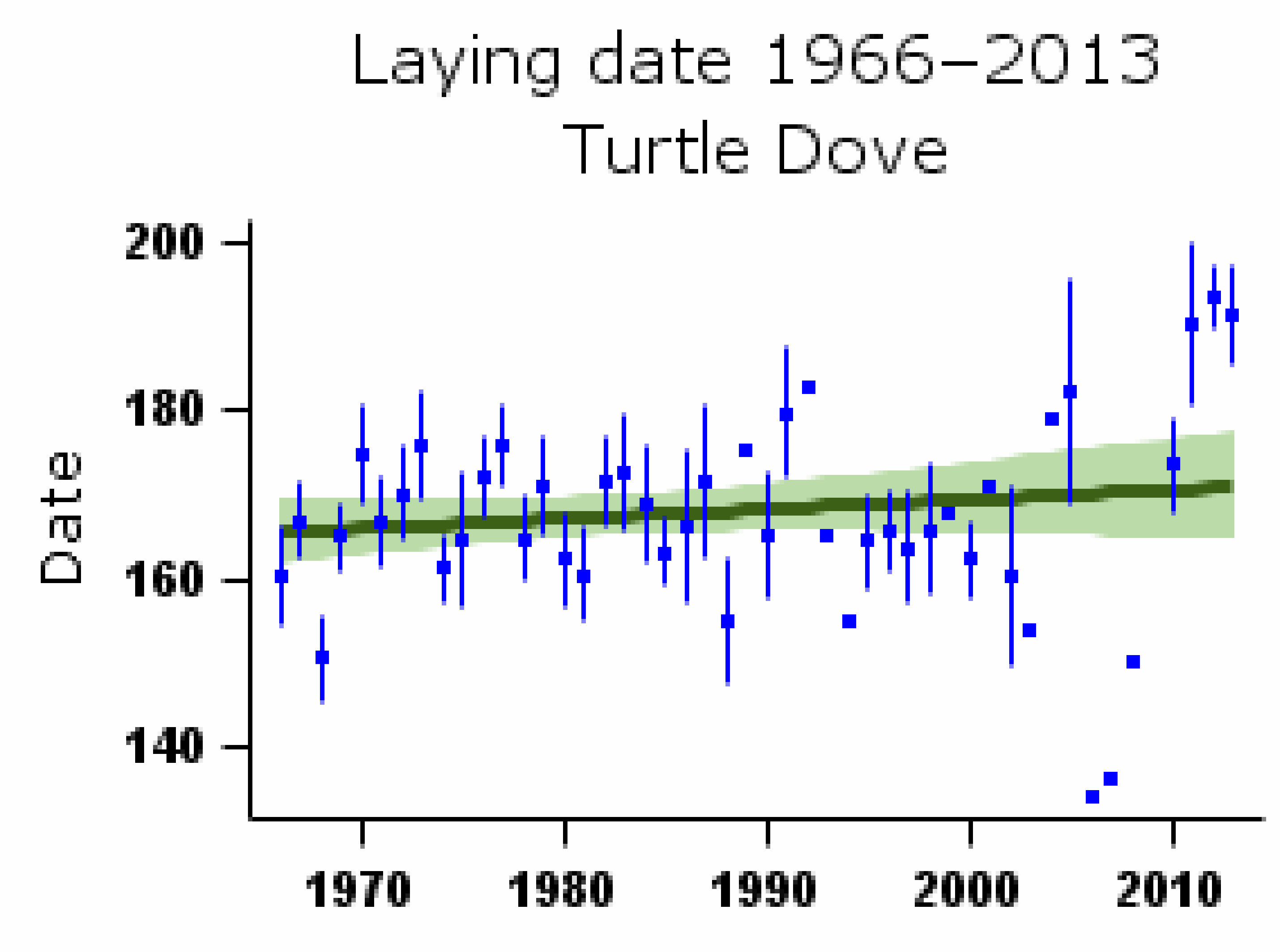


Habitat graph

Demographic trends



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

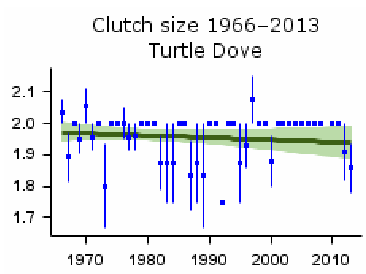


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

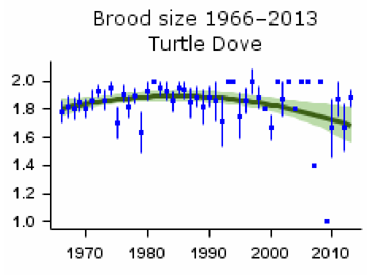
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	11	None					
Clutch size	44	1968-2012	12	None					Small sample
Brood size	44	1968-2012	15	Curvilinear	1.82 chicks	1.70 chicks	-6.7%		Small sample
Nest failure rate at egg stage	44	1968-2012	15	None					Small sample
Nest failure rate at chick stage	44	1968-2012	11	None					Small sample
Laying date	44	1968-2012	12	None			0 days		Small sample

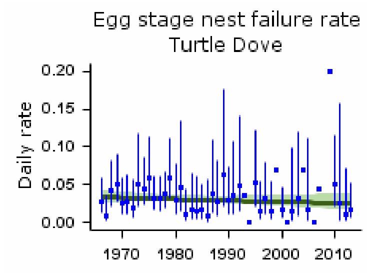
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



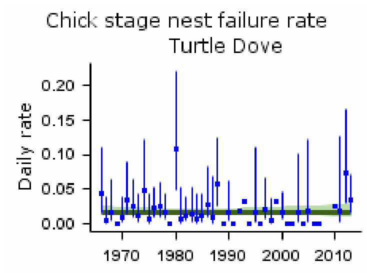
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



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 analyses that 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 Vickery et al. (2014) estimate that 2-4 million Turtle Doves are shot annually in southern Europe. 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. Trichomonosis, a disease widespread since 2005 that reduces fitness and survival among pigeons and other birds, has been recently observed in Turtle Doves and might therefore be a new factor in its decline (Stockdale et al. 2014).

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

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Cuckoo

Cuculus canorus

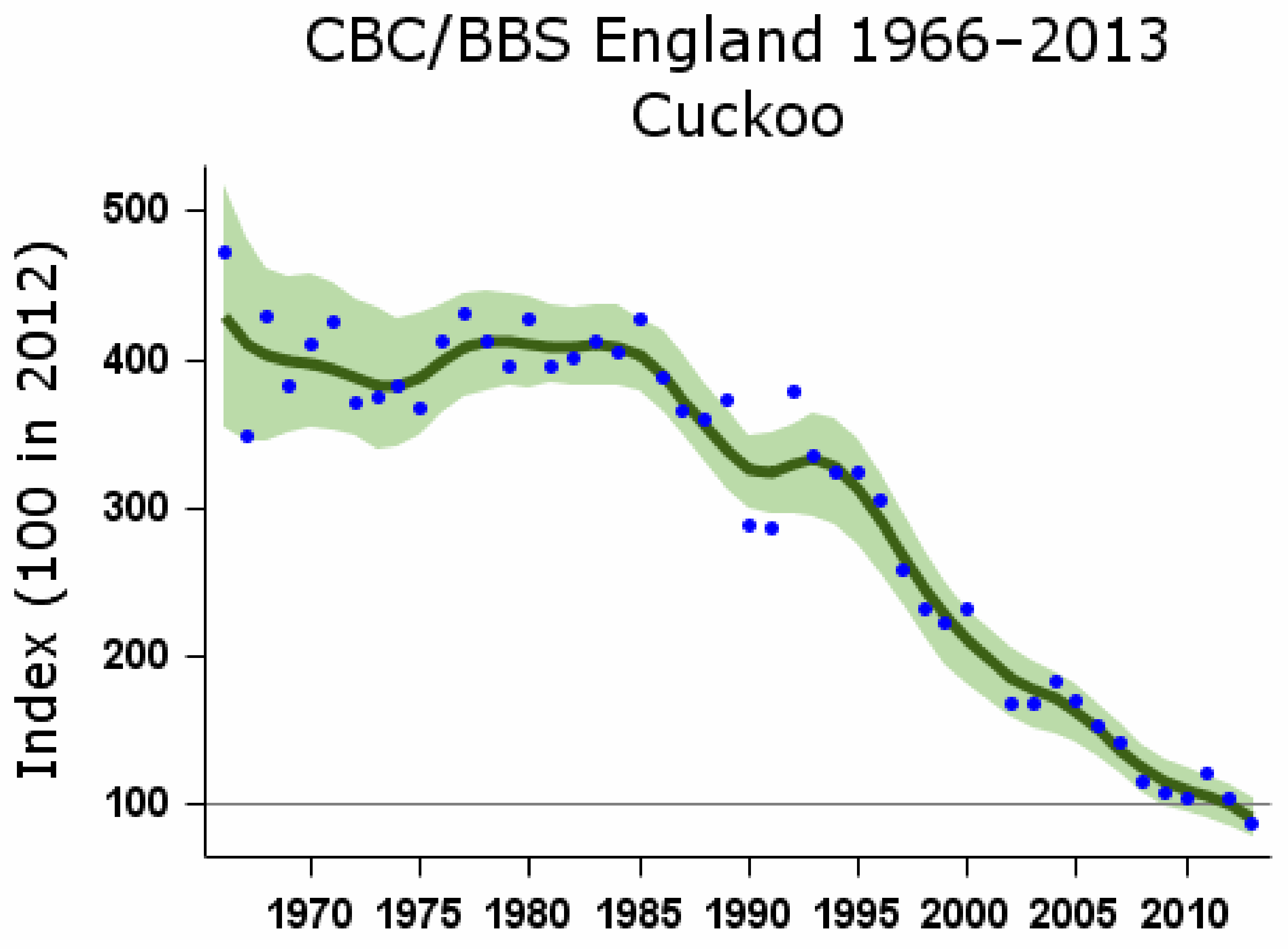
Key facts

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 2009 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 appeared until very recently tc be stable. The BBS Newson et al. 2009). There has been widespread moderate decline across Europe since 1980, although with little change since 2000 (PECBMS 2014a).



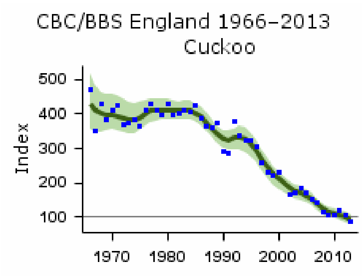
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

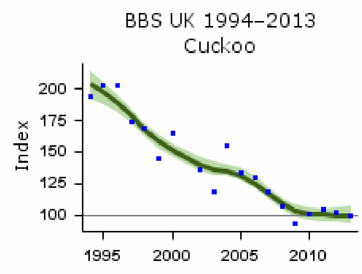
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	45	1967-2012	296	-76	-83	-66	>50	
	25	1987-2012	454	-73	-78	-69	>50	
	10	2002-2012	531	-46	-49	-42	>25	
	5	2007-2012	530	-27	-31	-23	>25	
BBS UK	17	1995-2012	718	-49	-54	-44	>25	
	10	2002-2012	685	-28	-36	-22	>25	
	5	2007-2012	690	-14	-21	-8		
BBS England	17	1995-2012	567	-68	-71	-65	>50	
	10	2002-2012	531	-46	-50	-42	>25	
	5	2007-2012	530	-27	-32	-22	>25	
BBS Scotland	17	1995-2012	73	3	-19	26		
	10	2002-2012	75	-6	-20	9		
	5	2007-2012	84	-7	-21	7		
BBS Wales	17	1995-2012	57	-43	-63	-25	>25	
	10	2002-2012	58	-15	-30	-1		
	5	2007-2012	56	-6	-23	11		

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

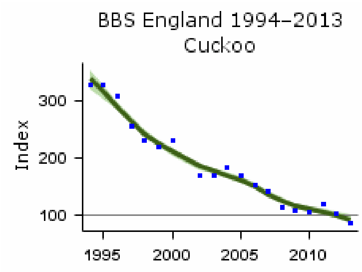
BTO JNCC rspb The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



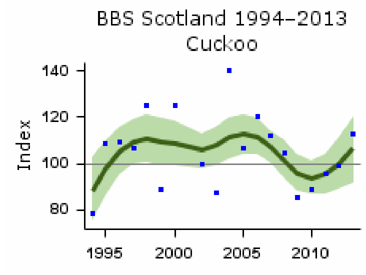
CBC/BBS England graph



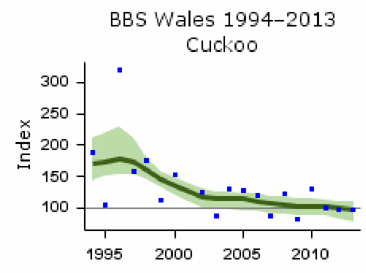
BBS UK graph



BBS England graph

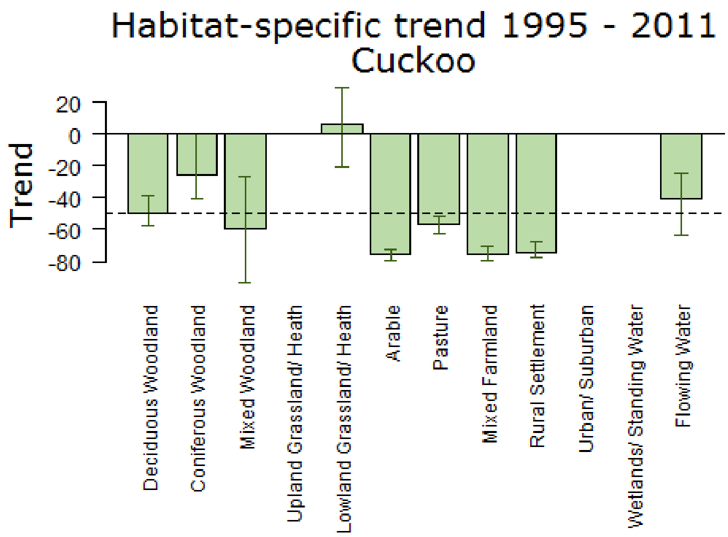


BBS Scotland graph



BBS Wales graph

Population trends by habitat



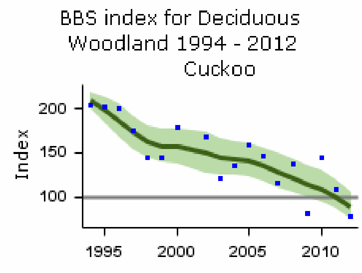
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

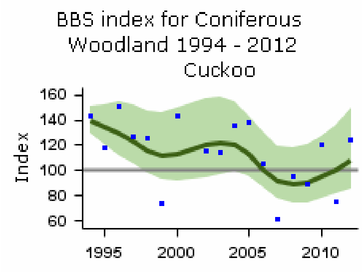
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	130	-49	-57	-39
Coniferous Woodland	16	1995-2011	52	-26	-41	0
Mixed Woodland	16	1995-2011	65	-60	-93	-27
Lowland Grassland/ Heath	16	1995-2011	58	6	-21	29
Arable	16	1995-2011	148	-76	-79	-72
Pasture	16	1995-2011	242	-57	-63	-51
Mixed Farmland	16	1995-2011	109	-75	-80	-71
Rural Settlement	16	1995-2011	113	-74	-78	-68
Flowing Water	16	1995-2011	79	-40	-63	-24

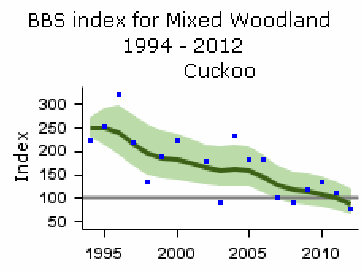
Further information on habitat-specific trends, please follow link here.



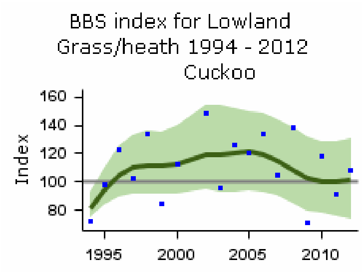
Habitat graph



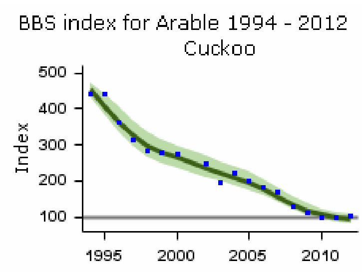
Habitat graph



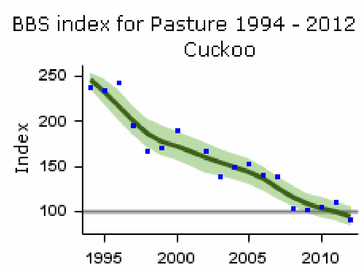
Habitat graph



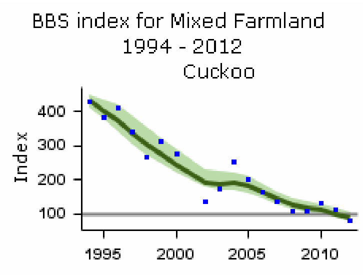
Habitat graph



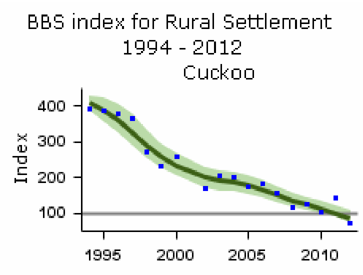
Habitat graph



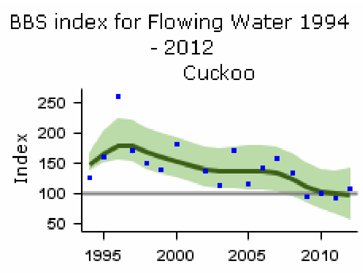
Habitat graph



Habitat graph



Habitat graph



Habitat graph

Demographic trends

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

Causes of change

It is unclear 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	Agricultural intensification	

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 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 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, Denerley 2014), following the rapid declines of many British moth species (Conrad et al. 2006), important prey items in Cuckoo diet.

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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: possible decline
Population size:	4,000 (3,000-5,000) pairs in 1995-97 (APEP13: Toms et al. 2001)

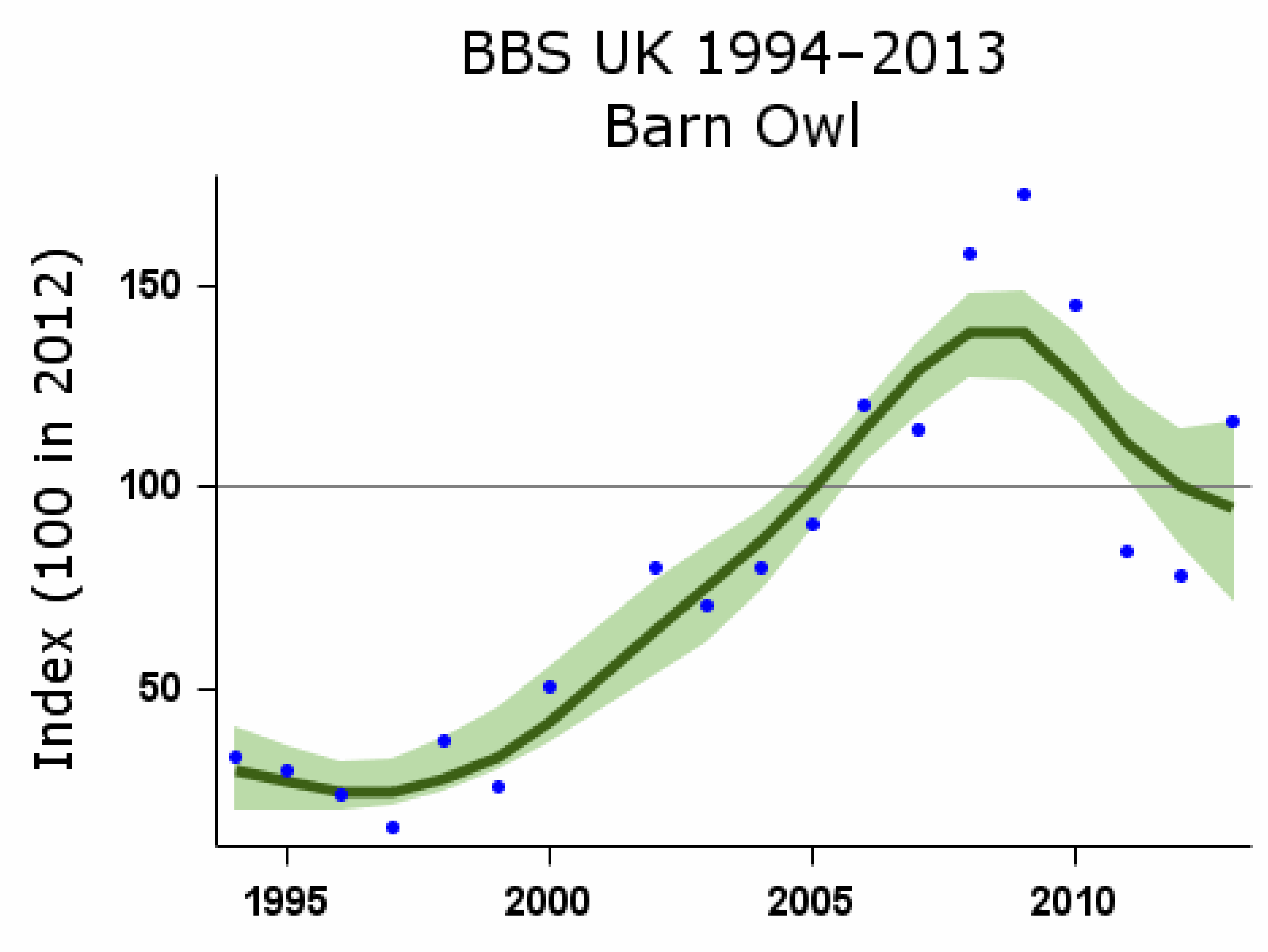
Migrant status:	Resident
Nesting habitat:	Cavity nester
Primary breeding habitat:	Farmland
Secondary breeding habitat:	
Breeding diet:	Animal
Winter diet:	Animal

Status summary

An early population estimate for 1932 of 12,000 breeding pairs in England and Wales concluded that there had been substantial decline over the previous 30-40 years Blaker (1933, 1934). Decline continued through the 1950s and 1960s (Prestt 1965, Parslow 1973). The 1968-72 Atlas suggested a population of 4,500-9,000 pairs (Sharrock 1976) and the 1988-91 Atlas estimated a 37% loss of occupied 10-km squares in Britain since then (Gibbons et al. 1993). Project Barn Owl, organised jointly by BTO and Hawk and Owl Trust and carried out during 1995-97, estimated 4,000 pairs in the UK, Isle of Man and Channel Islands (Toms 1997, Toms et al. 2000, 2001). The potential for breeding numbers to double or halve over periods as short as 3-4 years, due to the cycles of vole abundance (Taylor et al. 1988), hampers the interpretation of such studies. The lack of detailed demographic data for this species was addressed by the BTO's Dadam et al. 2011).

Numbers of Barn Owls recorded via BBS have increased strongly 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).

Data from the BTO Nest Record Scheme show a large reduction in nest failures and an increase in fledglings per breeding attempt.



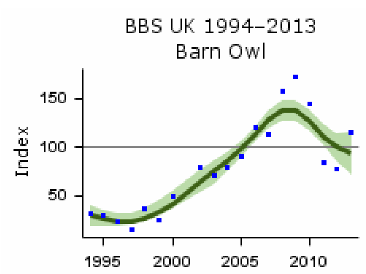
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

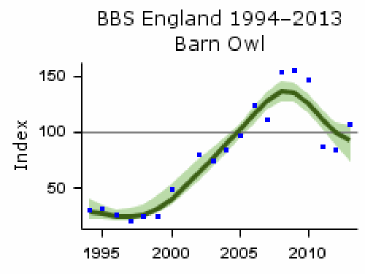
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	17	1995-2012	47	277	153	494		
	10	2002-2012	63	55	10	128		
	5	2007-2012	76	-22	-36	-6		
BBS England	17	1995-2012	44	273	164	406		
	10	2002-2012	61	54	20	93		
	5	2007-2012	74	-22	-34	-10		

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

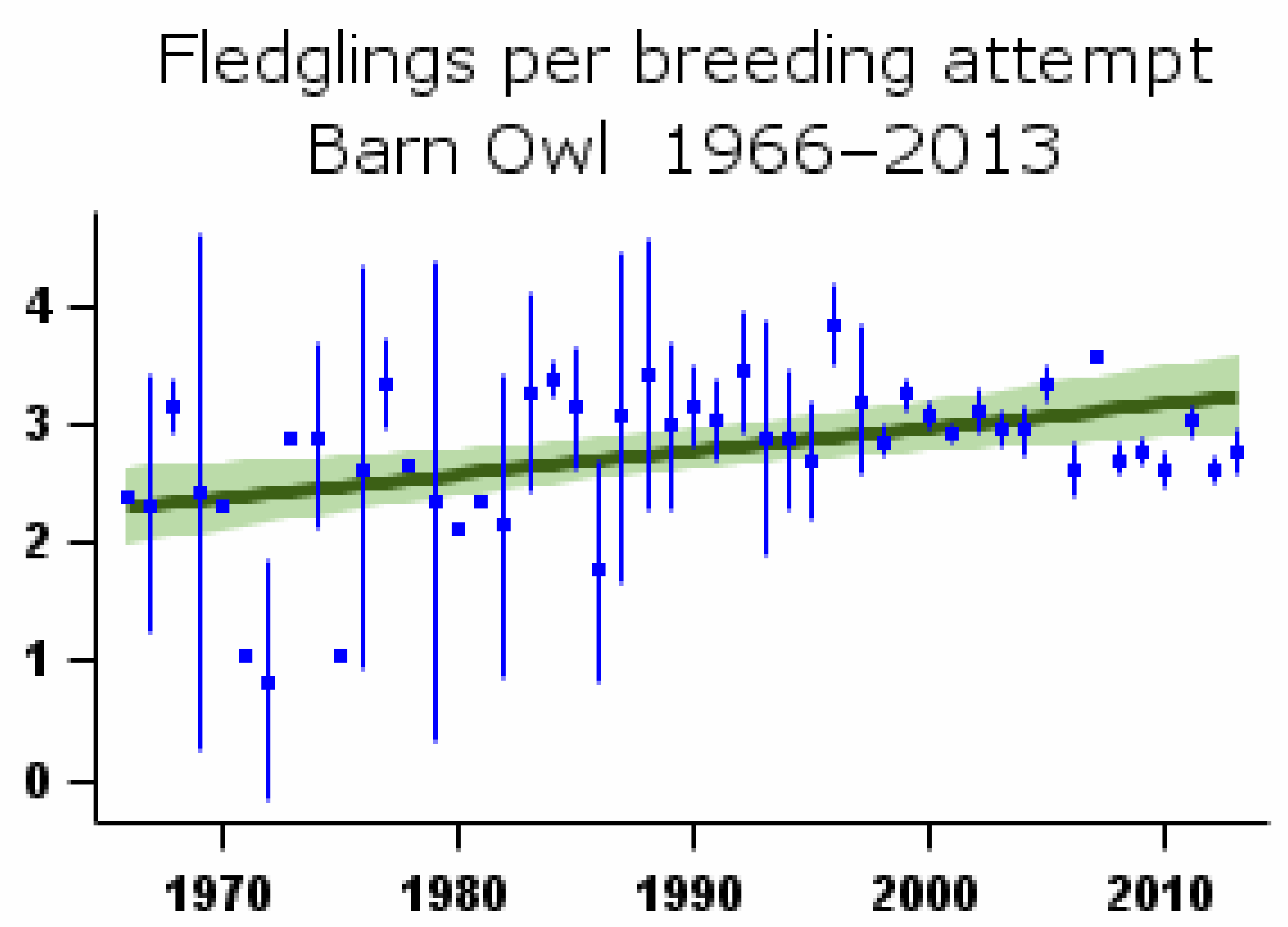


BBS UK graph

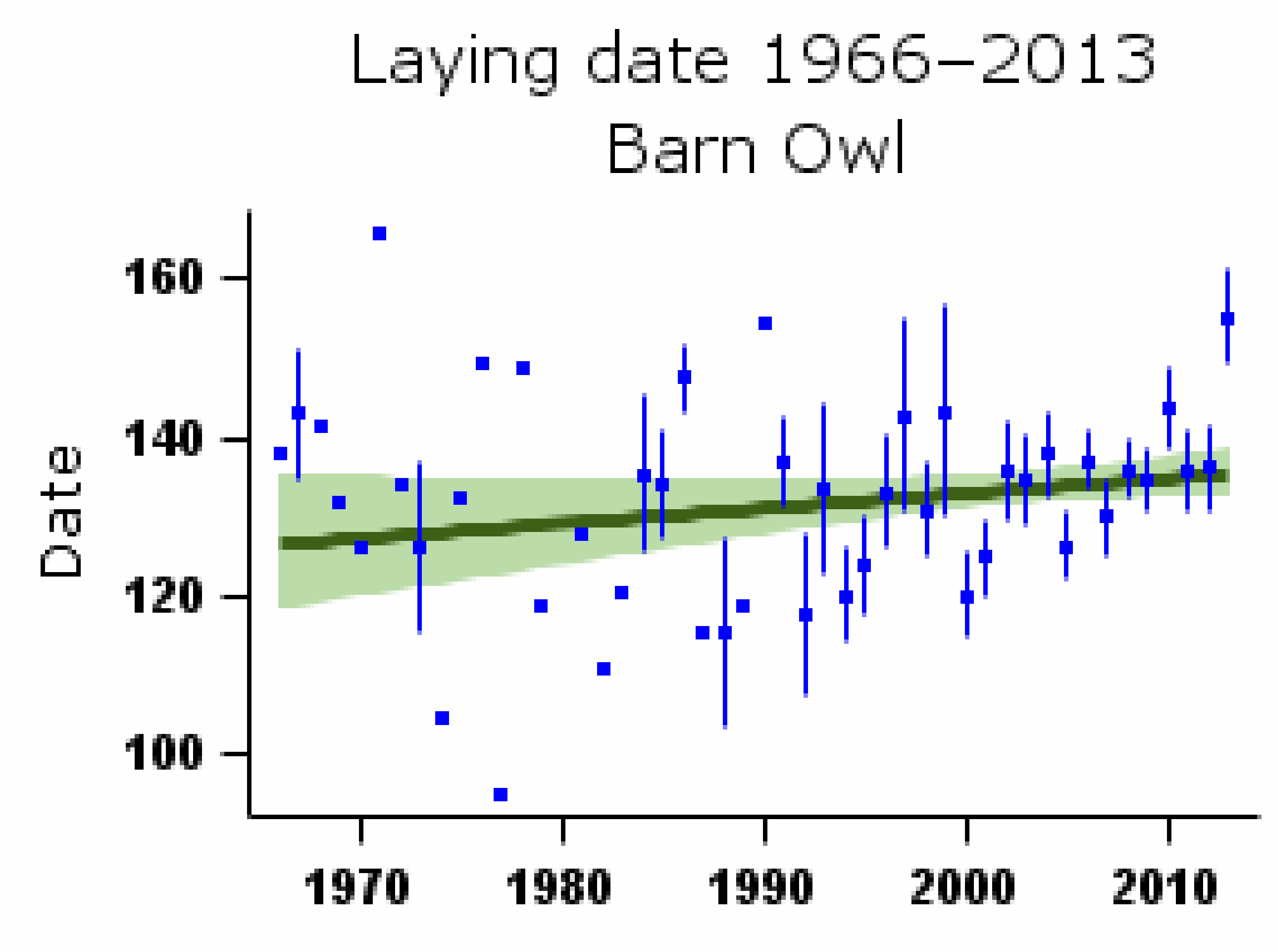


BBS England graph

Demographic trends



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

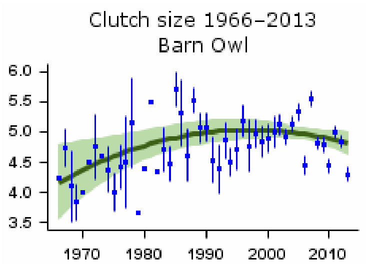


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

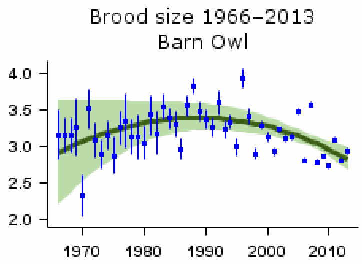
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	30	Linear increase	2.35 fledglings	3.22 fledglings	37.1%		
Clutch size	44	1968-2012	45	Curvilinear	4.28 eggs	4.83 eggs	13.1%		
Brood size	44	1968-2012	368	Curvilinear	3.00 chicks	2.88 chicks	-4.0%		
Nest failure rate at egg stage	44	1968-2012	30	Linear decline	0.76% nests/day	0.05% nests/day	-93.4%		Small sample
Nest failure rate at chick stage	44	1968-2012	138	Curvilinear	0.31% nests/day	0.03% nests/day	-90.3%		
Laying date	44	1968-2012	19	None			0 days		Small sample

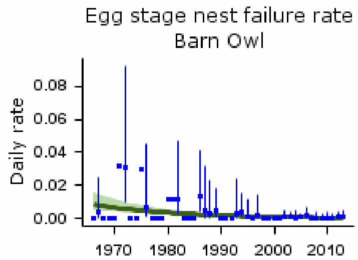
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



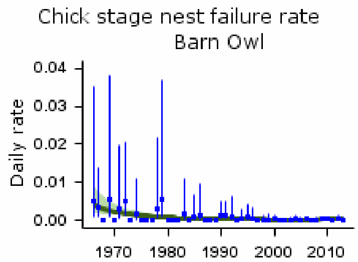
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



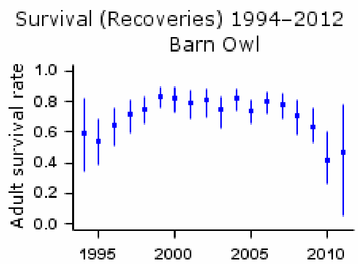
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



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 based on dead recoveries of ringed birds - error bars represent 95% confidence limits

Causes of change

The use of toxic farm chemicals, loss of hunting habitat, increased disturbance, hard winters and the increase in traffic collisions have all been suggested as possible reasons for decline, but clear evidence is lacking. The upturn over recent decades has been aided by conservation measures including the widespread erection of nestboxes.

Change factor	Primary driver	Secondary driver
Demographic	Overwinter survival	
Ecological	Other	

Further information on causes of change

Decline during the 1950s and 1960s was probably associated with use of toxic farm chemicals (especially organochlorine seed dressings), but also loss of hunting habitat, increased disturbance and the hard winters of 1946/47 and 1962/63 (Dobinson & Richards 1964, Percival 1990).

Causes of mortality potentially linked to the species' further decline include poisoning (Shawyer 1985) and collision with road traffic (Bourquin 1983, Massemin & Zorn 1998, Shawyer & Dixon 1999). Barn Owls are vulnerable to secondary poisoning from ingesting rodents killed by 'second-generation' rodenticides, which are used to control warfarin-resistant brown rats Rattus norvegicus (Shawyer 1985, 1987, Harrison 1990). Toxicological studies found that a small proportion of dead Barn Owls contained potentially lethal doses of rodenticide (Newton et al. 1991; Newton & Wyllie 1992a). There is no clear evidence, however, that links either poisoning or traffic collisions to population changes.

More recently, the erection of Barn Owl nestboxes, already numbering c. 25,000 by the mid 1990s, may have 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 (Dadam et al. 2011). In earlier decades, the plight of such a charismatic and popular bird led to extensive releasing of captive-bred birds in unguided 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 never joined the nesting population (Balmer et al. 2000). There is some evidence, however, that releases might have aided population recovery (Meek et al. 2003).

The Barn Owl is a specialist predator of small mammals, in particular voles, mice, shrews and small rats (Shawyer 1998), but frogs and small birds are also taken (Bunn et al. 1982). The field vole Microtus agrestis, the most important prey of Barn Owls in mainland Britain (Glue 1974), favours grassy cover and a thick litter layer (Hansson 1977). In the UK, positive relationships were found between abundance of small mammals and sward height (Askew et al. 2007), whilst other authors have found a positive correlation between bank voles Clethrionomys glareolus and the width of grassy field margins (Shore et al. 2005). In Switzerland a similar result was found between unmown wildflower and herbaceous strips and densities of small mammals Aschwanden et al. (2007). Foraging of Barn Owl in an arable landscape is largely restricted to uncultivated or ungrazed field margins (Andries et al. 1994, Tome & Valkama 2001). It has been estimated that Barn Owls breeding in arable landscapes need about 35 km of rough grass margins, 4-6 m wide, within 2 km of the nest sites for the population to remain stable (Askew 2006).

Variation in adult survival contributes most to annual population changes (Robinson et al. 2014). Barn Owls experience reduced hunting opportunities in snowy or wet weather (Shawyer 1987). The recent downturn, after two decades of positive trend, may have resulted from a series of cold winters, during which higher-than-average numbers of individuals were reported dead (Clark 2011, Demog Blog). Poor hunting conditions in spring and summer may decrease adult or chick survival or reduce adult body condition, with associated lower investment in reproduction or, in some cases, the suspension of breeding (Shawyer 1987). Vegetation growth may also be affected by cold weather, with implications for the abundance or availability of small mammal prey (Shawyer 1987, Clark 2011).

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

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Little Owl

Athene noctua

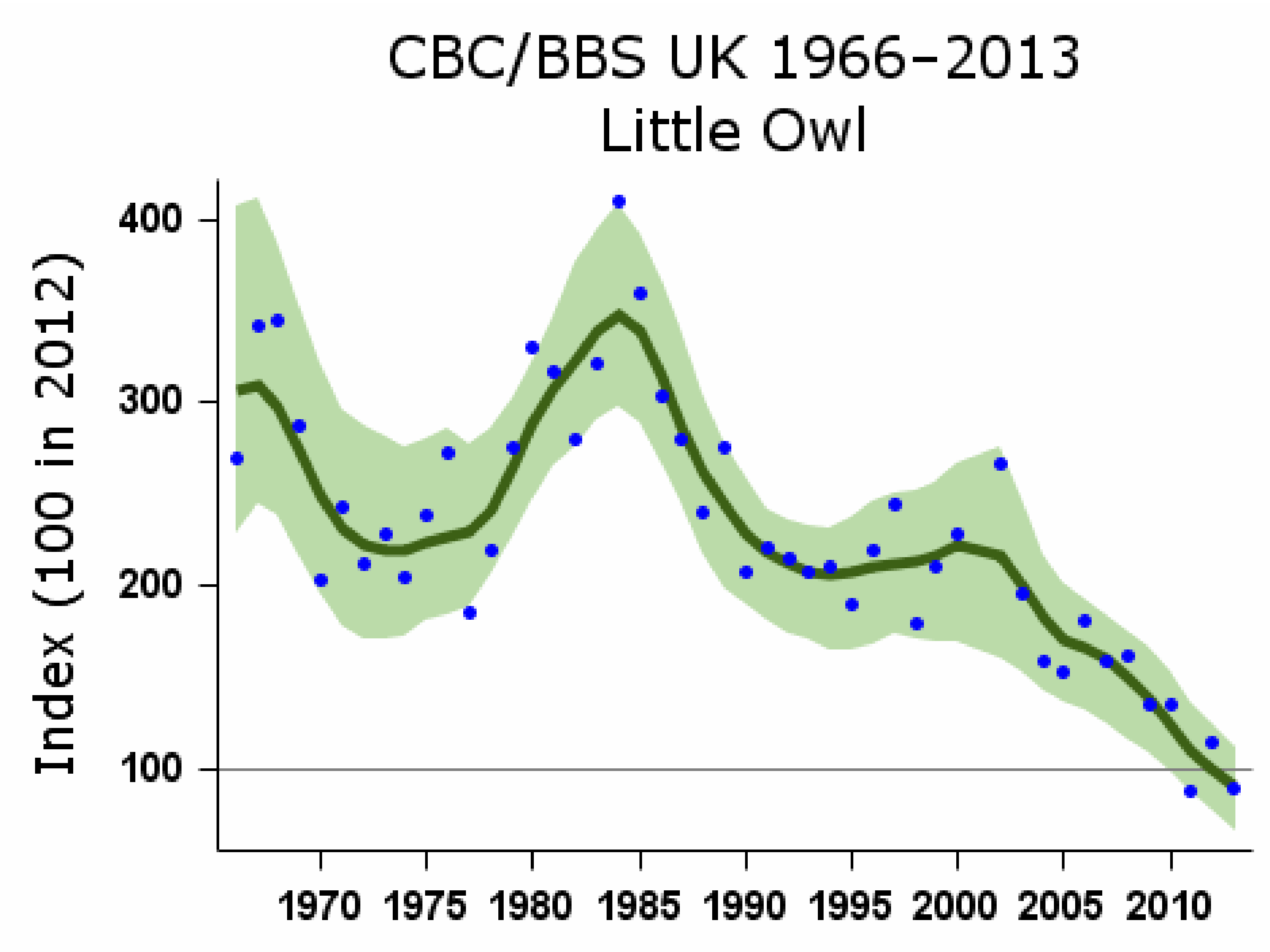
Key facts

Conservation listings:	Europe: SPEC category 3 (declining) (BiE04) UK: not listed (introduced)
Long-term trend:	UK, England: rapid 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 decades suggests that a rapid decline now lies behind the observed fluctuations. Trends are unusually uncertain, 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. An independent BBS estimate is for c5,700 pairs in 2009, since when substantial further decrease has occurred.



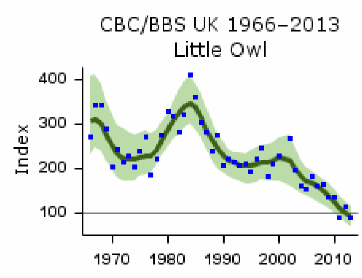
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

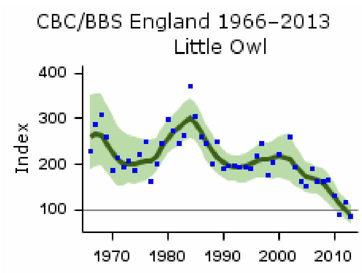
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	45	1967-2012	60	-68	-82	-50	>50	
	25	1987-2012	86	-65	-76	-52	>50	
	10	2002-2012	102	-54	-64	-40	>50	
	5	2007-2012	102	-37	-47	-27	>25	
CBC/BBS England	45	1967-2012	58	-62	-77	-37	>50	
	25	1987-2012	83	-60	-70	-45	>50	
	10	2002-2012	100	-53	-62	-39	>50	
	5	2007-2012	100	-40	-47	-29	>25	
BBS UK	17	1995-2012	100	-50	-59	-38	>50	
	10	2002-2012	102	-53	-63	-42	>50	
	5	2007-2012	102	-36	-46	-25	>25	
BBS England	17	1995-2012	97	-50	-59	-39	>25	
	10	2002-2012	100	-52	-63	-39	>50	
	5	2007-2012	100	-39	-46	-27	>25	

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

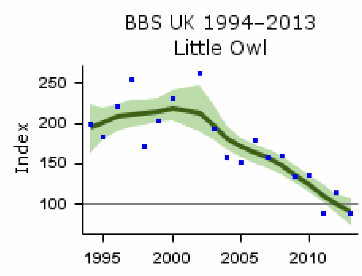
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



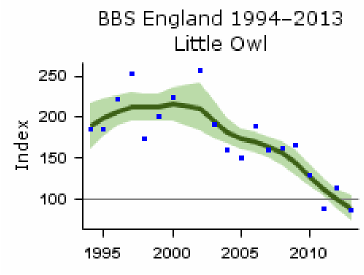
CBC/BBS UK graph



CBC/BBS England graph

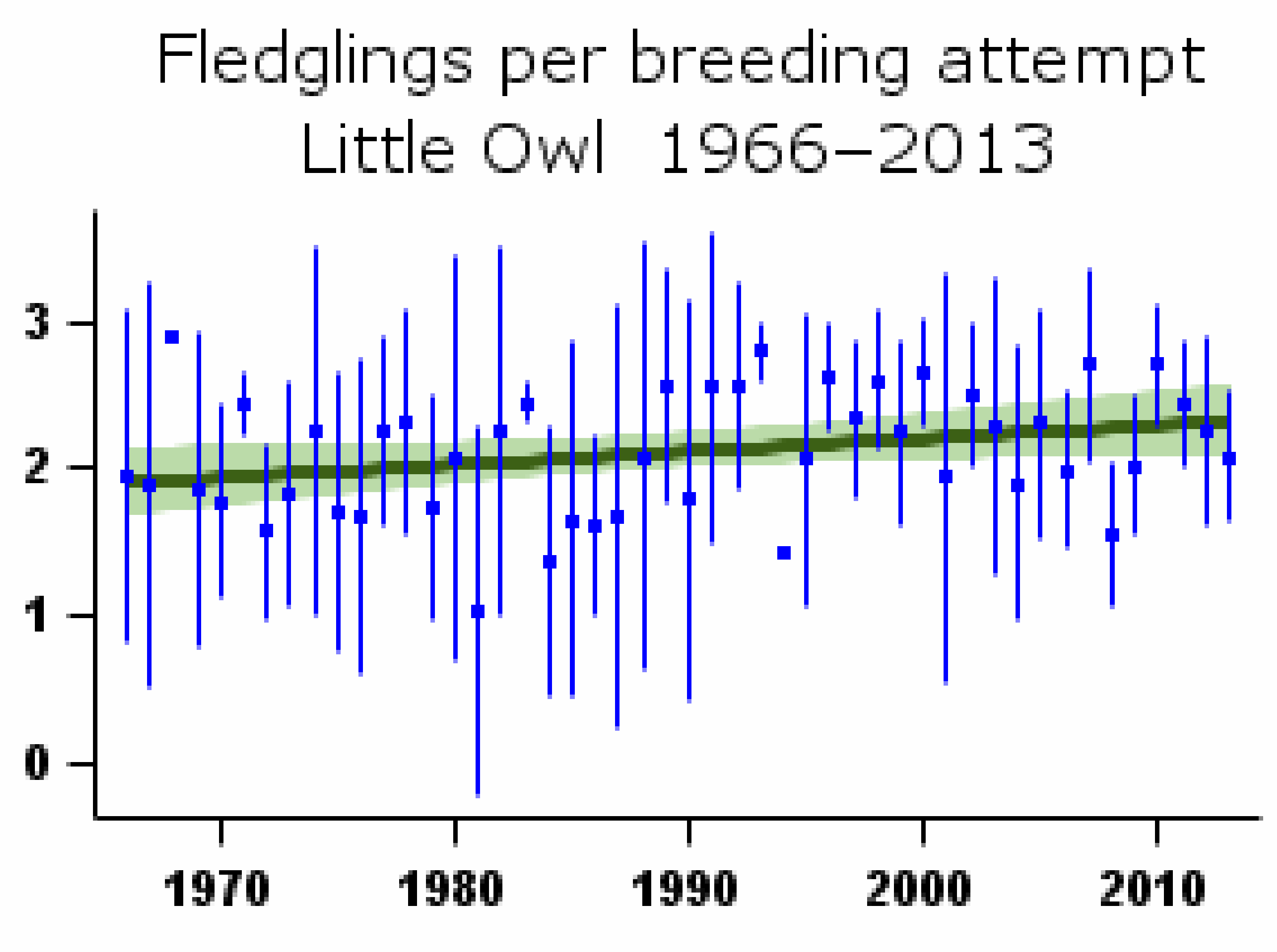


BBS UK graph

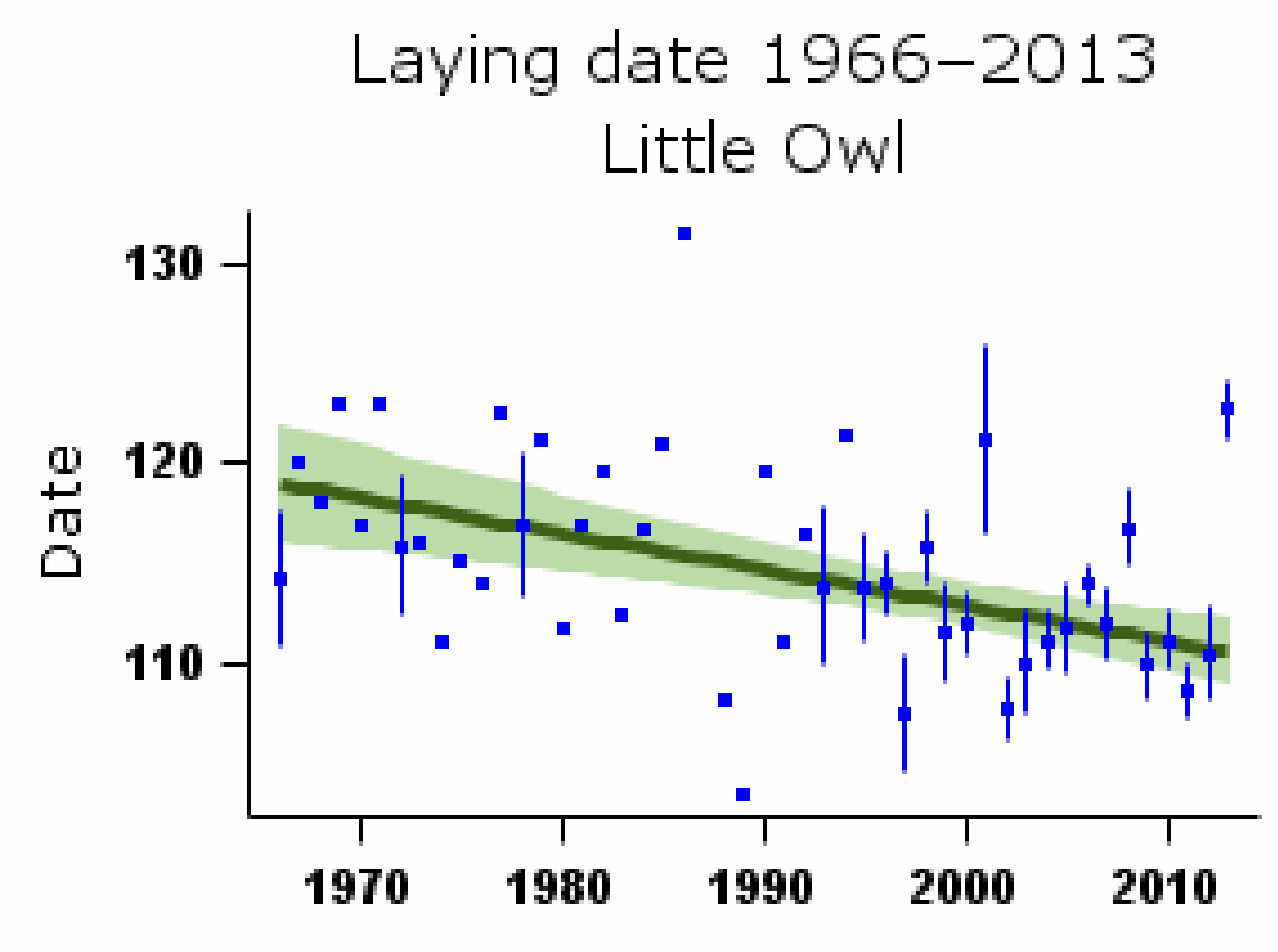


BBS England graph

Demographic trends



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

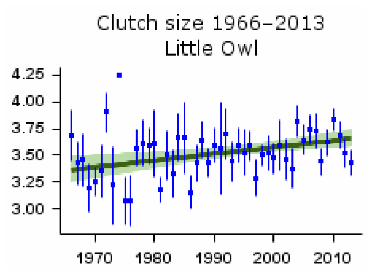


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

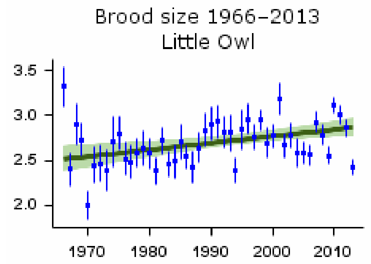
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	18	None					
Clutch size	44	1968-2012	23	Linear increase	3.38 eggs	3.65 eggs	8.1%		Small sample
Brood size	44	1968-2012	48	Linear increase	2.53 chicks	2.86 chicks	13.1%		
Nest failure rate at egg stage	44	1968-2012	19	None					Small sample
Nest failure rate at chick stage	44	1968-2012	22	None					Small sample
Laying date	44	1968-2012	8	Linear decline	Apr 29	Apr 21	-8 days		Small sample

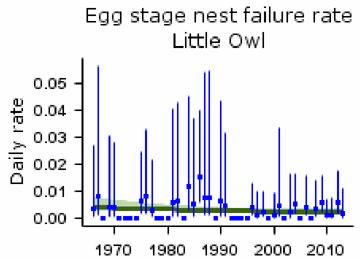
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



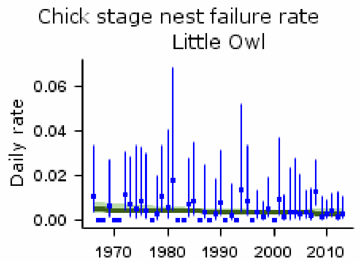
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



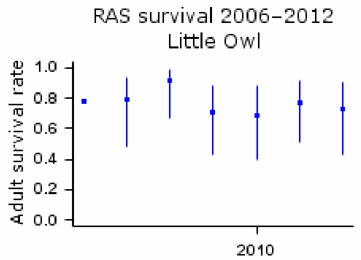
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



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



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 falling rates of juvenile survival. Circumstantial evidence suggests that this may be occurring 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 and brood sizes have shown linear increase, but no trends were apparent in nest failure rates (see above). There is very little evidence available from the UK regarding causes of the population decline. However, evidence from mainland 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.

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Tawny Owl

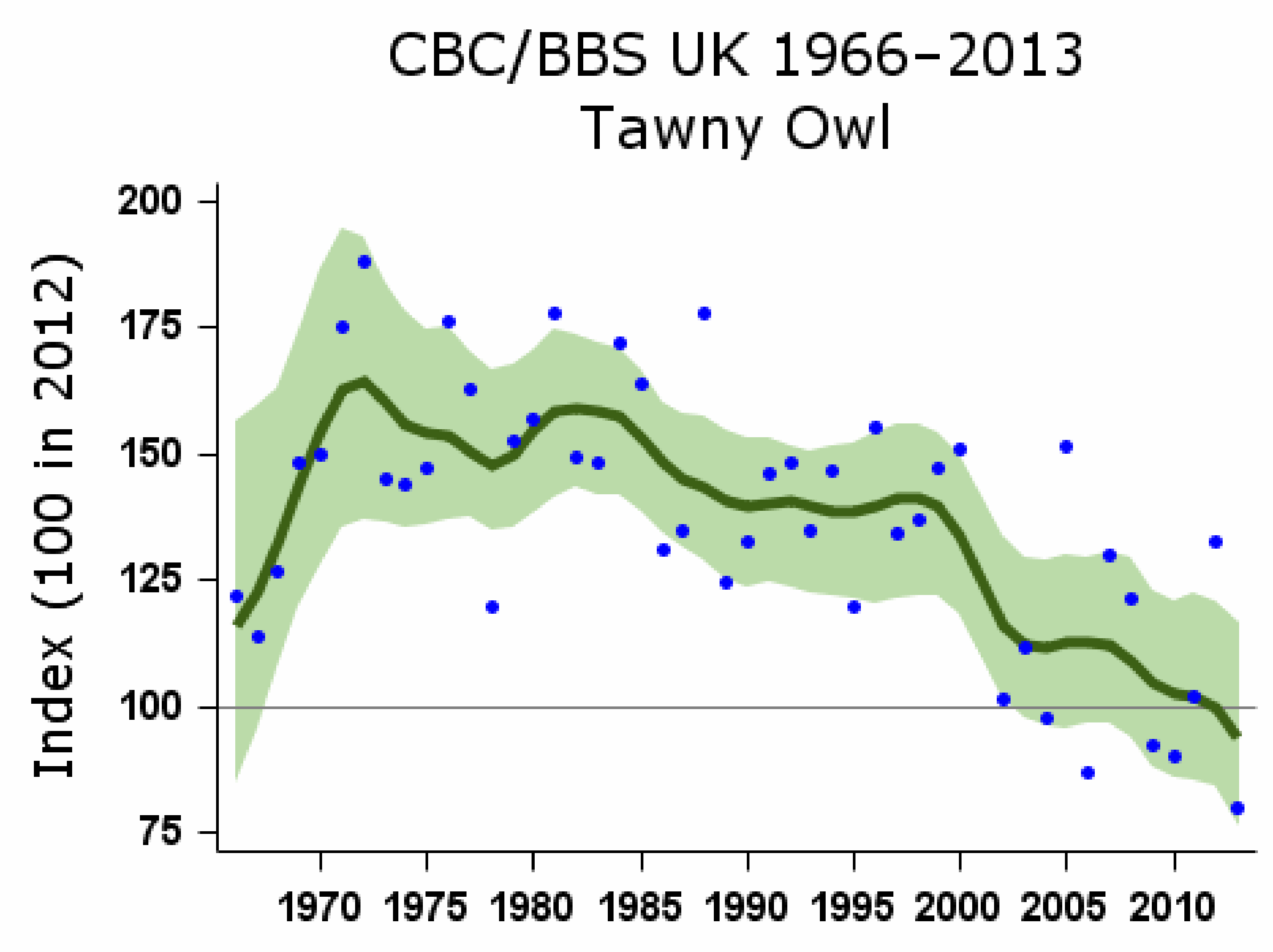
Strix aluco

Key facts

Conservation listings:	Europe: no SPEC category (concentrated in Europe, conservation status favourable) (BiE04) UK: green (BoCC3)
Long-term trend:	UK: shallow decline England: fluctuating, with no long-term trend
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 first two atlas periods, though these losses are now largely reversed (Balmer et al. 2013a). 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 (Freeman et al. 2007a), following methodology established by an earlier survey in 1989 (Percival 1990). Integrated population modelling shows that all stages of the life cycle, including elements of both productivity and survival, make appreciable contributions to annual population change (Robinson et al. 2014). In Kielder Forest, vole numbers began fluctuating with a lower amplitude in the mid 1990s: the loss of productivity in years when voles are abundant may ultimately drive the Tawny Owl population there towards extinction (Millon et al. 2014).



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

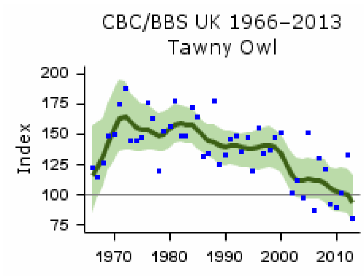
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	45	1967-2012	80	-19	-49	26		

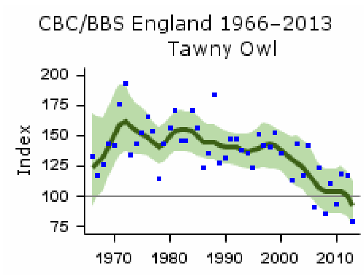
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	25	1987-2012	98	-31	-45	-13	>25	
	10	2002-2012	100	-14	-27	6		
	5	2007-2012	114	-11	-24	7		
CBC/BBS England	45	1967-2012	68	-21	-50	22		
	25	1987-2012	84	-31	-46	-11	>25	
	10	2002-2012	87	-23	-35	-4		
	5	2007-2012	98	-6	-20	11		
BBS UK	17	1995-2012	94	-25	-40	-7	>25	Nocturnal species
	10	2002-2012	100	-14	-28	6		Nocturnal species
	5	2007-2012	114	-9	-22	8		Nocturnal species
BBS England	17	1995-2012	80	-26	-42	-6	>25	Nocturnal species
	10	2002-2012	87	-23	-37	-6		Nocturnal species
	5	2007-2012	98	-7	-20	6		Nocturnal species

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

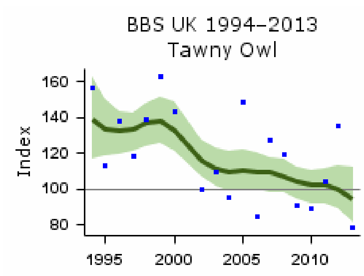
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



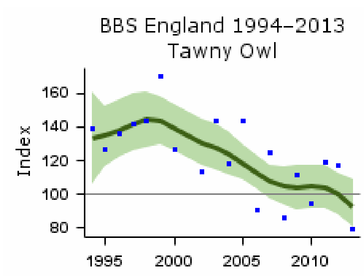
CBC/BBS UK graph



CBC/BBS England graph

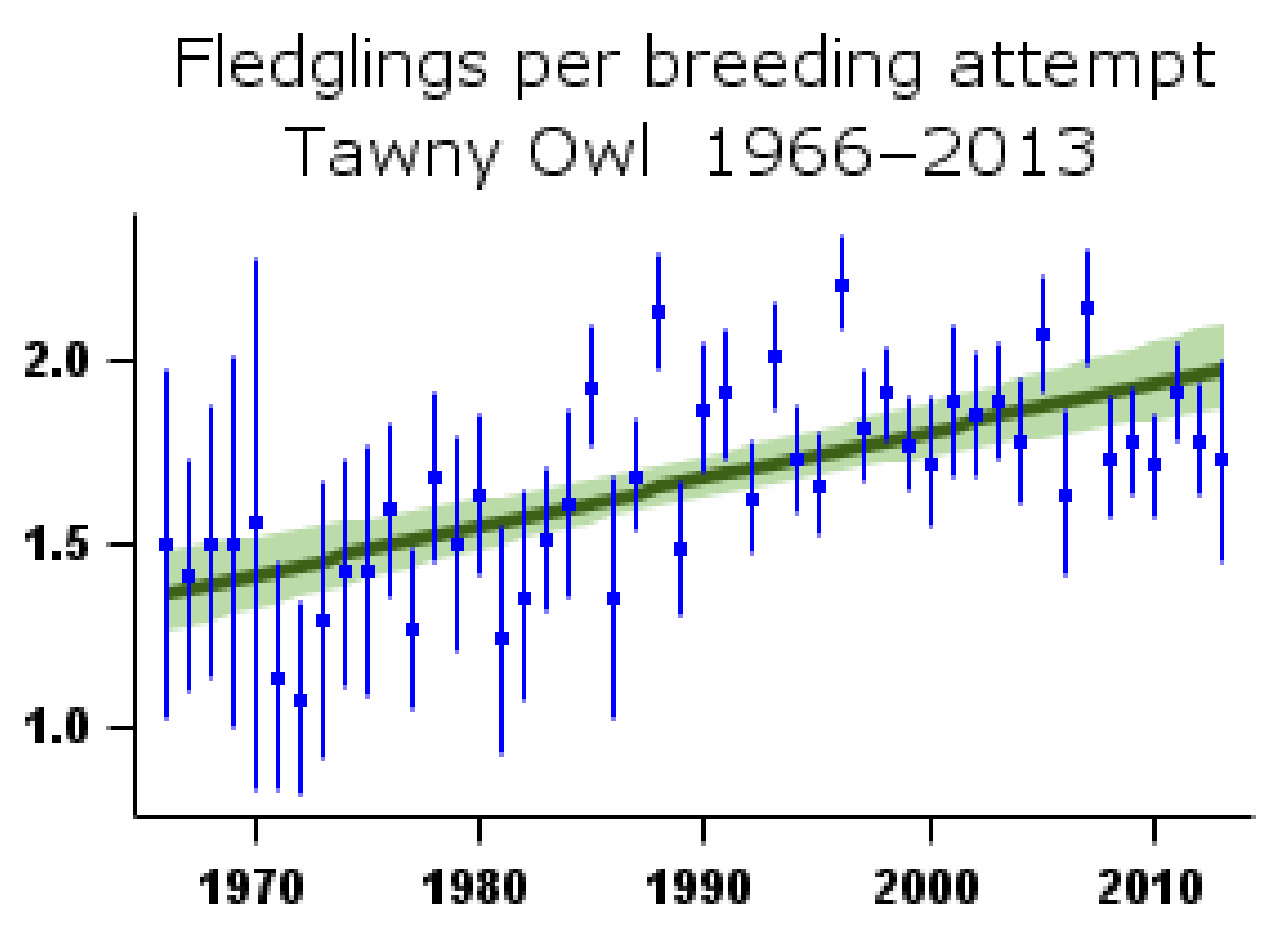


BBS UK graph

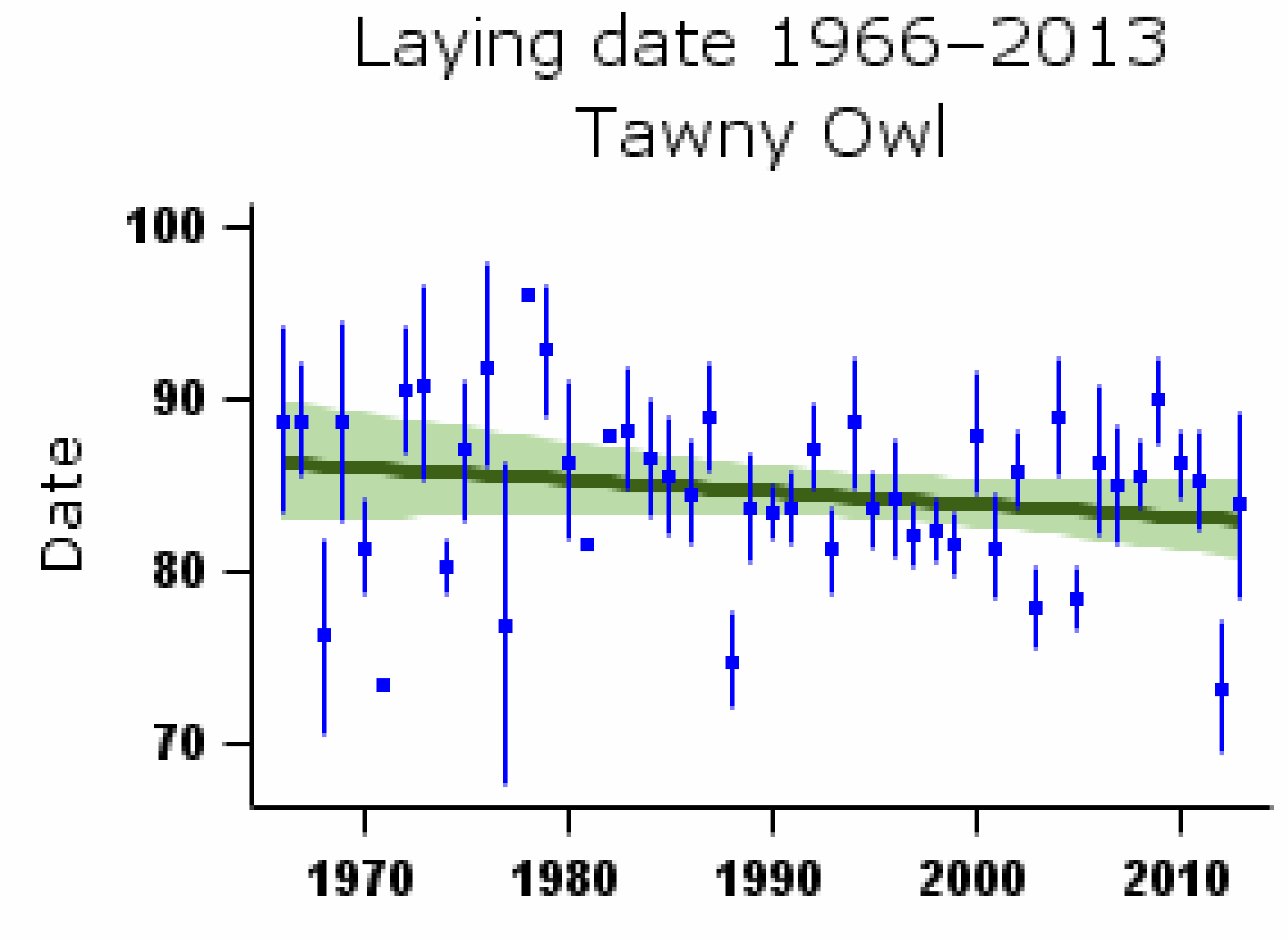


BBS England graph

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

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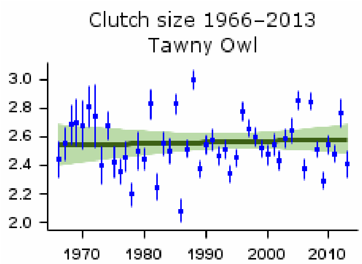
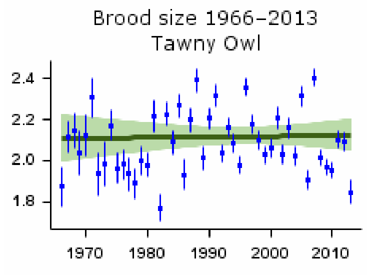
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	67	Linear increase	1.39 fledglings	1.97 fledglings	41.5%		
Clutch size	44	1968-2012	100	None					
Brood size	44	1968-2012	201	None					
Nest failure rate at egg stage	44	1968-2012	67	Curvilinear	1.09% nests/day	0.22% nests/day	-79.8%		
Nest failure rate at chick stage	44	1968-2012	101	Linear decline	0.48% nests/day	0.15% nests/day	-68.8%		
Laying date	44	1968-2012	19	None			0 days		Small sample

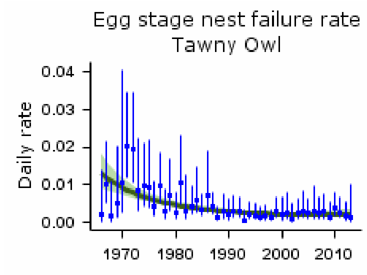
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



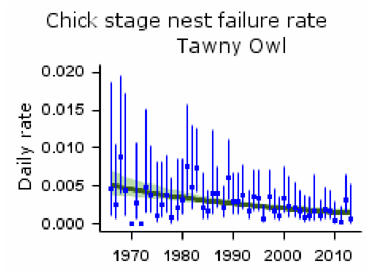
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



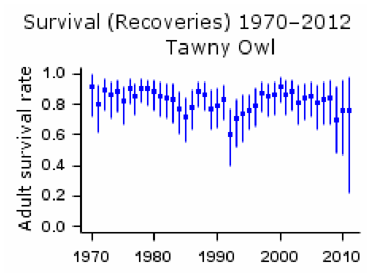
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



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 based on dead recoveries of ringed birds - error bars represent 95% confidence limits

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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: priority species
Long-term trend:	UK: uncertain
Population size:	4,600 (3,700-5,500) males in 2004 (APEP13: Conway et al. 2007)

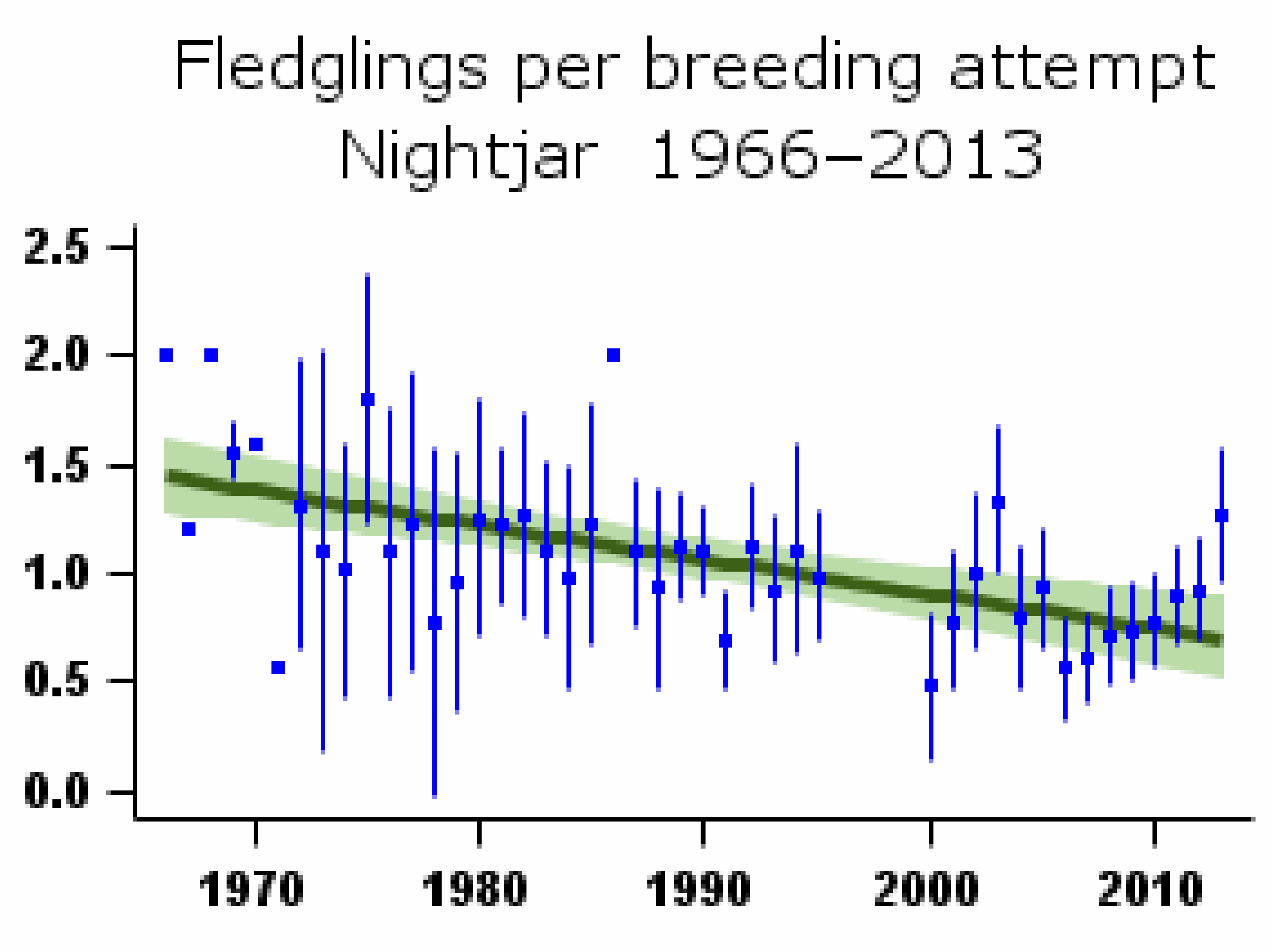
Status summary

Following a catastrophic decline in range of more than 50% of 10-km squares between the 1968-72 and 1988-91 breeding atlases, the 1992 national survey revealed a welcome increase of 50% in population size since an earlier survey in 1981 (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. Atlas data from 2008-11 show an 18% range increase in Britain since 1988-91 but some parts of the 1968-72 range remain unoccupied (Balmer et al. 2013). Although annual nest record sample are very small, the increases in nest failure rates and decreases in clutch size 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.

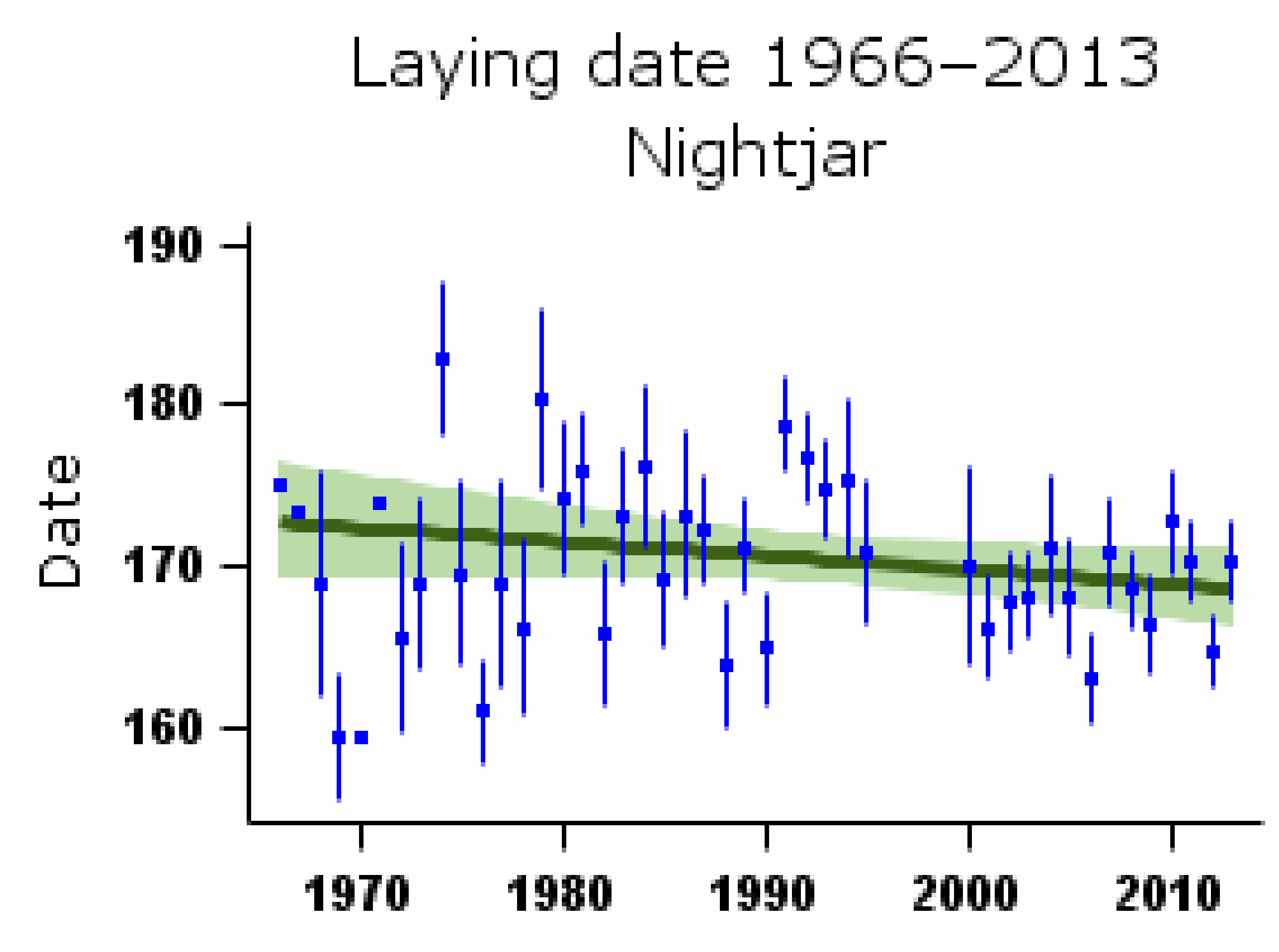
Population changes in detail

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

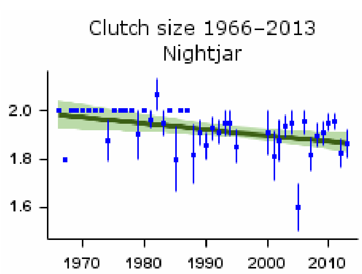


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

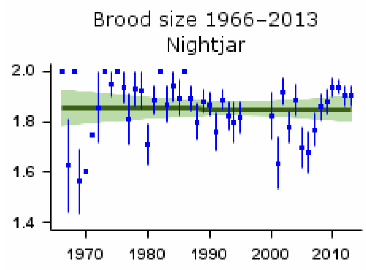
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	22	Linear decline	1.41 fledglings	0.72 fledglings	-49.2%		
Clutch size	44	1968-2012	19	Linear decline	1.98 eggs	1.86 eggs	-5.6%		Small sample
Brood size	44	1968-2012	28	None					Small sample
Nest failure rate at egg stage	44	1968-2012	25	Linear increase	1.35% nests/day	3.66% nests/day	171.1%		Small sample
Nest failure rate at chick stage	44	1968-2012	23	Curvilinear	0.18% nests/day	0.95% nests/day	427.8%		Small sample
Laying date	44	1968-2012	21	None			0 days		Small sample

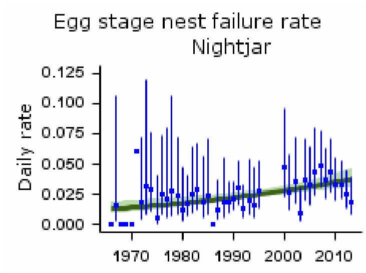
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



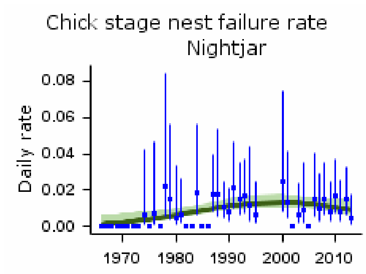
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



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 recovery of this species coincided with the availability of suitable open ground habitat resulting from the felling of forests planted in the late 1920s and 1930s, the clearance and restocking of areas damaged by storms in the late 1980s and the restoration of heathland habitats. Management, protection, restoration and re-creation of key habitats remains critical for maintaining Nightjar numbers.

Change factor	Primary driver	Secondary driver
Demographic	Unknown	
Ecological	Changes in woodland	

Further information on causes of change

The historical population decline and contraction of range have been attributed to large-scale losses of heathland to agriculture, construction and afforestation (Conway et al. 2007, Langston et al. 2007b). Recovery has coincided with more suitable open ground becoming available through the felling of forests planted in the late 1920s and 1930s, the clearance and restocking of areas damaged by storms in 1987 and 1990 and the restoration of heathland (Scott et al. 1998, Ravenscroft 1989, Morris et al. 1994, Conway et al. 2007, Langston et al. 2007b). While most recent increase has been consolidation within the existing range, there has been colonisation of conifer plantations at high altitude in southwest England and on the North York Moors: this might be a density-dependent effect as new habitat becomes available or could be evidence of positive effects of climate change (G.J. Conway pers comm).

Prospects for further recovery may be limited, however, due to a reduction of suitable habitat as newly restocked forests grow and to the effects of human disturbance: studies have found that human disturbance is likely to be affecting territory density (Liley & Clarke 2003) and that nest failure is most likely in areas heavily frequented by walkers and dogs (Langston et al. 2007a), though another study, in Thetford Forest, concluded that recreational disturbance was not a factor in nest failure (Dolman 2010). The Thetford study also observed that all nest predators were mammalian (foxes and badgers), but their impact was unlikely to affect Nightjar population size (Dolman 2010).

Burgess et al. (1990) reported that, at Minsmere, creating glades in woodland and sculpting woodland margins to increase the area of edge habitat, leaving woodland shelter belts standing and providing abundant potential nesting sites, mainly by clearing small patches of heather from the base of small birch trees, resulted in an increase in the Nightjar population. In Thetford Forest, Dolman & Morrison (2012) found that density of Nightjars was highest in areas of restock at pre-thicket stages (6-10 years) and that management of conifer plantations plays an important role in determining the population of Nightjars.

Management, protection, restoration and creation of key habitats remain critical for the long-term conservation of this species (Ravenscroft 1989, Morris et al. 1994, Scott et al. 1998, Conway et al. 2007).

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Swift

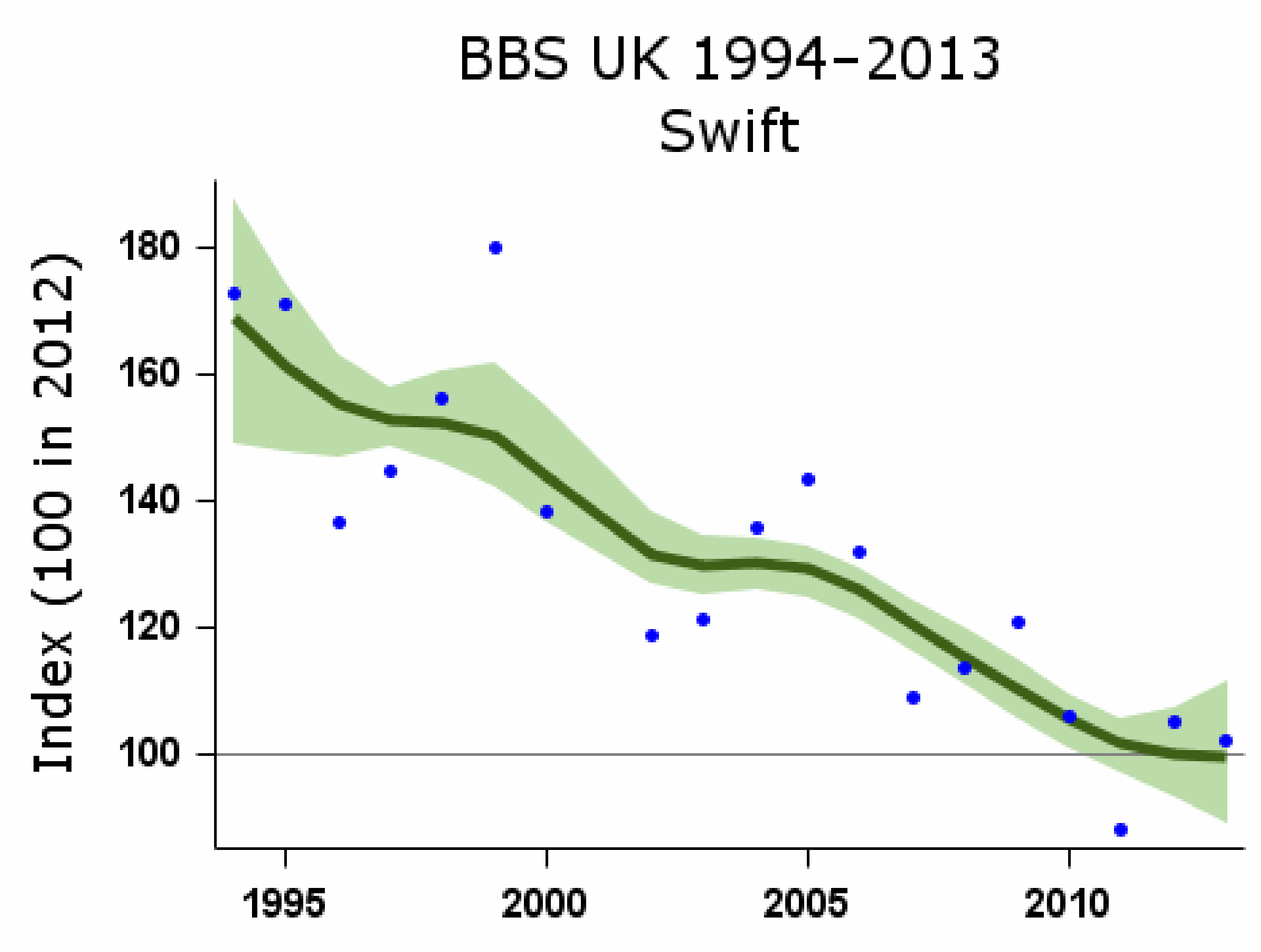
Apus apus

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 indicate that steep declines have occurred in England, Scotland and Wales since 1994. Many Swifts seen on BBS visits will not be nesting nearby, however, and the relationship between BBS transect counts and nesting numbers has not yet been investigated. The BBS Eaton et al. 2009). Modern building design and refurbishment of old buildings can unnecessarily deprive Swifts of nest sites and may be contributing to population decline: the provision of nest boxes and integration of potential nest sites into new buildings and renovations are strongly supported by Crowe 2012). There has been little long-term change across Europe since 1980 (PECBMS 2014a).



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

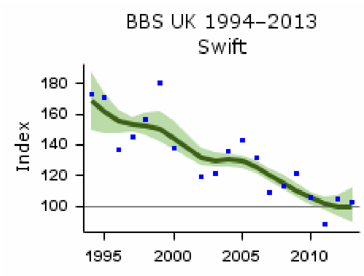
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	17	1995-2012	1046	-38	-46	-30	>25	
	10	2002-2012	1133	-24	-31	-18		
	5	2007-2012	1191	-17	-24	-9		

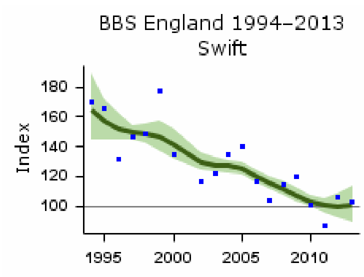
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS England	17	1995-2012	903	-36	-47	-27	>25	
	10	2002-2012	975	-23	-31	-14		
	5	2007-2012	1036	-13	-22	-3		
BBS Scotland	17	1995-2012	53	-62	-70	-48	>50	
	10	2002-2012	59	-36	-49	-15	>25	
	5	2007-2012	64	-46	-53	-31	>25	
BBS Wales	17	1995-2012	66	-43	-58	-10	>25	
	10	2002-2012	71	-34	-48	-10	>25	
	5	2007-2012	66	-1	-19	34		

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

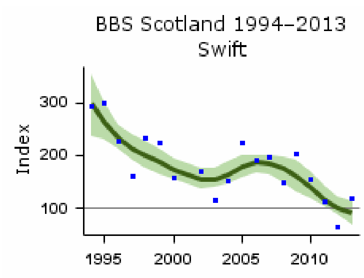
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



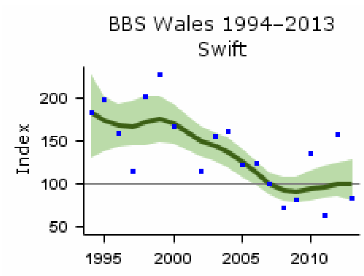
BBS UK graph



BBS England graph

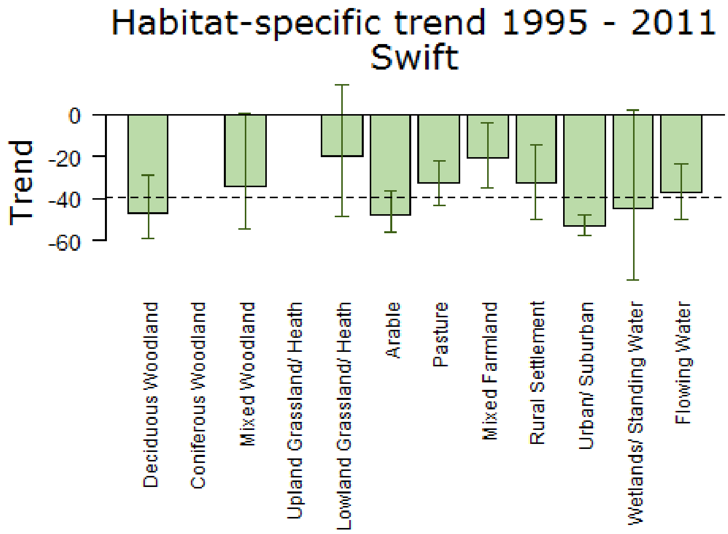


BBS Scotland graph



BBS Wales graph

Population trends by habitat



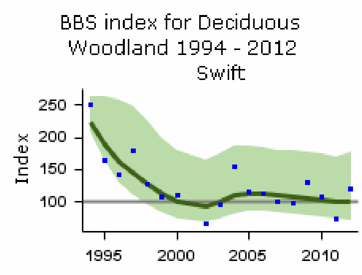
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

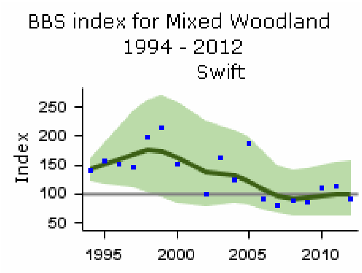
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	152	-47	-59	-29
Mixed Woodland	16	1995-2011	59	-34	-55	1
Lowland Grassland/ Heath	16	1995-2011	47	-20	-48	14
Arable	16	1995-2011	215	-47	-56	-37
Pasture	16	1995-2011	369	-33	-43	-22
Mixed Farmland	16	1995-2011	164	-21	-35	-4
Rural Settlement	16	1995-2011	242	-33	-50	-14
Urban/ Suburban	16	1995-2011	276	-53	-57	-47
Wetlands/ Standing Water	16	1995-2011	39	-45	-79	2
Flowing Water	16	1995-2011	151	-37	-50	-24

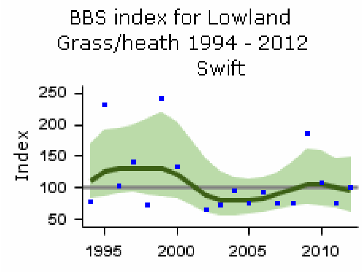
Further information on habitat-specific trends, please follow link here.



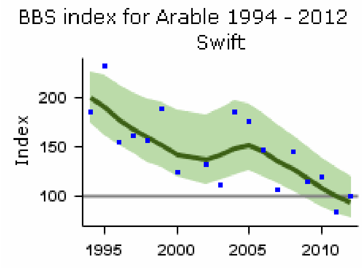
Habitat graph



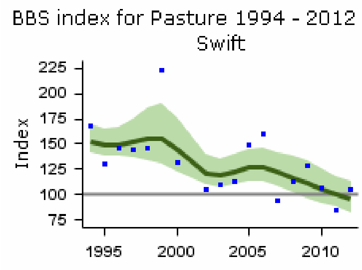
Habitat graph



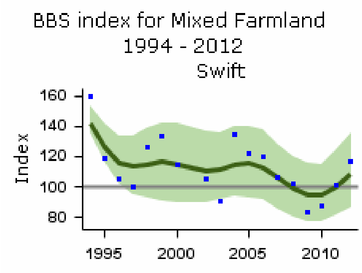
Habitat graph



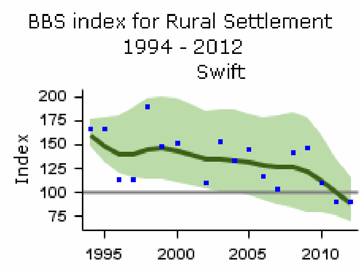
Habitat graph



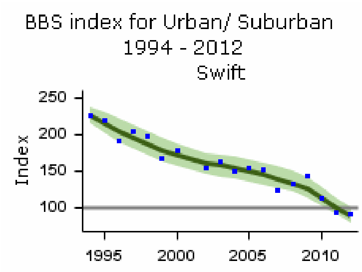
Habitat graph



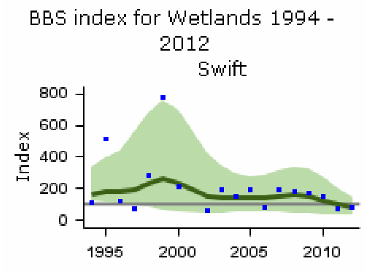
Habitat graph



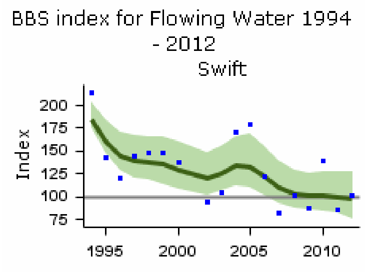
Habitat graph



Habitat graph



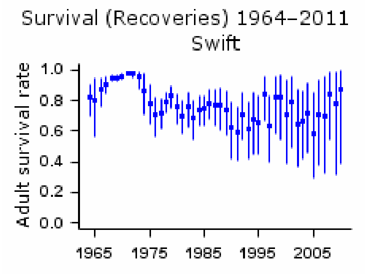
Habitat graph



Habitat graph

Demographic trends

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



Proportion of adult birds surviving to following year based on dead recoveries of ringed birds - error bars represent 95% confidence limits

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Kingfisher

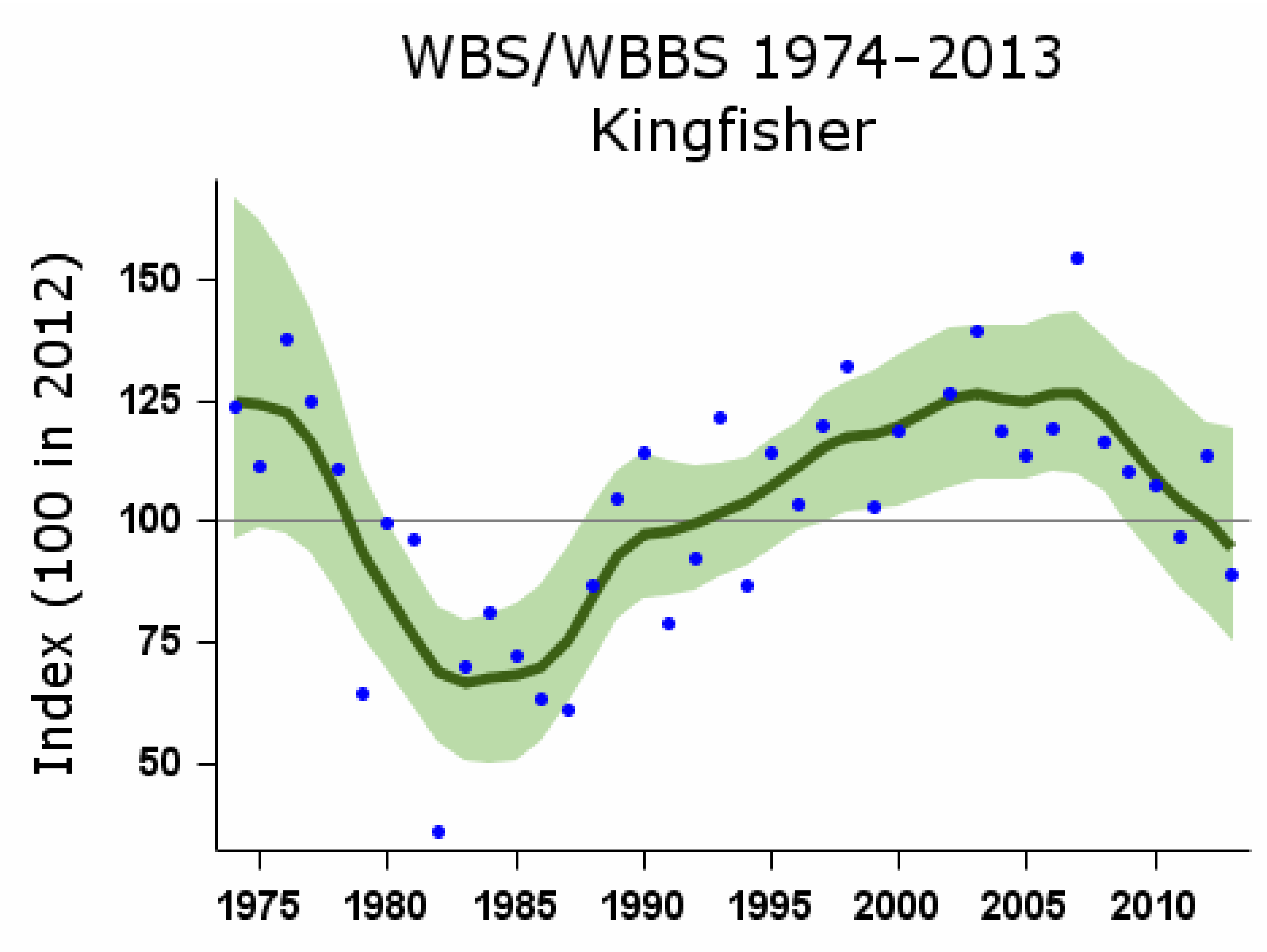
Alcedo atthis

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, only to enter another decline. The recent decline is raising BBS alerts, though numbers are much higher now than in the mid 1980s. The initial 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. It is likely, therefore, that winter weather is the main driver of population change. 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	37	1975-2012	55	-20	-48	20		
	25	1987-2012	67	32	-15	90		
	10	2002-2012	93	-20	-36	-2		
	5	2007-2012	77	-21	-34	-2		

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	17	1995-2012	54	-36	-53	-14	>25	
	10	2002-2012	61	-48	-63	-30	>25	
	5	2007-2012	59	-38	-48	-28	>25	
BBS England	17	1995-2012	48	-33	-50	-10	>25	
	10	2002-2012	54	-39	-53	-22	>25	
	5	2007-2012	55	-40	-50	-28	>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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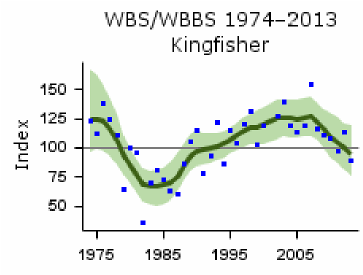
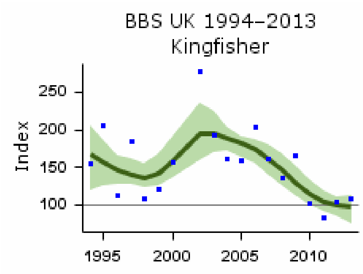
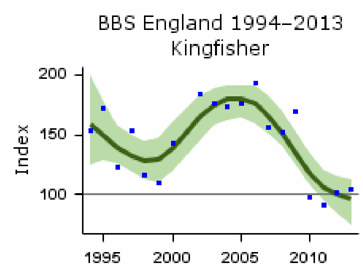


WBS/WBBS waterways graph



BBS UK graph



BBS England graph

Demographic trends

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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Green Woodpecker

Picus viridis

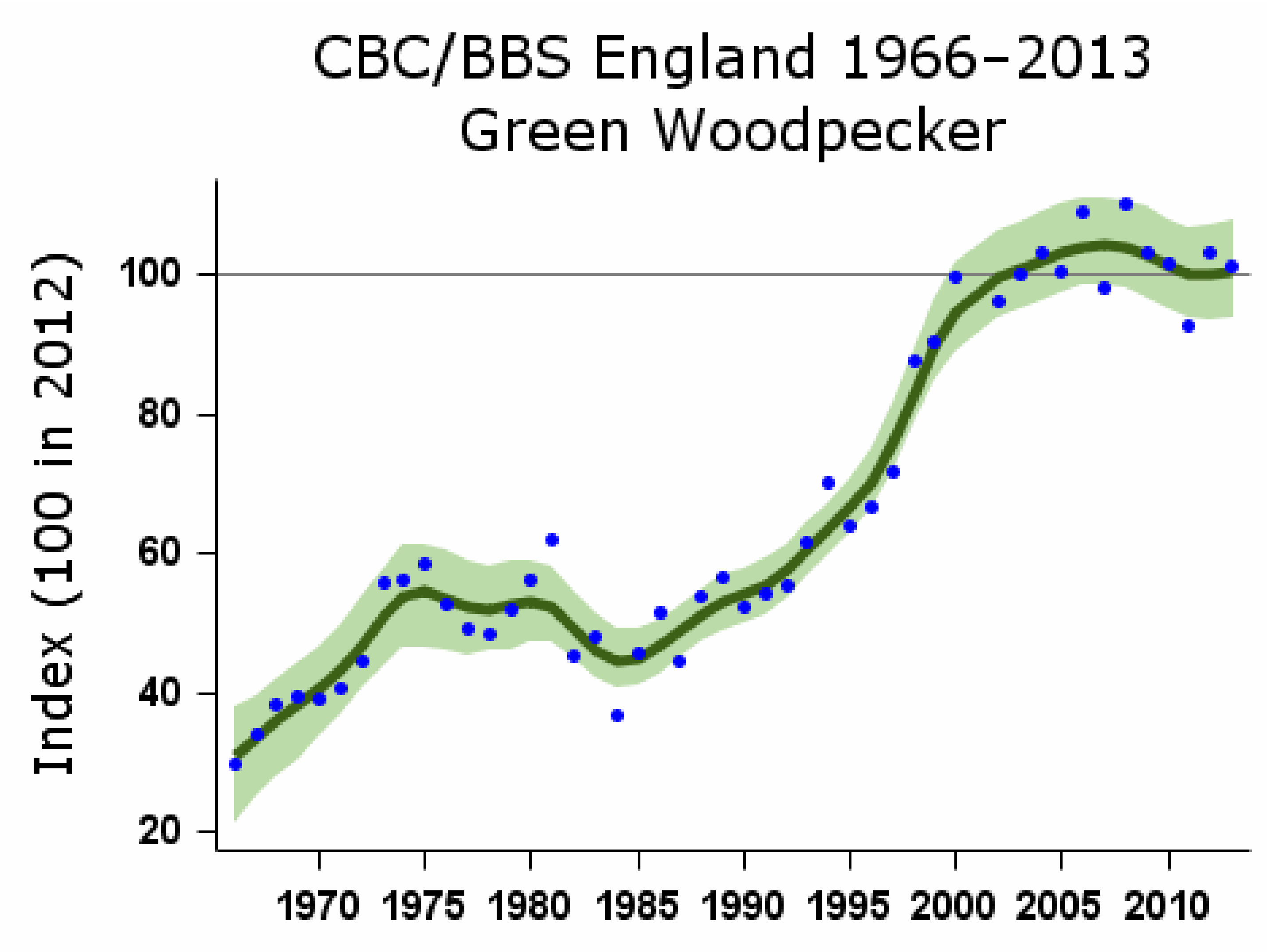
Key facts

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 atlas results indicate that expansion is continuing across England and Scotland, but not in Wales, where major retraction from some western regions was detected in 2008-11 (Balmer et al. 2013). Similarly, the BBS PECBMS 2014a).



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	45	1967-2012	355	198	134	332		
	25	1987-2012	587	105	77	144		
	10	2002-2012	903	0	-4	6		
	5	2007-2012	1016	-4	-8	-1		
BBS UK	17	1995-2012	826	38	30	49		
	10	2002-2012	961	0	-4	5		
	5	2007-2012	1074	-5	-9	-2		
BBS England	17	1995-2012	772	49	40	59		
	10	2002-2012	903	0	-3	6		
	5	2007-2012	1016	-4	-7	-1		
BBS Wales	17	1995-2012	47	-38	-56	-15	>25	
	10	2002-2012	51	-33	-59	-7	>25	
	5	2007-2012	51	-29	-43	-15	>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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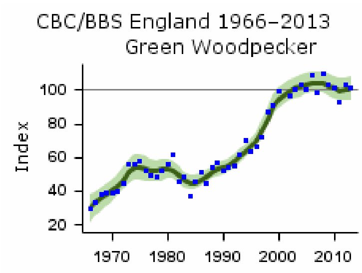
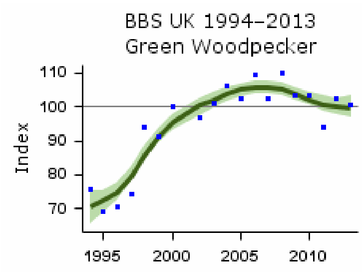
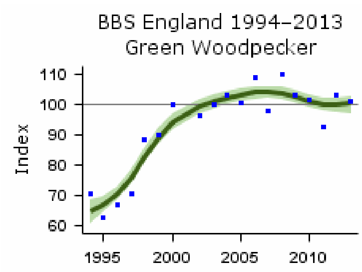


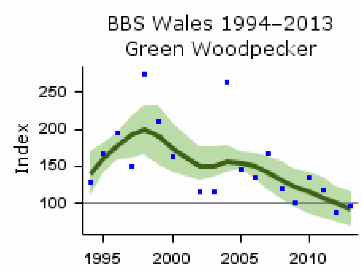
CBC/BBS England graph



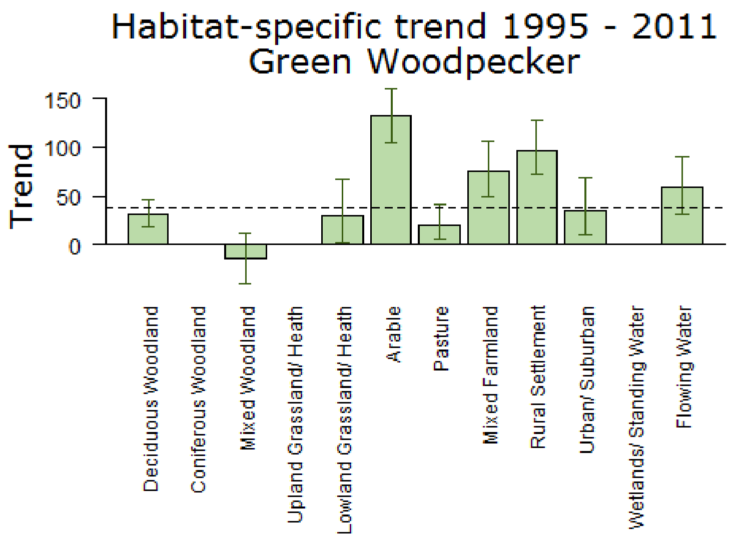
BBS UK graph



BBS England graph



Population trends by habitat



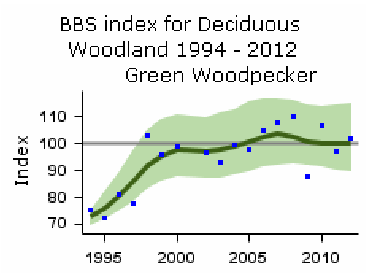
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

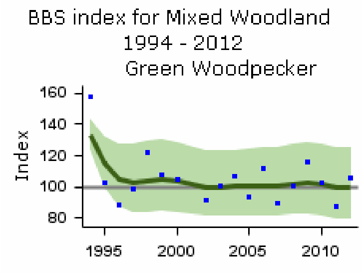
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	234	31	19	46
Mixed Woodland	16	1995-2011	112	-13	-39	13
Lowland Grassland/ Heath	16	1995-2011	38	31	2	67
Arable	16	1995-2011	173	133	105	160
Pasture	16	1995-2011	307	20	5	42
Mixed Farmland	16	1995-2011	144	76	50	107
Rural Settlement	16	1995-2011	179	97	72	128
Urban/ Suburban	16	1995-2011	76	35	10	69
Flowing Water	16	1995-2011	93	59	32	89

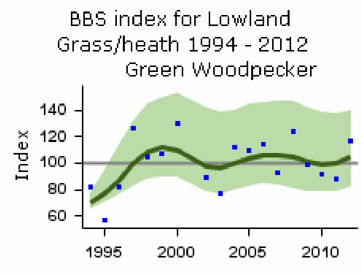
Further information on habitat-specific trends, please follow link here.



Habitat graph



Habitat graph



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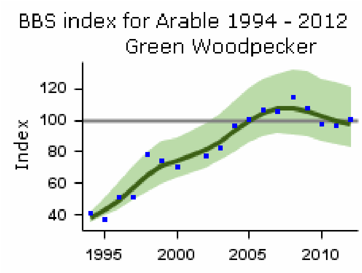

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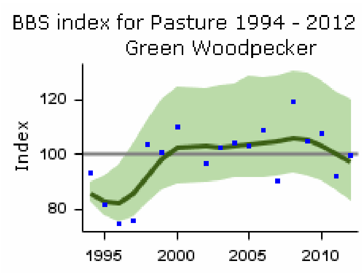

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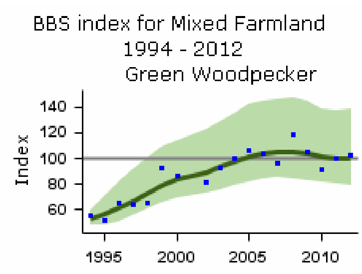

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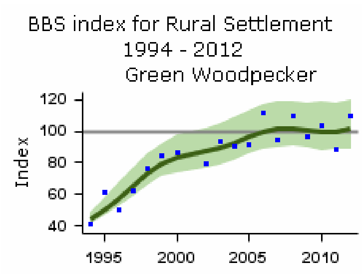

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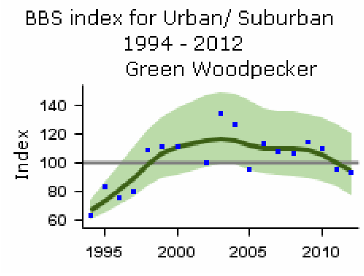
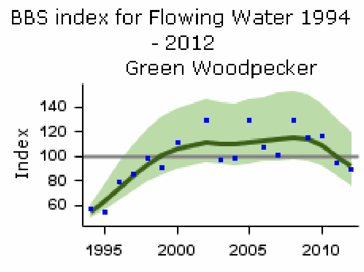


Habitat graph



Habitat 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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Great Spotted Woodpecker

Dendrocopos major

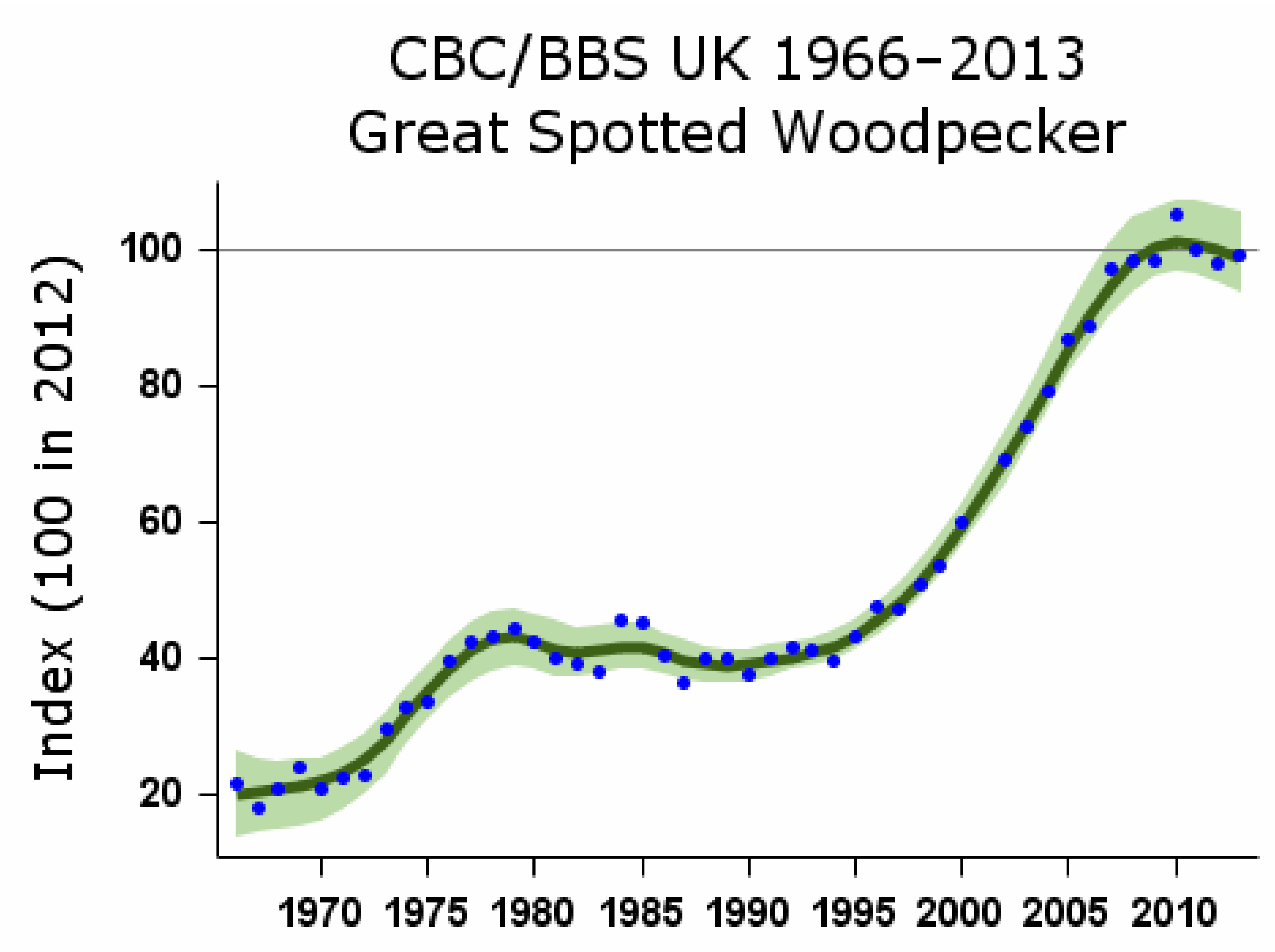
Key facts

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 mid 1990s. The BBS Balmer et al. 2013). Numbers have shown widespread moderate increase across Europe since 1980 (PECBMS 2014a).



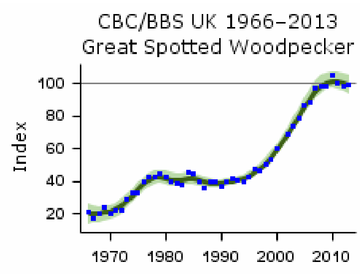
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

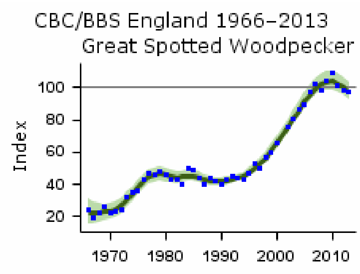
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	45	1967-2012	488	399	280	690		
	25	1987-2012	809	153	124	193		
	10	2002-2012	1325	45	38	52		
	5	2007-2012	1559	5	1	9		
CBC/BBS England	45	1967-2012	432	352	224	616		
	25	1987-2012	714	132	107	168		
	10	2002-2012	1158	32	26	39		
	5	2007-2012	1354	0	-3	4		
BBS UK	17	1995-2012	1077	139	125	153		
	10	2002-2012	1325	46	39	51		
	5	2007-2012	1559	6	2	10		
BBS England	17	1995-2012	946	116	105	130		
	10	2002-2012	1158	32	27	37		
	5	2007-2012	1354	1	-2	4		
BBS Scotland	17	1995-2012	50	369	253	507		
	10	2002-2012	67	114	71	165		
	5	2007-2012	91	28	11	52		
BBS Wales	17	1995-2012	79	193	119	275		
	10	2002-2012	97	68	46	104		
	5	2007-2012	111	11	-1	21		

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

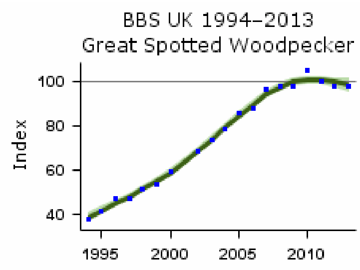
BTO JNCC rspb The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



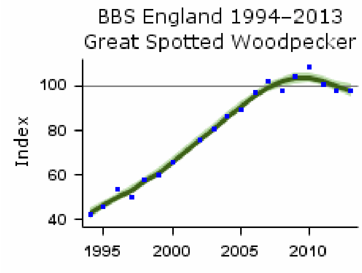
CBC/BBS UK graph



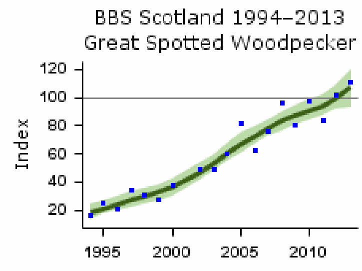
CBC/BBS England graph



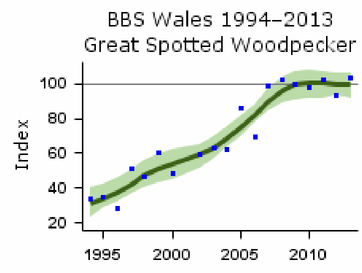
BBS UK graph



BBS England graph

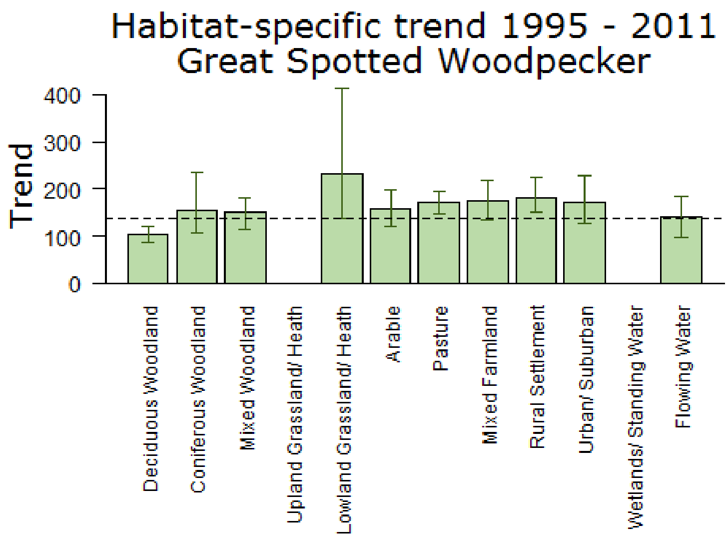


BBS Scotland graph



BBS Wales graph

Population trends by habitat



Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

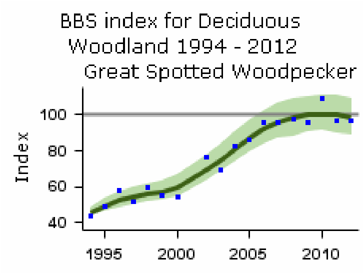
Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

More on habitat trends

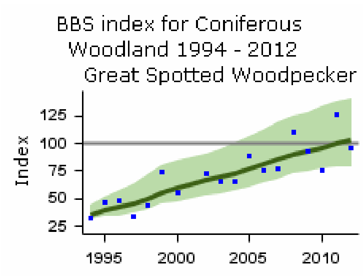
Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	332	103	85	119

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Coniferous Woodland	16	1995-2011	54	154	105	235
Mixed Woodland	16	1995-2011	175	151	115	183
Lowland Grassland/ Heath	16	1995-2011	32	232	136	413
Arable	16	1995-2011	194	156	121	196
Pasture	16	1995-2011	386	172	147	194
Mixed Farmland	16	1995-2011	145	173	135	219
Rural Settlement	16	1995-2011	211	182	151	225
Urban/ Suburban	16	1995-2011	91	172	126	227
Flowing Water	16	1995-2011	119	140	96	184

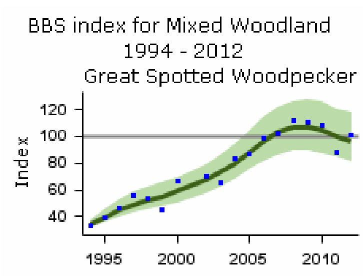
Further information on habitat-specific trends, please follow link here.



Habitat graph



Habitat graph



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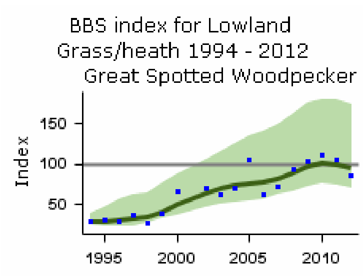

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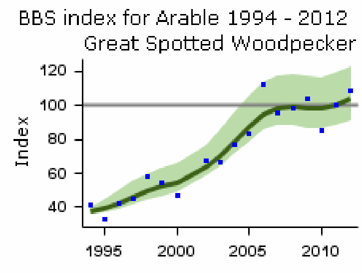
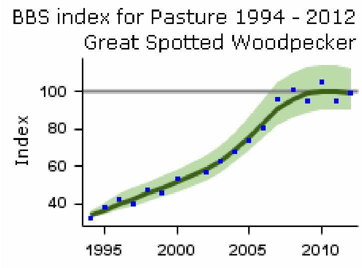


Habitat graph



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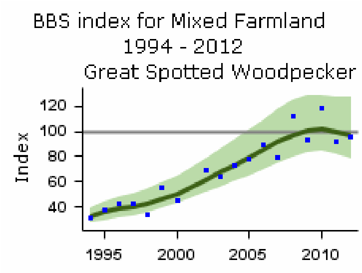
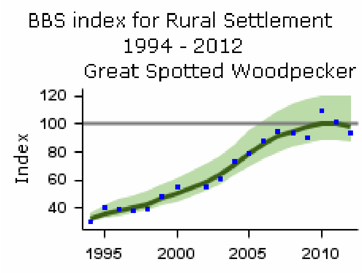
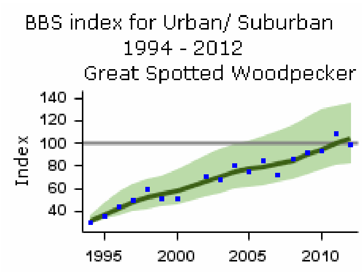


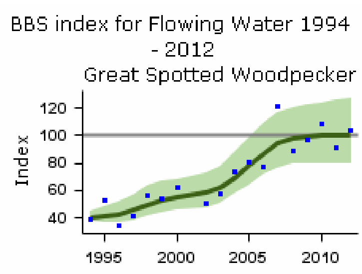
Habitat graph



Habitat graph

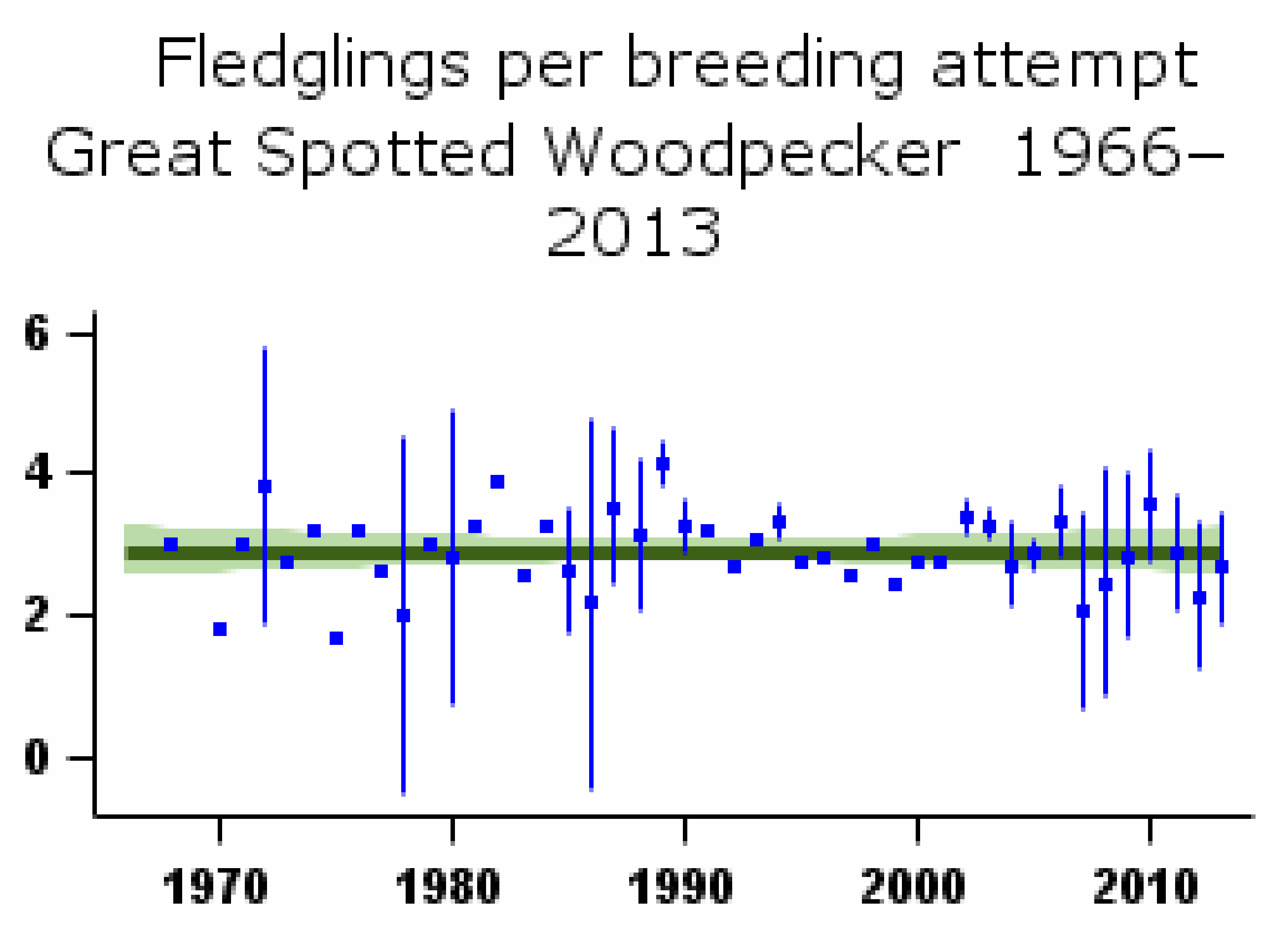


Habitat graph

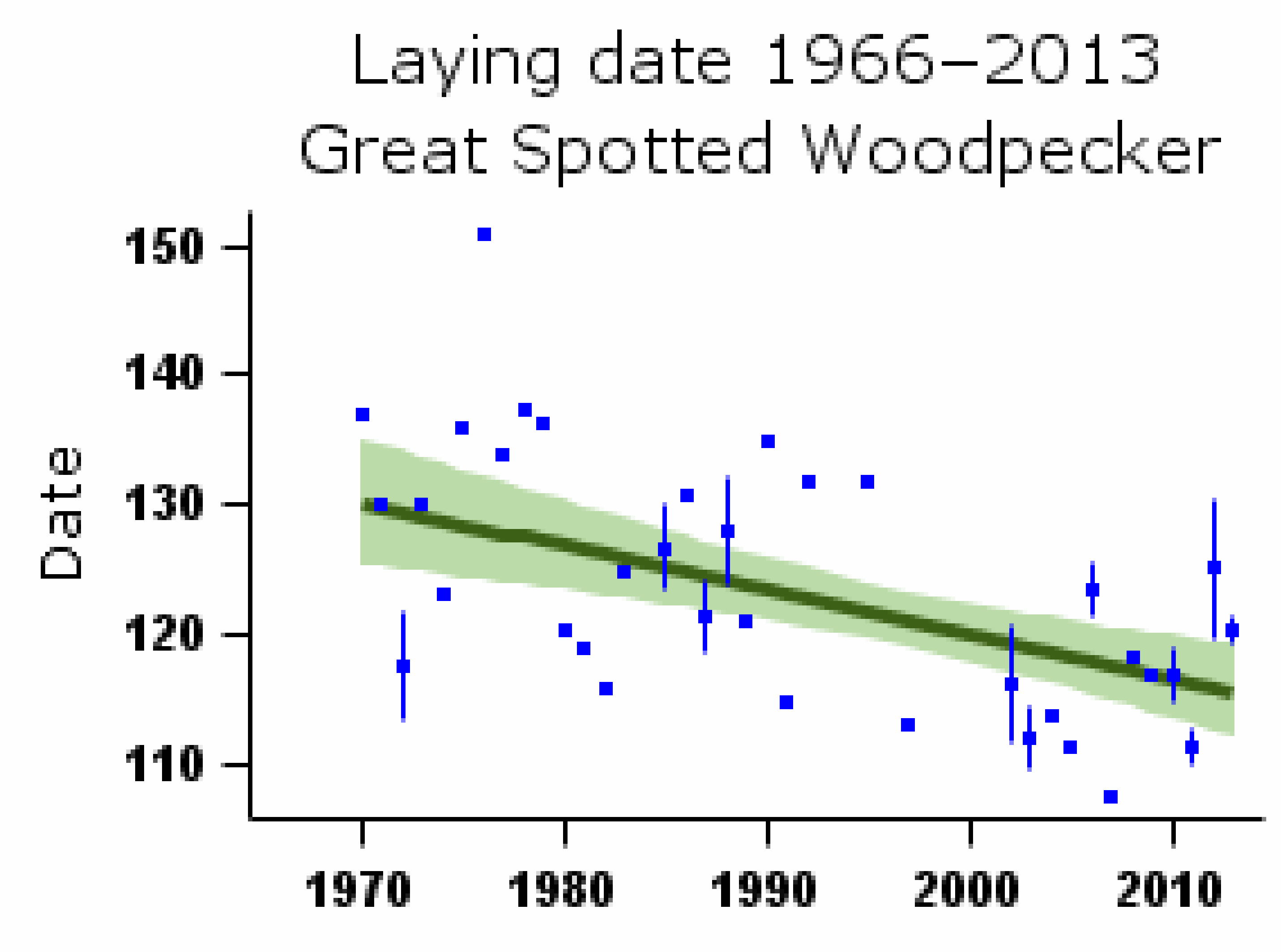


Habitat graph

Demographic trends



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

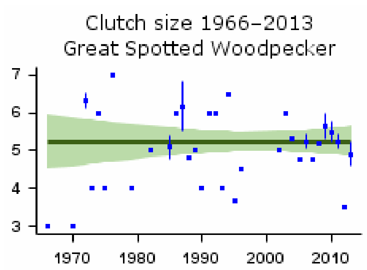


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

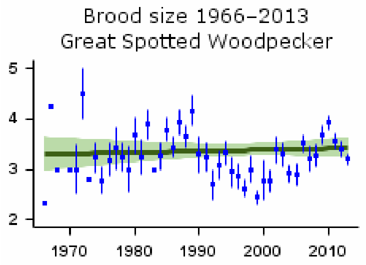
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	7	None					
Clutch size	44	1968-2012	4	None					Small sample
Brood size	44	1968-2012	22	None					Small sample
Nest failure rate at egg stage	44	1968-2012	7	None					Small sample
Nest failure rate at chick stage	44	1968-2012	24	None					Small sample
Laying date	44	1968-2012	4	Linear decline	May 11	Apr 26	-15 days		Small sample

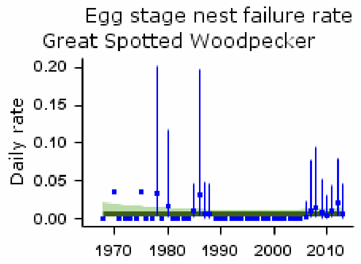
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



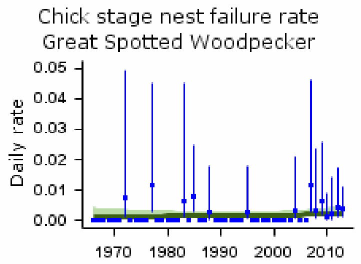
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



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 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. Use of garden feeders may be another of many factors contributing to their population increase.

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 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). Great Spotted Woodpeckers appear limited in their ability to advance their breeding period to maintain synchrony with their natural prey and thus their ready use of garden feeders has the potential to increase breeding success (Smith & Smith 2013).

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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Lesser Spotted Woodpecker

Dryobates minor

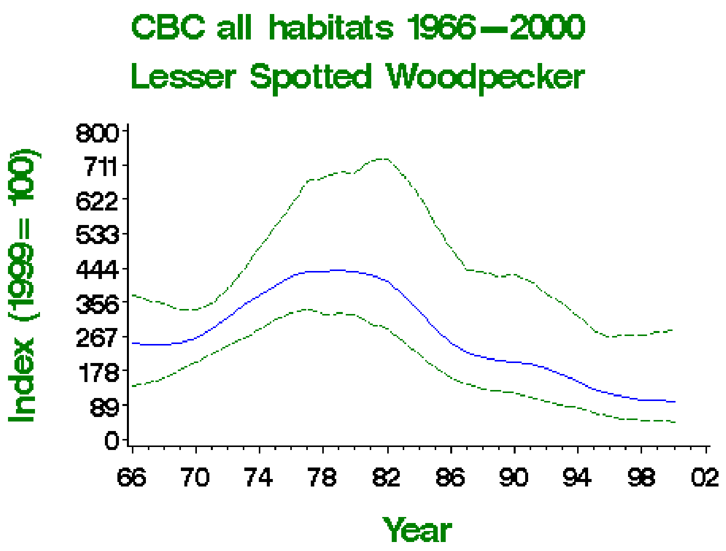
Key facts

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 (Balmeret al. 2013). 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, who have established PECBMS 2007): the European trend is described currently as 'uncertain' (PECBMS 2014a).



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 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).

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Kestrel

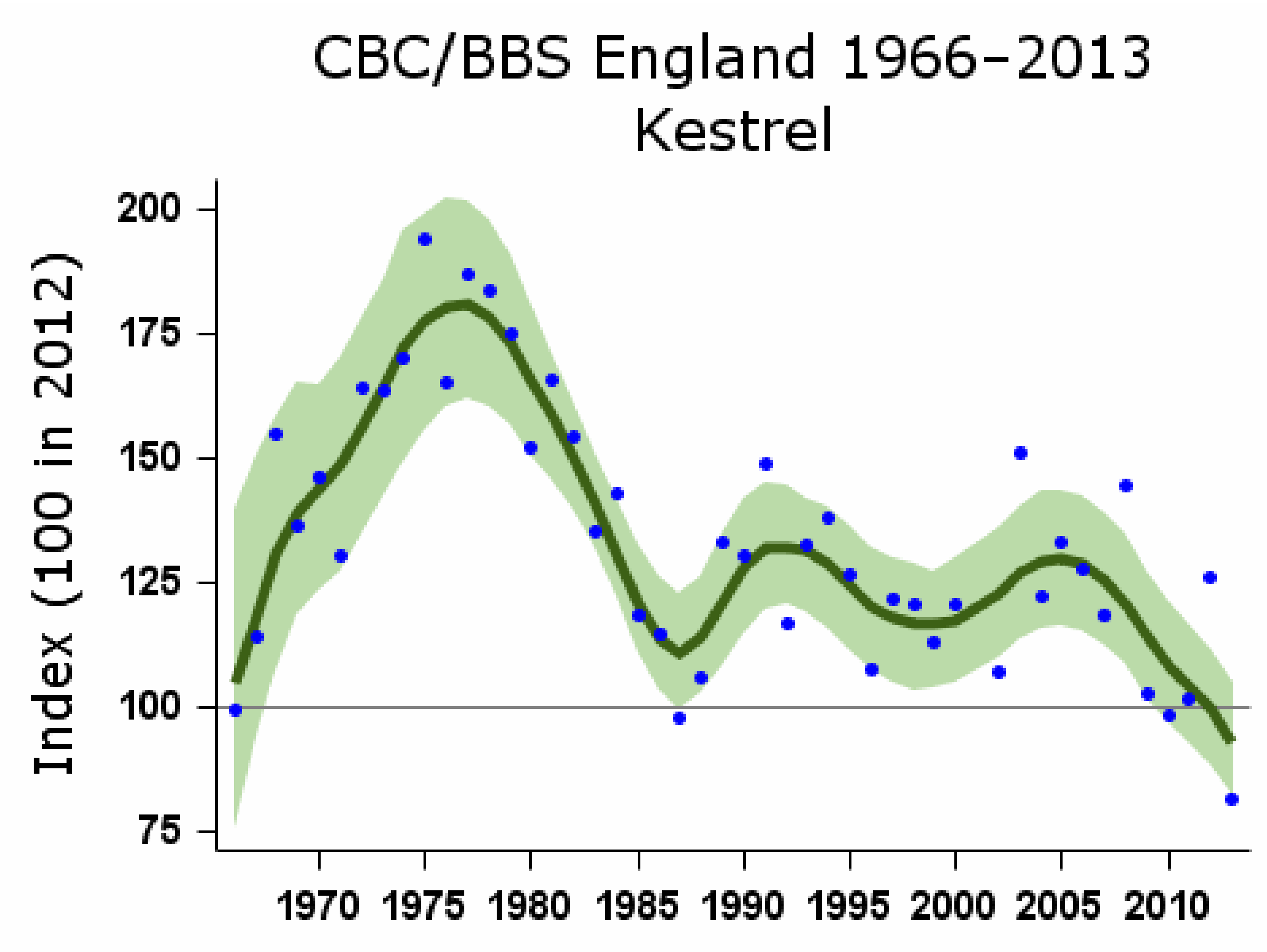
Falco tinnunculus

Key facts

Conservation listings:	Europe: SPEC category 3 (declining) (BiE04) UK: amber (25-50% population decline) (BoCC3)
Long-term trend:	England: shallow decline
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. Since the mid 1980s, the English population has fluctuated without a long-term trend being apparent but there are significant declines over the BBS period in England and especially in Scotland. 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 might have exceeded 50,000 pairs (Clements 2008). A moderate decrease has been recorded in the Republic of Ireland since 1998 (Crowe 2012). There has been widespread moderate decline across Europe since 1980 (PECBMS 2014a).



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

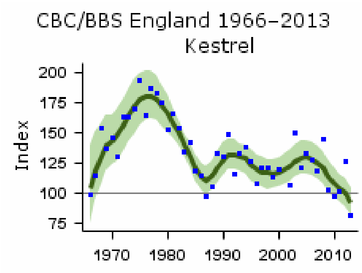
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	45	1967-2012	289	-16	-40	23		
	25	1987-2012	458	-10	-25	7		
	10	2002-2012	675	-18	-24	-12		
	5	2007-2012	754	-20	-24	-16		

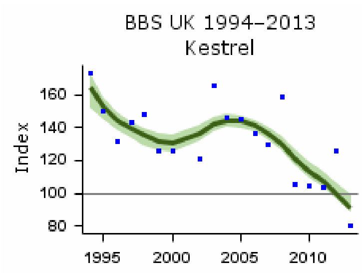
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	17	1995-2012	678	-35	-39	-28	>25	
	10	2002-2012	761	-27	-31	-19	>25	
	5	2007-2012	838	-27	-29	-21	>25	
BBS England	17	1995-2012	597	-21	-26	-13		
	10	2002-2012	675	-19	-24	-13		
	5	2007-2012	754	-20	-24	-16		
BBS Scotland	17	1995-2012	42	-65	-75	-50	>50	
	10	2002-2012	44	-54	-68	-32	>50	
	5	2007-2012	44	-49	-62	-32	>25	

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

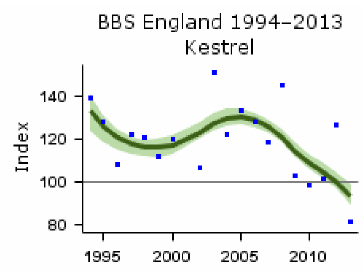
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



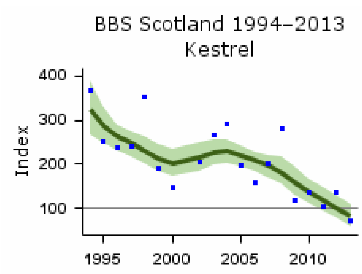
CBC/BBS England graph



BBS UK graph

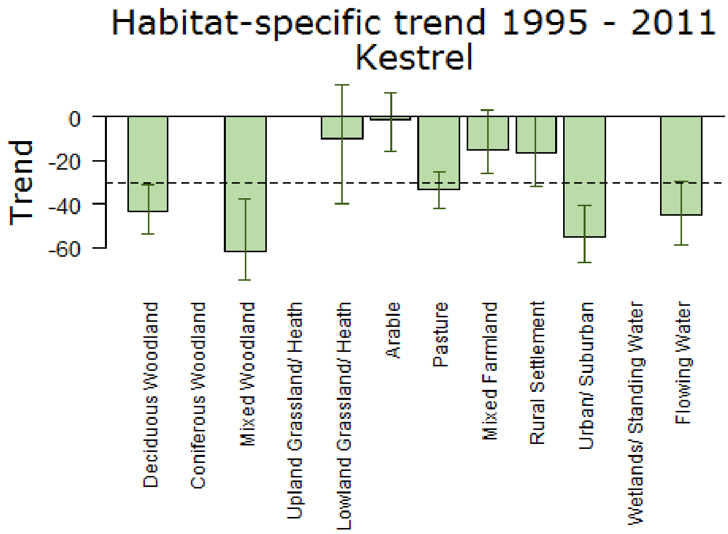


BBS England graph



BBS Scotland graph

Population trends by habitat



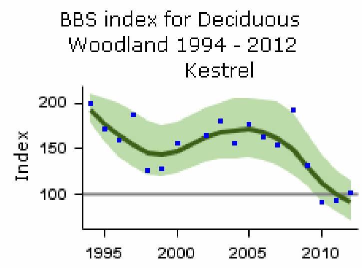
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

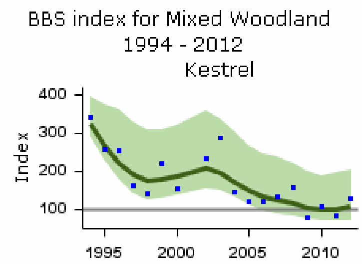
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	89	-44	-54	-31
Mixed Woodland	16	1995-2011	38	-62	-75	-38
Lowland Grassland/ Heath	16	1995-2011	39	-10	-40	15
Arable	16	1995-2011	144	-2	-16	11
Pasture	16	1995-2011	225	-33	-42	-25
Mixed Farmland	16	1995-2011	110	-15	-26	3
Rural Settlement	16	1995-2011	109	-17	-32	0
Urban/ Suburban	16	1995-2011	44	-55	-67	-41
Flowing Water	16	1995-2011	63	-45	-59	-30

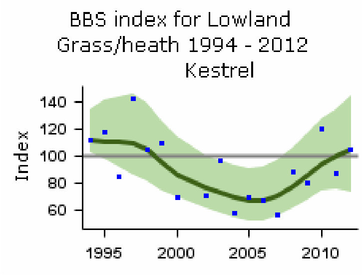
Further information on habitat-specific trends, please follow link here.



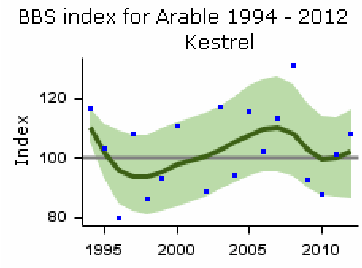
Habitat graph



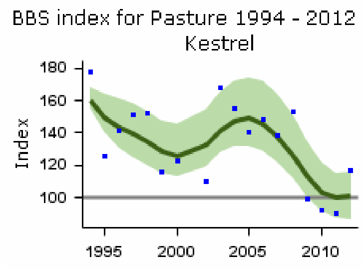
Habitat graph



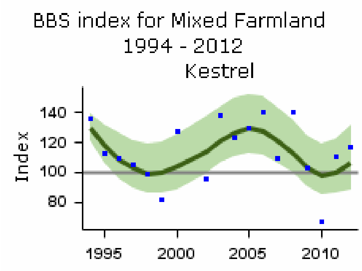
Habitat graph



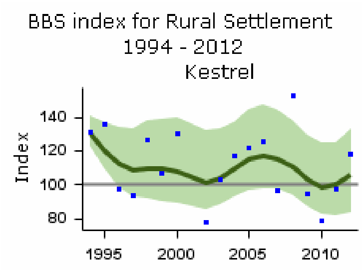
Habitat graph



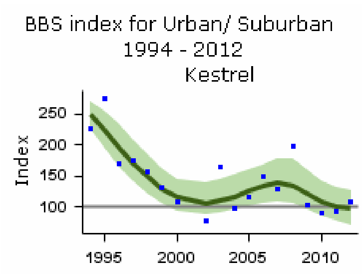
Habitat graph



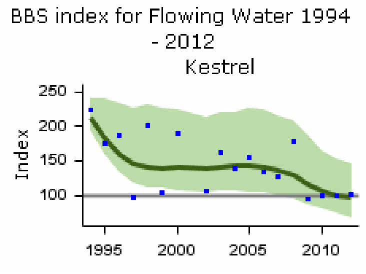
Habitat graph



Habitat graph

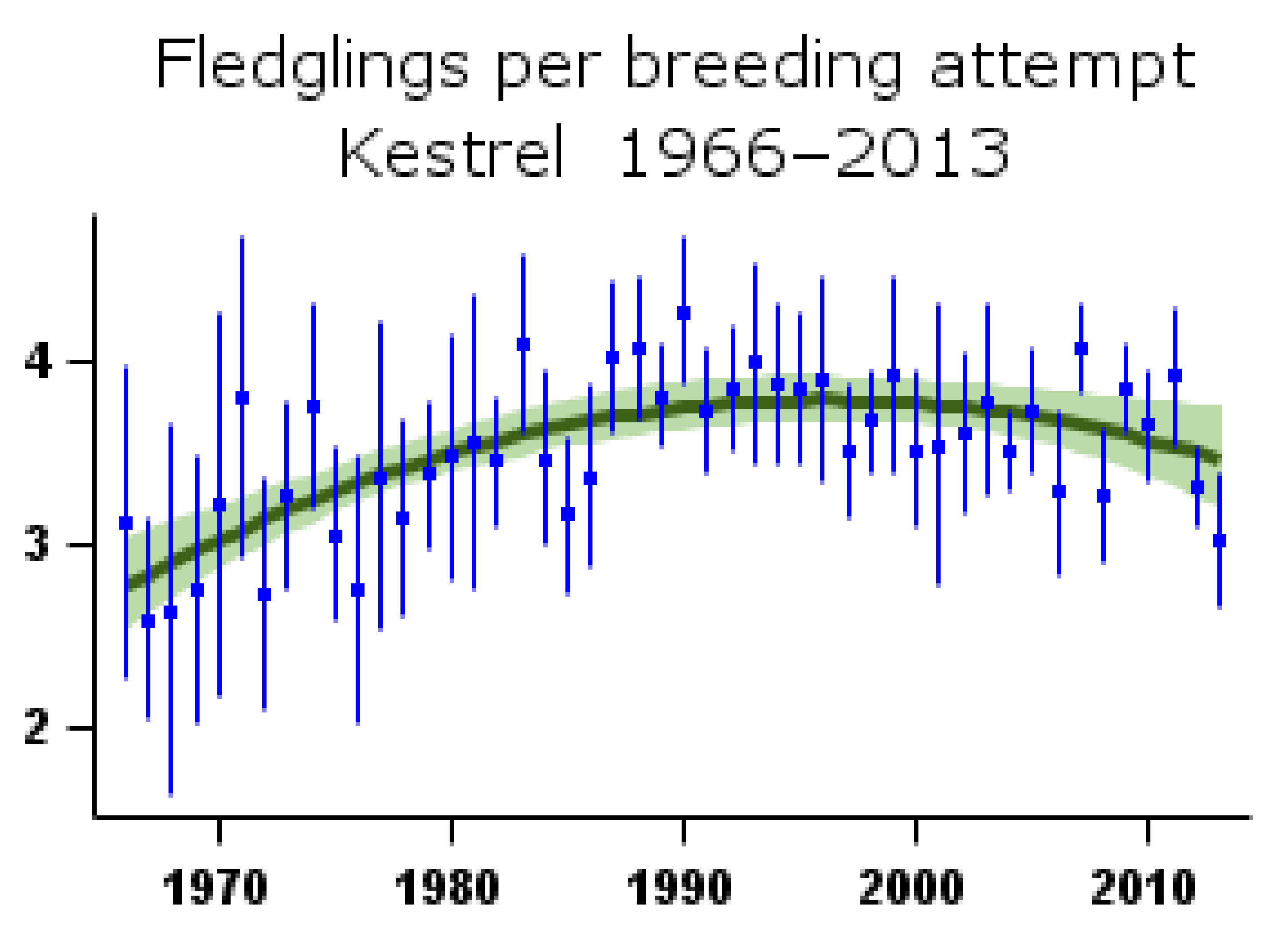


Habitat graph

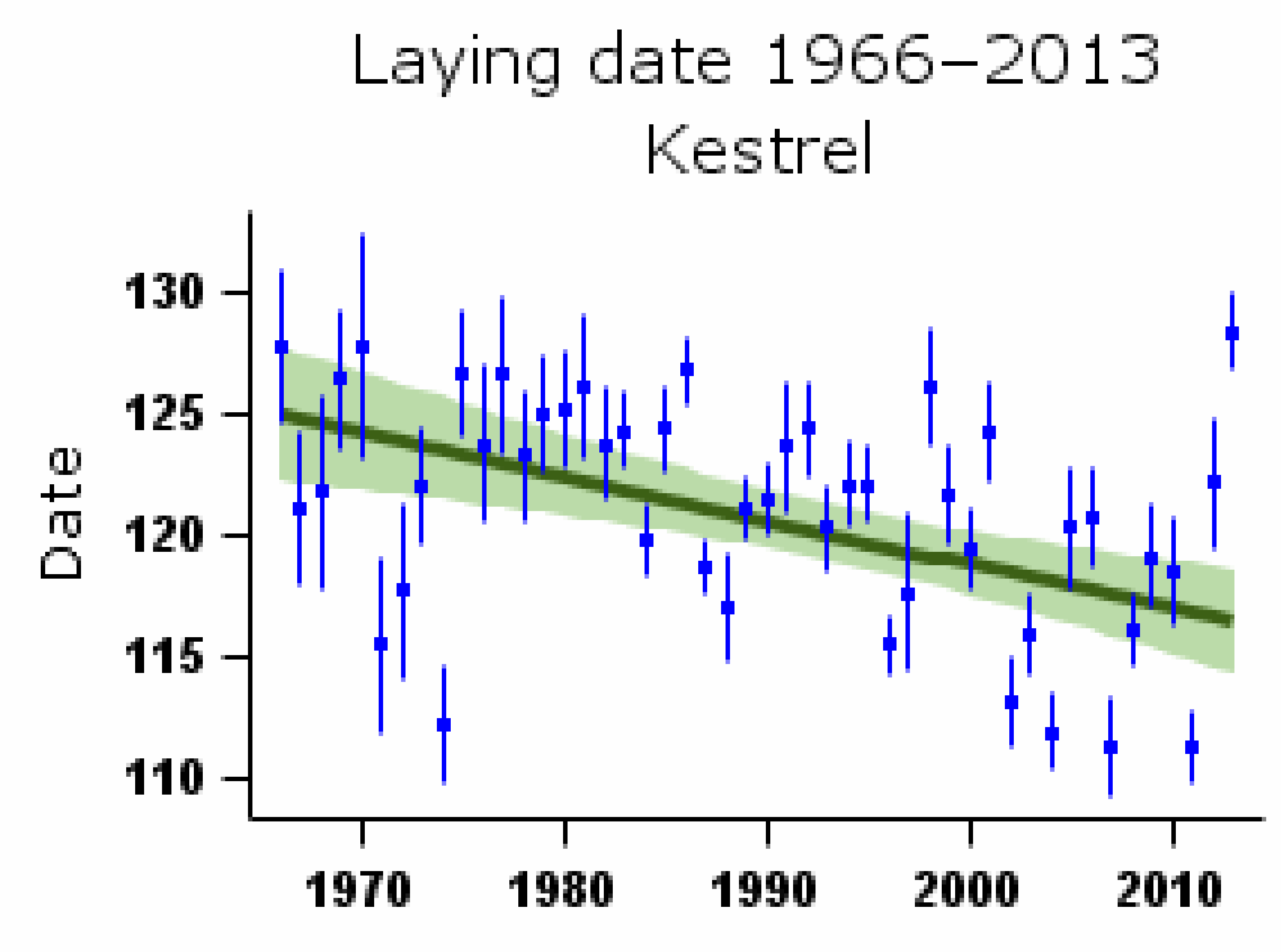


Habitat graph

Demographic trends



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

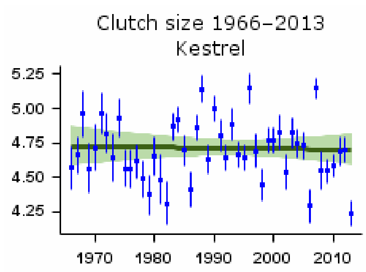


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

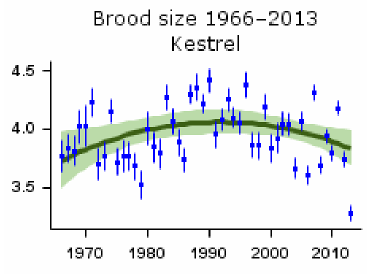
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	41	Curvilinear	2.91 fledglings	3.51 fledglings	20.7%		
Clutch size	44	1968-2012	60	None					
Brood size	44	1968-2012	150	Curvilinear	3.78 chicks	3.86 chicks	2.0%		
Nest failure rate at egg stage	44	1968-2012	41	Curvilinear	0.73% nests/day	0.12% nests/day	-83.6%		
Nest failure rate at chick stage	44	1968-2012	71	None					
Laying date	44	1968-2012	23	Linear decline	May 5	Apr 27	-8 days		Small sample

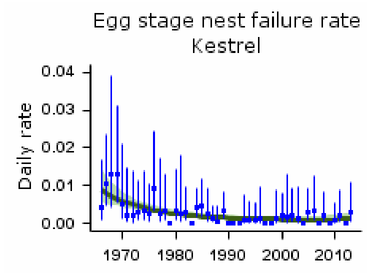
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



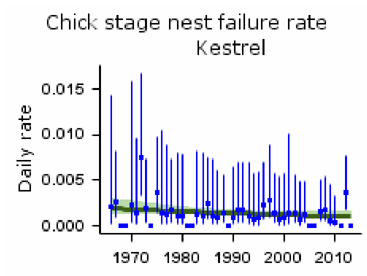
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



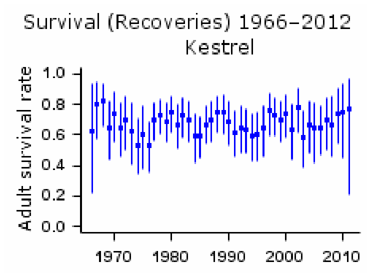
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



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



Proportion of adult birds surviving to following year based on dead recoveries of ringed birds - error bars represent 95% confidence limits

Causes of change

At present, the link between potential factors and the population trend of Kestrels has not been established and new research is needed. In the meantime, landowners keen to offer suitable Kestrel habitat should provide grassy cover for small mammals.

Change factor	Primary driver	Secondary driver
Demographic	Reduced survival	
Ecological	Unknown	

Further information on causes of change

The main period of decline in Britain occurred from the mid 1970s to the late 1980s and it has been linked to the effects of agricultural intensification on farmland habitats and their populations of small mammals (Gibbons et al. 1993), but it is interesting to notice that the number of nestlings fledged per breeding attempt had not declined, suggesting that, in areas retaining Kestrels, small mammals were not limiting fledging success. Integrated analyses suggest that changes in first-year and, particularly, adult survival are the primary contributors to population change (Robinson et al. 2014).

Kestrels hunt a variety of prey, including voles, in particular in farmland settings (Shrubb 1993). Field voles Microtus agrestis favour habitats that can provide dense, grassy cover and a thick litter layer (Hansson 1977). Their population fluctuates in four-year cycles and it has been suggested that this might affect Kestrels that do not switch to other prey such as other small mammals, birds and insects (Shrubb 1993). There is no evidence, however, that Kestrels in the UK fluctuate alongside vole numbers. There is also, at present, no evidence that availability of nest sites limit population size of this raptor. A study over 23 years in a coniferous forest in northern England found a negative relationship between the numbers of Kestrels and Goshawks Accipiter gentilis, and remains of the smaller species near Goshawk nests (Petty et al. 2003). The impact of this larger raptor on population trend of Kestrels is not clear at the national level; however, it may be a factor at a local scale and more studies should focus on predation on Kestrels by other raptors.

Species high in the food chain are at risk of secondary poisoning, and birds of prey feeding on rodents are particularly vulnerable to anticoagulant rodenticides, but these are not the main cause of mortality of Kestrel in the UK (Walker et al. 2013) nor abroad (Christensen et al. 2012). A study on causes of death in raptors showed that the majority of Kestrels had died from collision and starvation (Newton et al. 1999). Carcasses reported for toxicology might be biased towards certain circumstances of death (eg collisions with vehicles) and could therefore underestimate the impact of rodenticides on Kestrel and other birds of prey. Targeted studies should be carried out, ideally to collect samples from live birds as well as dead ones.

Declining population of Kestrel is likely to be due to multiple factors. Changes in agricultural practice have reduced the habitat for its prey species, such as voles (although population trends of small mammals are not easy to establish (Flowerdew et al. 2004, Macdonald et al. 2007). Small rodents are abundant in road verges which provide suitable habitat for these mammals (Bellamy et al. 2000). In turn, Kestrel may be drawn to hunting along roads with increased risks of collision with passing vehicles, although there is no evidence for this at present. More research is needed to establish links between potential factors and Kestrel population change. In the meantime, landowners keen to offer suitable Kestrel habitat should provide grassy cover for small mammals.

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

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)

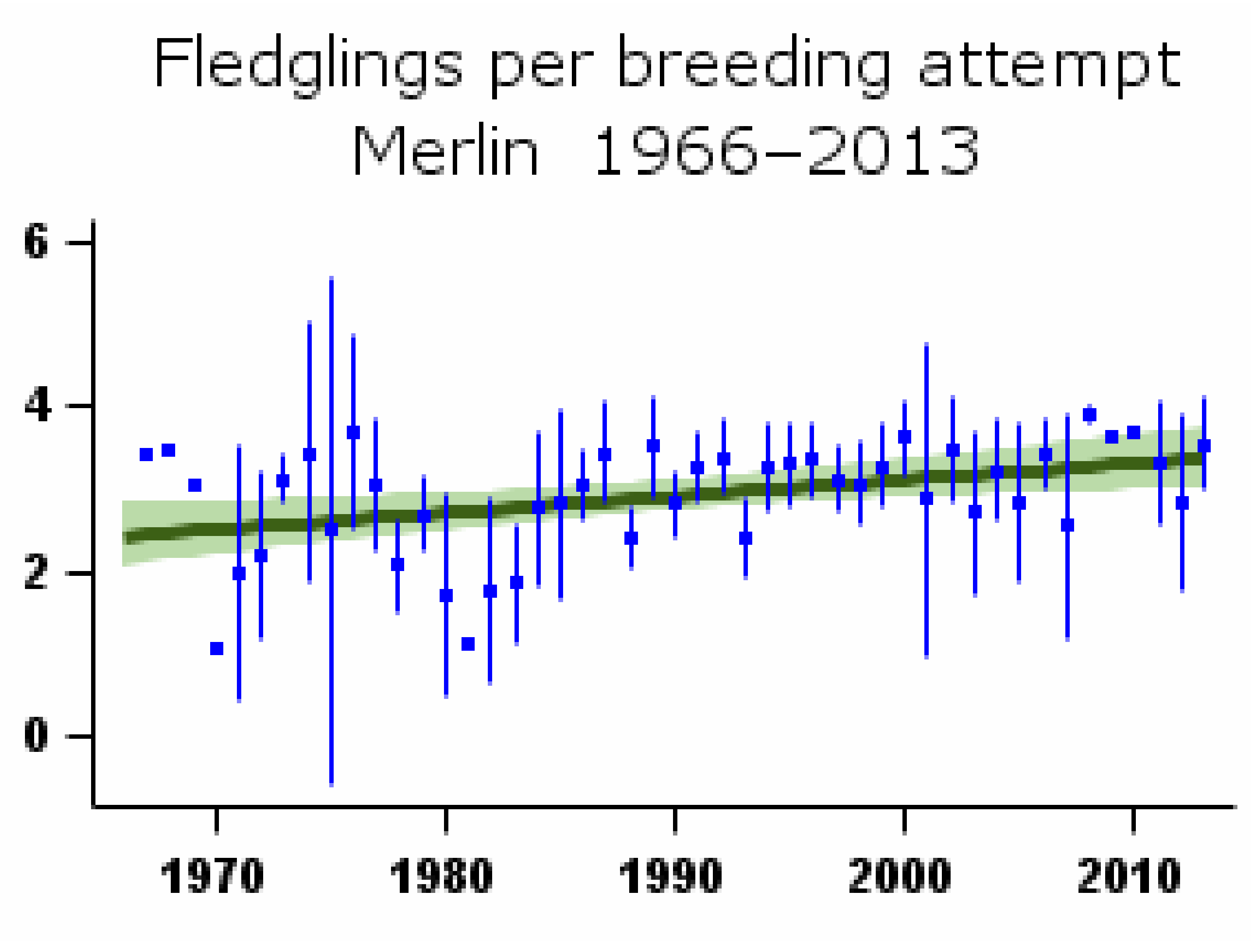
Status summary

Having declined substantially over the past two centuries, Merlin shows indications of a recent doubling of UK 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, Newton 2013). 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).

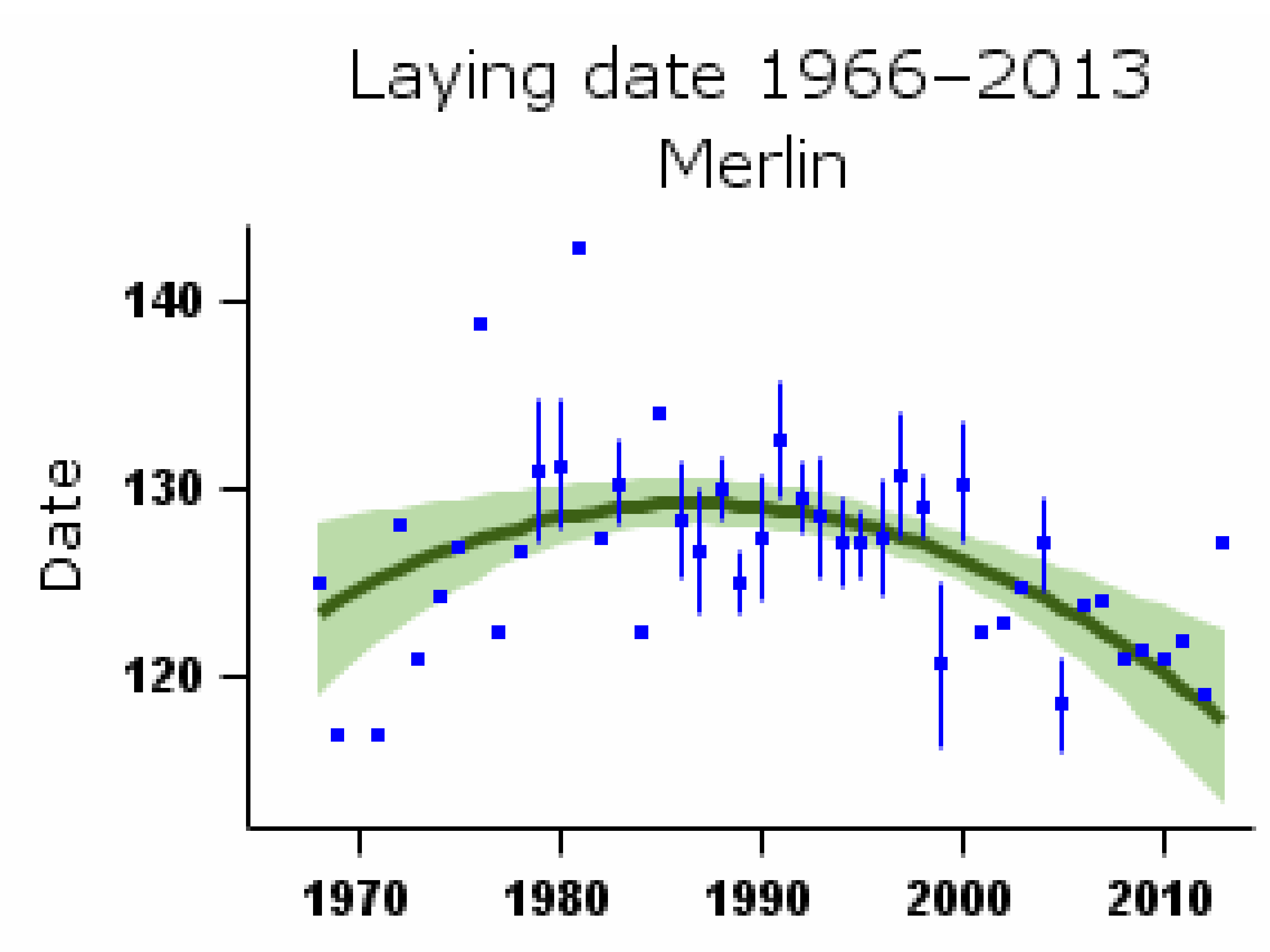
Population changes in detail

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

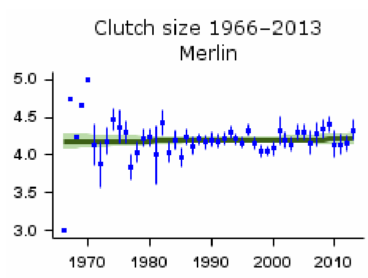


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

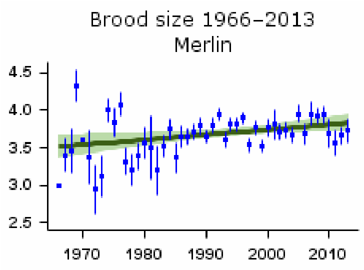
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	21	Linear increase	2.47 fledglings	3.35 fledglings	35.4%		
Clutch size	44	1968-2012	36	None					
Brood size	44	1968-2012	55	Linear increase	3.53 chicks	3.82 chicks	8.4%		
Nest failure rate at egg stage	44	1968-2012	23	Linear decline	0.69% nests/day	0.17% nests/day	-75.4%		Small sample
Nest failure rate at chick stage	44	1968-2012	28	Linear decline	0.83% nests/day	0.24% nests/day	-71.1%		Small sample
Laying date	44	1968-2012	8	Curvilinear	May 3	Apr 29	-4 days		Small sample

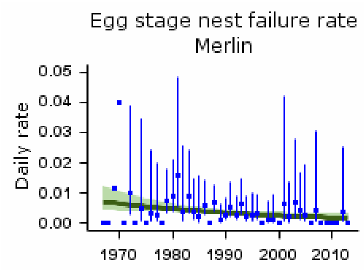
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



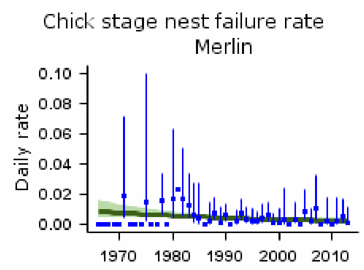
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



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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Hobby

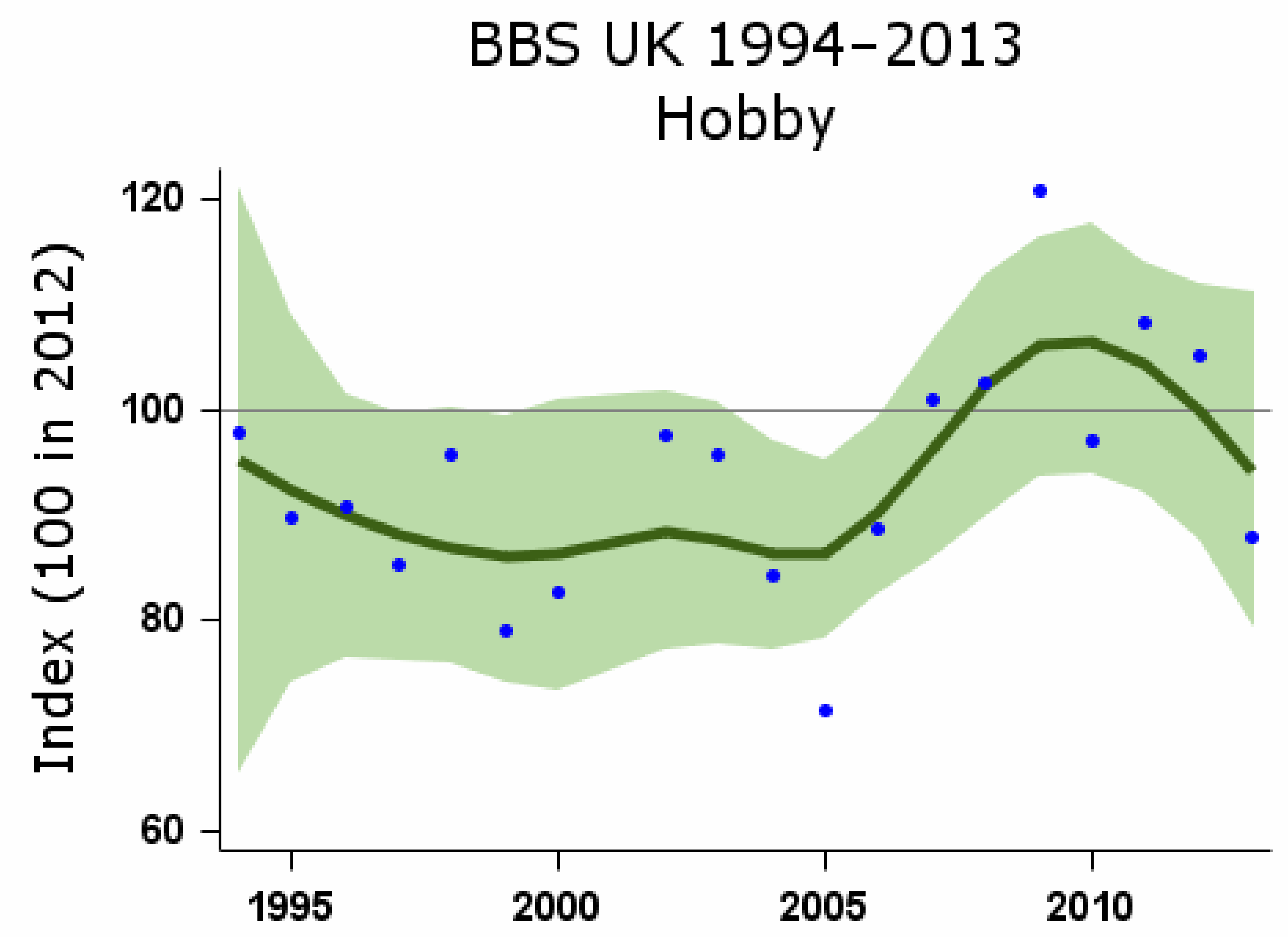
Falco subbuteo

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 for wide-scale monitoring 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 2014). RBBP guidelines for recording this species are 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). The species is now widespread north to Lancashire and Co Durham (Balmer et al. 2013). 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

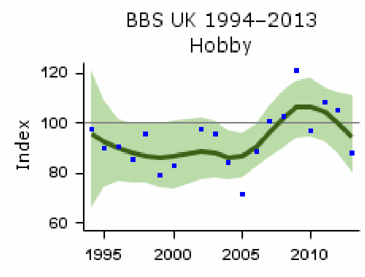
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	17	1995-2012	43	8	-22	49		
	10	2002-2012	51	13	-11	51		

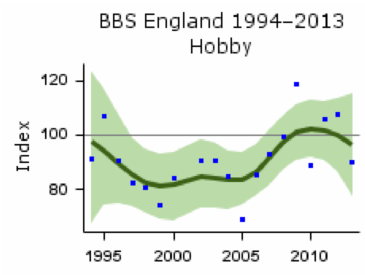
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	5	2007-2012	91	4	-13	20		
BBS England	17	1995-2012	42	6	-27	52		
	10	2002-2012	50	18	-13	50		
	5	2007-2012	59	9	-12	30		

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

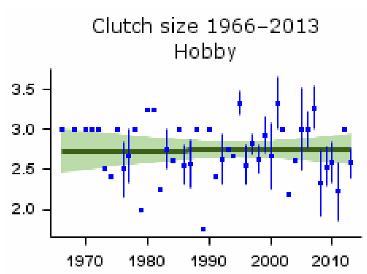


BBS England graph

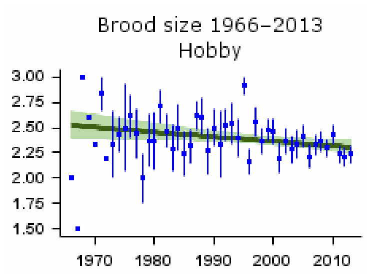
Demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Clutch size	44	1968-2012	6	None					Small sample
Brood size	44	1968-2012	25	Linear decline	2.51 chicks	2.31 chicks	-8.1%		Small sample
Nest failure rate at chick stage	44	1968-2012	15	None					Small sample

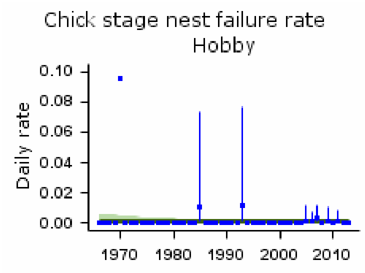
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



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



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Peregrine

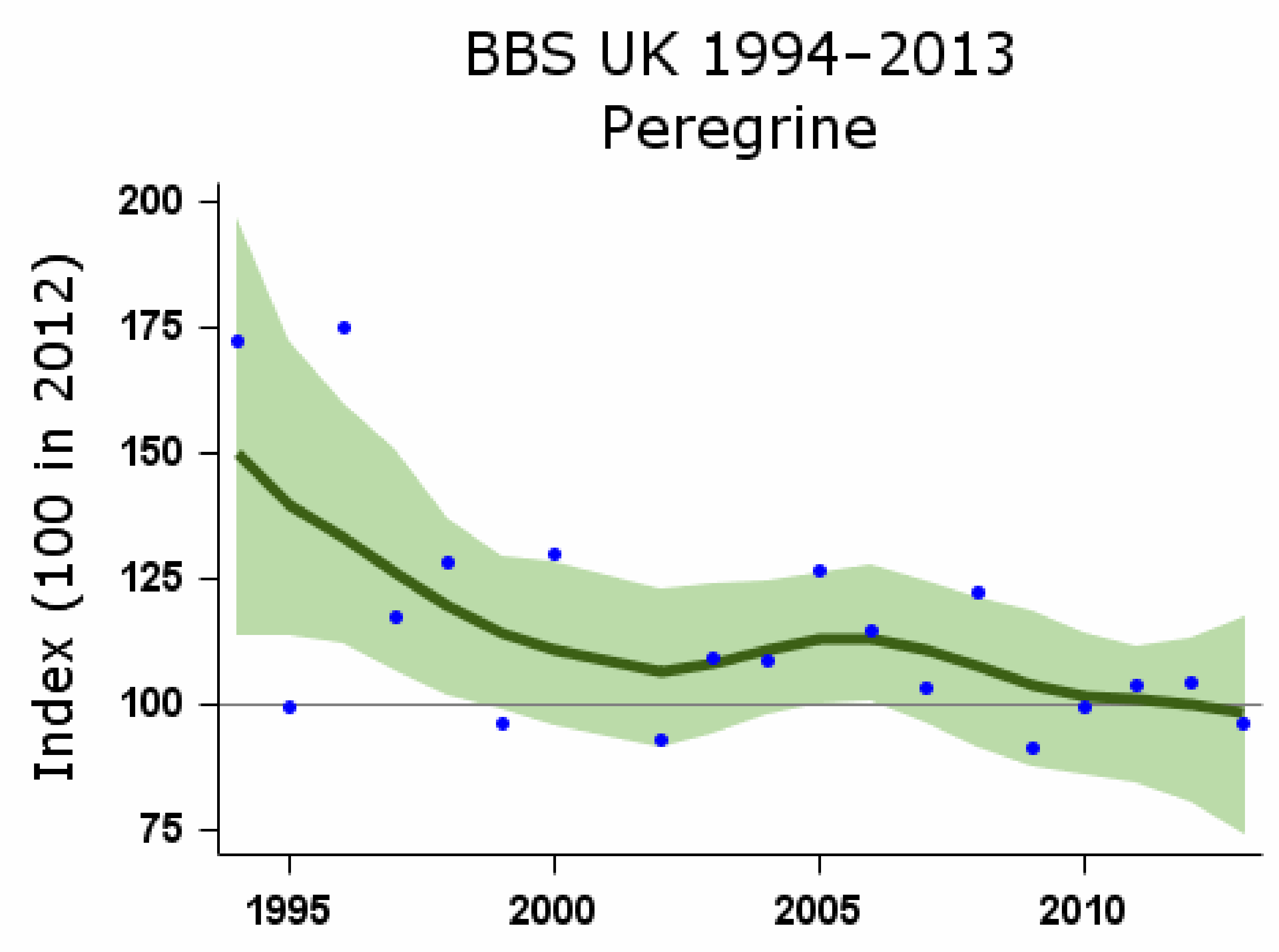
Falco peregrinus

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 (Newton 2013). 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 rise 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 Amar et al. 2012). The number of UK breeding pairs has been censused every decade 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. Results are awaited from a new national BTO Peregrine Survey conducted in spring 2014.



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

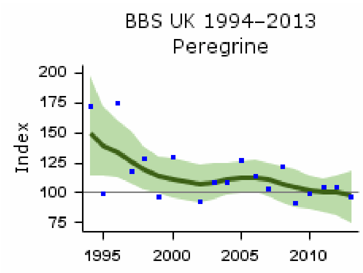
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	17	1995-2012	47	-28	-51	3		
	10	2002-2012	56	-6	-30	21		

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	5	2007-2012	68	-10	-29	11		

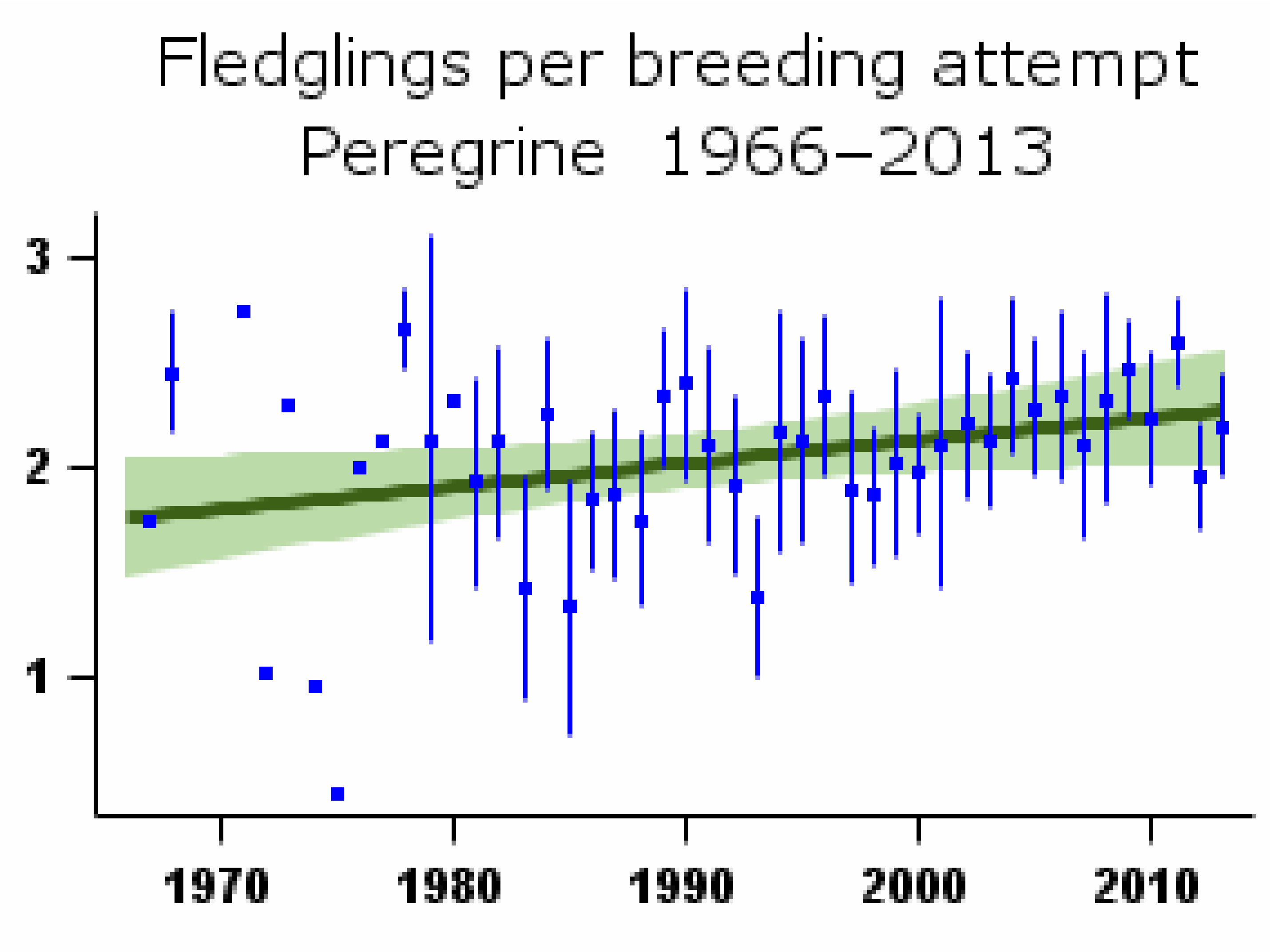
Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

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

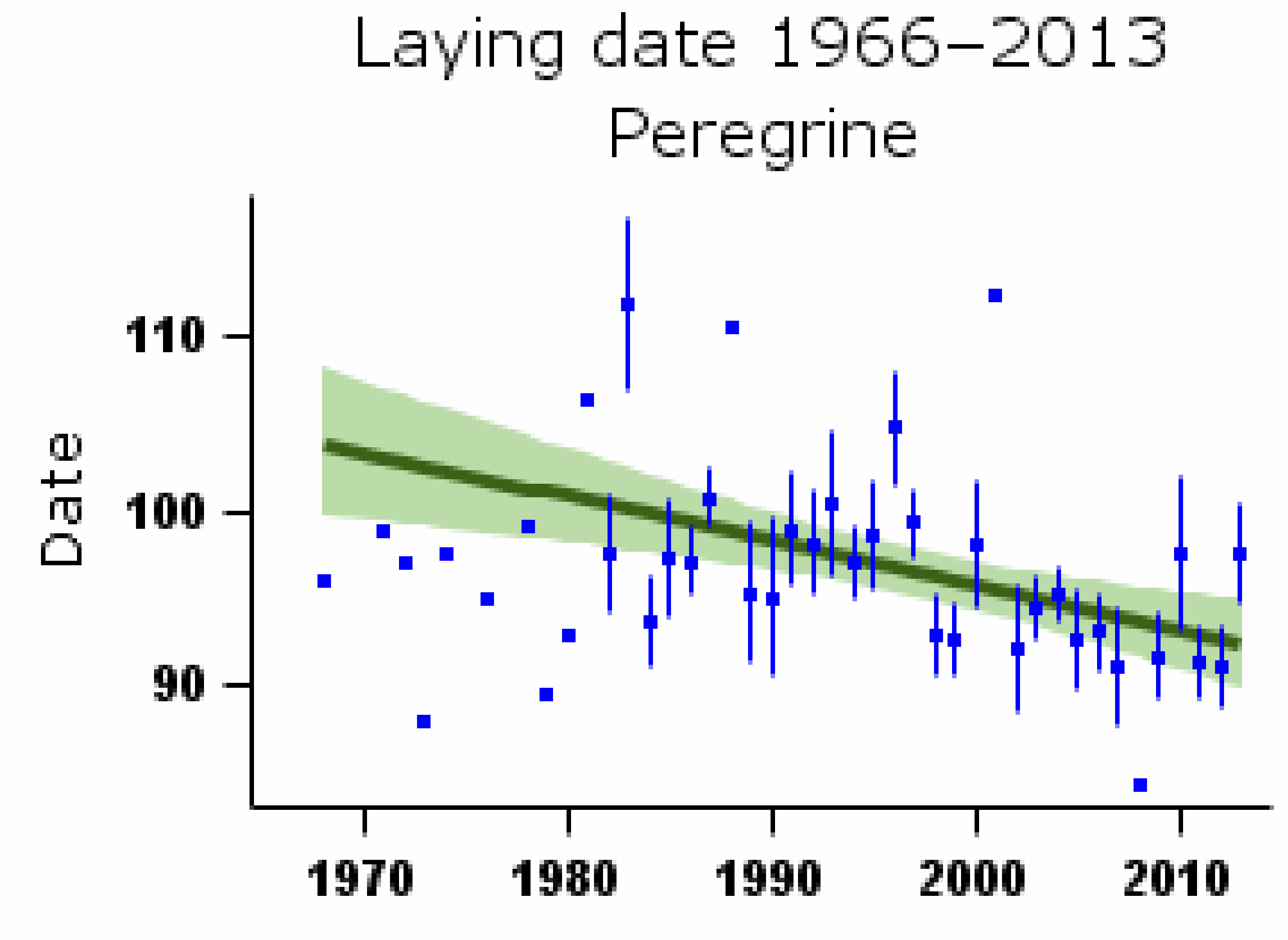


BBS UK graph

Demographic trends



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

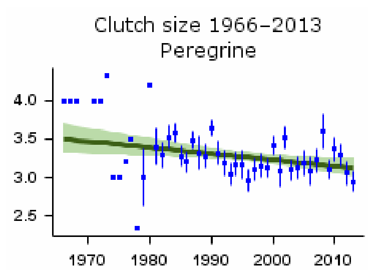


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

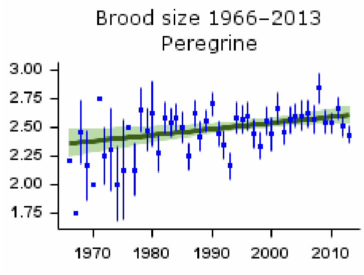
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	23	Linear increase	1.78 fledglings	2.26 fledglings	27.0%		
Clutch size	44	1968-2012	18	Linear decline	3.49 eggs	3.13 eggs	-10.2%		Small sample
Brood size	44	1968-2012	48	Linear increase	2.37 chicks	2.60 chicks	9.9%		
Nest failure rate at egg stage	44	1968-2012	24	Linear decline	0.69% nests/day	0.29% nests/day	-58.0%		Small sample
Nest failure rate at chick stage	44	1968-2012	27	None					Small sample
Laying date	44	1968-2012	11	Linear decline	Apr 14	Apr 3	-11 days		Small sample

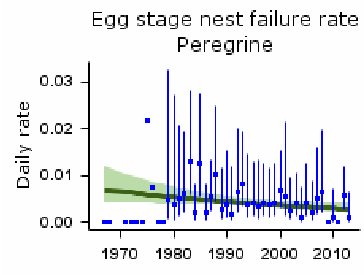
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



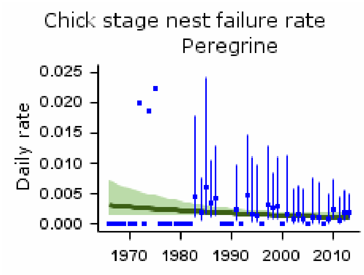
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



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

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This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Ring-necked Parakeet

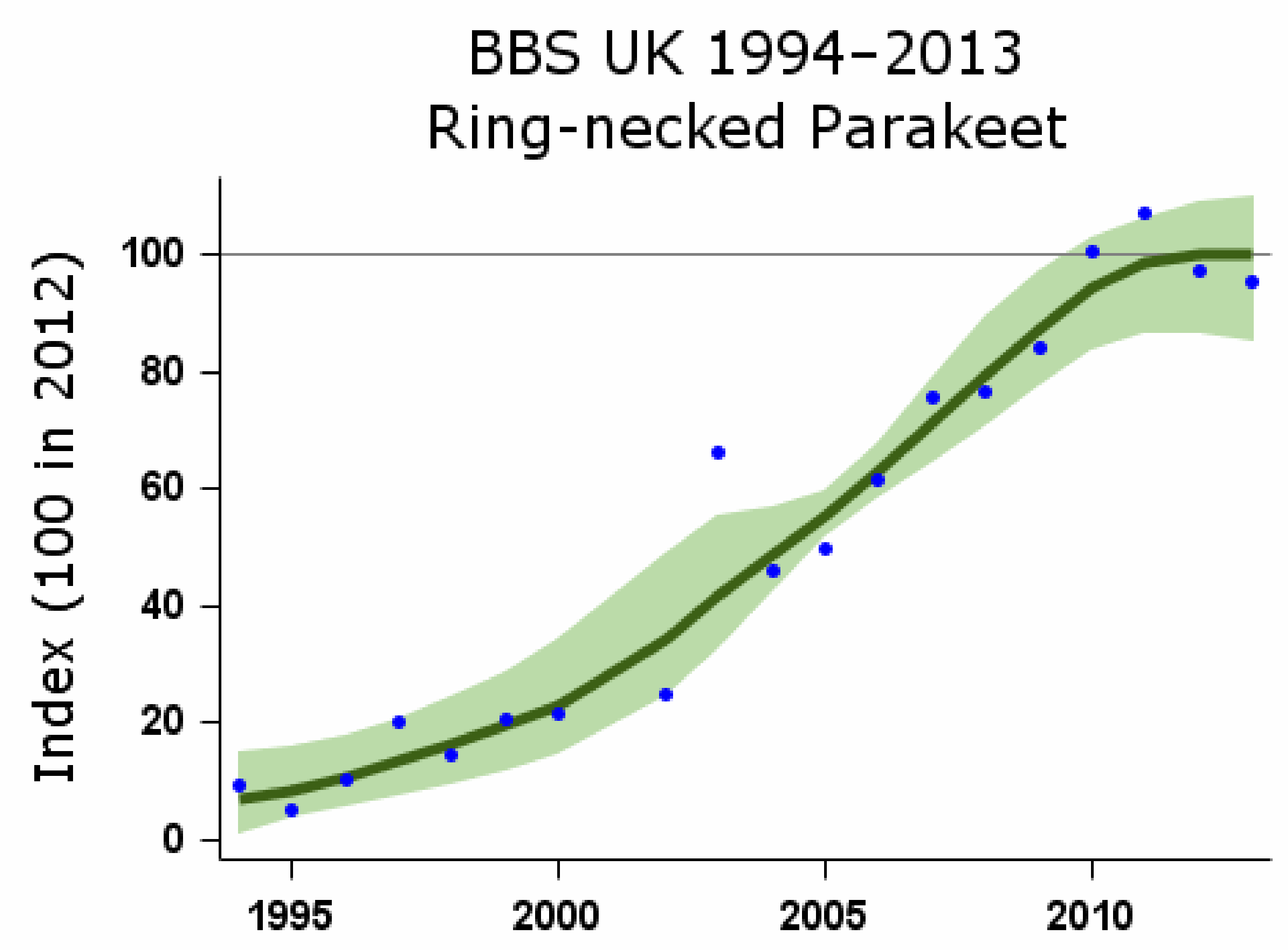
Psittacula krameri

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., Project Parakeet)

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 have since built up, with the two largest being in 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 tenfold increase since 1995. There have been recent post-breeding estimates of more than 30,000 birds at large in the UK (Holling & RBBP 2011a). From 108 nests located during 2001-03, the mean first-egg date was 26 March, median clutch size was 4, and overall nest success 72%, making productivity sufficient to account for the observed population rise, assuming mortality rates remained low (Butler et al. 2013). 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 (Newson et al. 2011). There is evidence, however, that the presence of parakeets reduces feeding rates among native birds (Pecket al. 2014).



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

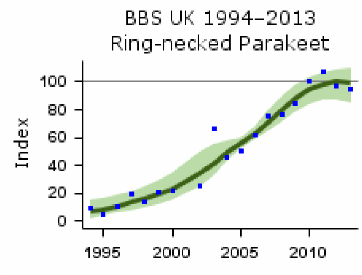
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	17	1995-2012	63	1060	399	3506		
	10	2002-2012	91	193	66	348		

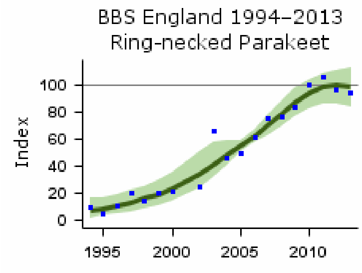
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS England	17	1995-2012	63	1061	383	3575		
	10	2002-2012	91	193	58	382		
	5	2007-2012	116	40	26	60		

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



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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Magpie

Pica pica

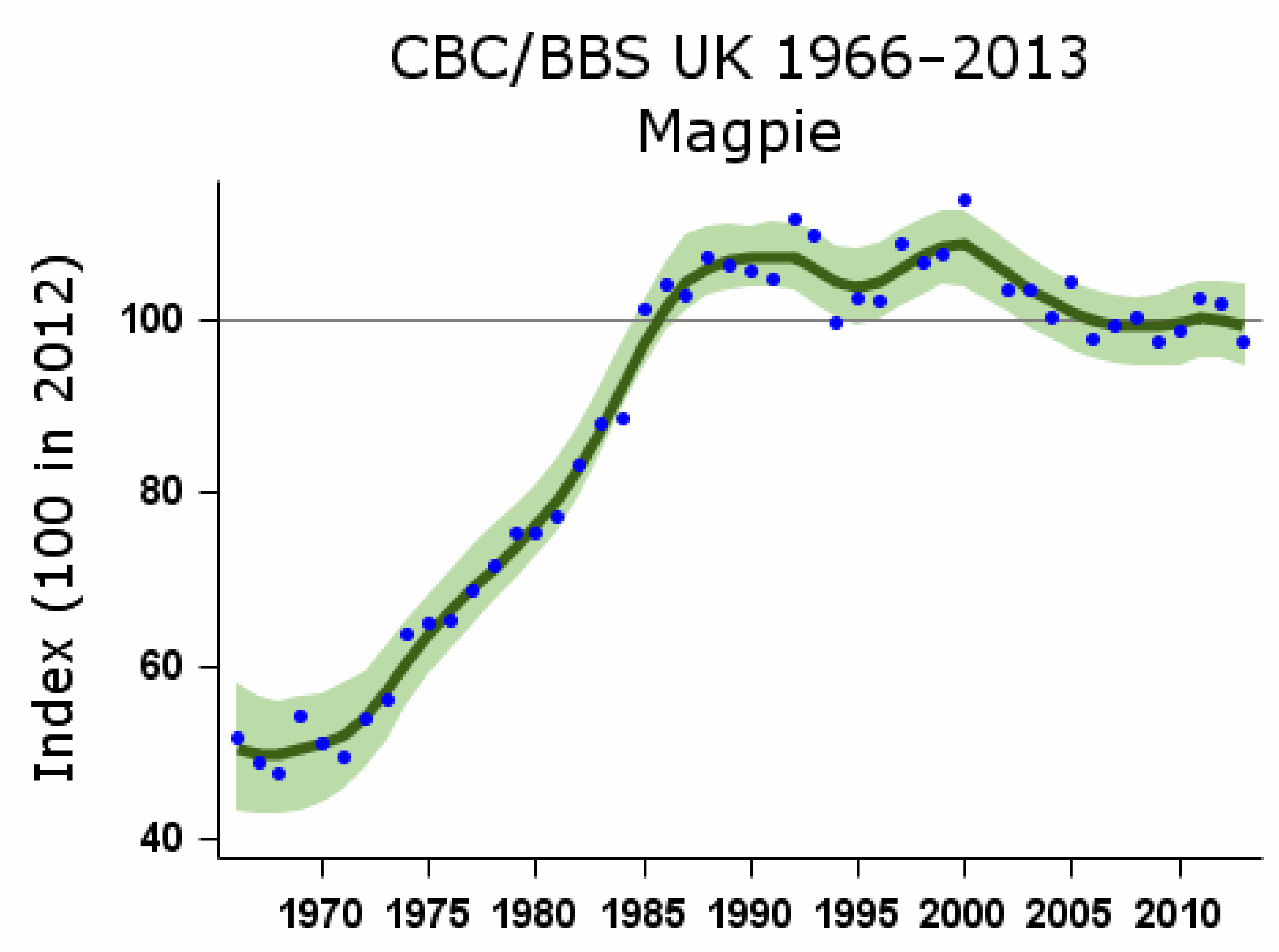
Key facts

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 2014a).



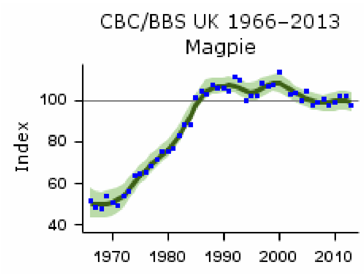
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

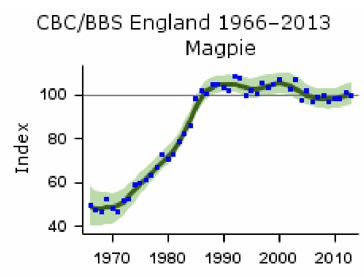
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	45	1967-2012	861	100	65	150		
	25	1987-2012	1428	-4	-13	2		
	10	2002-2012	2146	-5	-7	-2		
	5	2007-2012	2376	1	-2	3		
CBC/BBS England	45	1967-2012	729	107	68	165		
	25	1987-2012	1206	-2	-10	7		
	10	2002-2012	1798	-4	-7	-2		
	5	2007-2012	2013	1	-1	4		
BBS UK	17	1995-2012	1910	-1	-5	3		
	10	2002-2012	2146	-5	-7	-2		
	5	2007-2012	2376	1	-1	4		
BBS England	17	1995-2012	1602	-1	-6	4		
	10	2002-2012	1798	-4	-8	-1		
	5	2007-2012	2013	1	-1	4		
BBS Scotland	17	1995-2012	49	25	-5	79		
	10	2002-2012	57	11	-13	49		
	5	2007-2012	68	10	-4	26		
BBS Wales	17	1995-2012	162	-33	-51	-6	>25	
	10	2002-2012	178	-8	-17	1		
	5	2007-2012	176	-1	-7	6		
BBS N.Ireland	17	1995-2012	84	16	-7	41		
	10	2002-2012	98	-15	-26	-5		
	5	2007-2012	102	-3	-12	7		

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

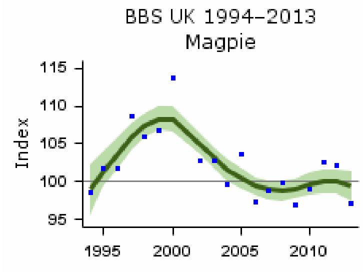
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



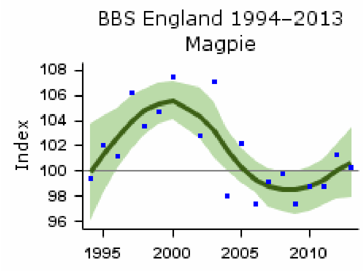
CBC/BBS UK graph



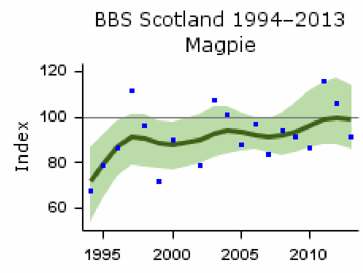
CBC/BBS England graph



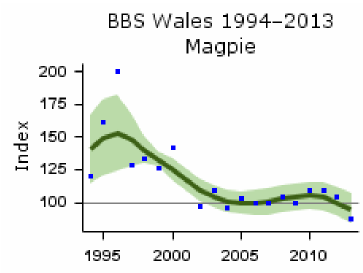
BBS UK graph



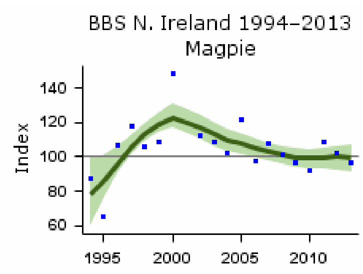
BBS England graph



BBS Scotland graph

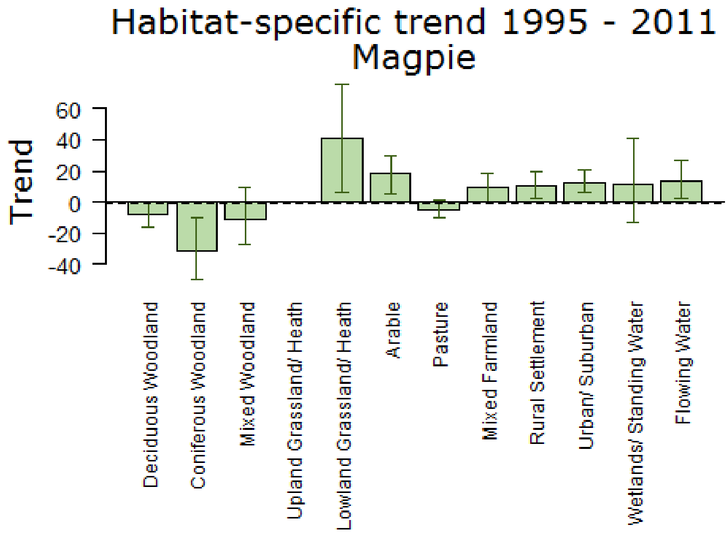


BBS Wales graph



BBS N.Ireland graph

Population trends by habitat



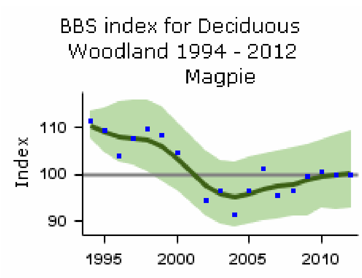
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

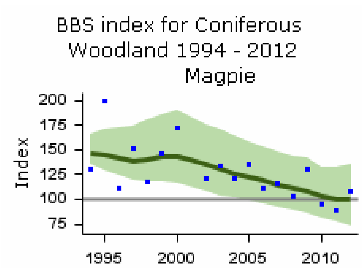
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	470	-8	-16	0
Coniferous Woodland	16	1995-2011	58	-31	-49	-10
Mixed Woodland	16	1995-2011	181	-11	-27	9
Lowland Grassland/ Heath	16	1995-2011	100	41	6	75
Arable	16	1995-2011	404	18	5	30
Pasture	16	1995-2011	911	-5	-10	1
Mixed Farmland	16	1995-2011	412	9	0	18
Rural Settlement	16	1995-2011	553	11	2	20
Urban/ Suburban	16	1995-2011	379	13	6	21
Wetlands/ Standing Water	16	1995-2011	67	11	-13	41
Flowing Water	16	1995-2011	310	14	2	27

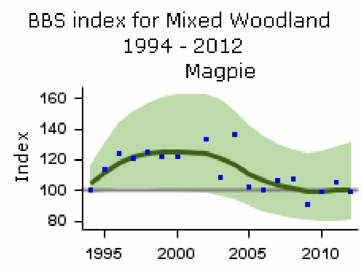
Further information on habitat-specific trends, please follow link here.



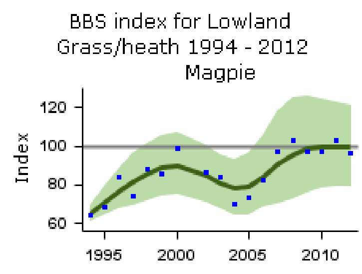
Habitat graph



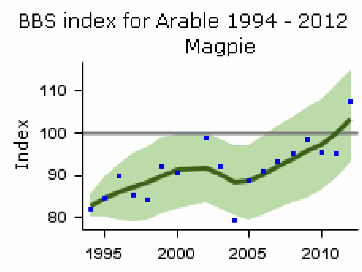
Habitat graph



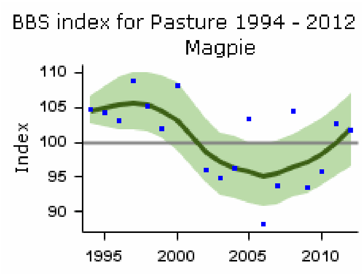
Habitat graph



Habitat graph



Habitat graph



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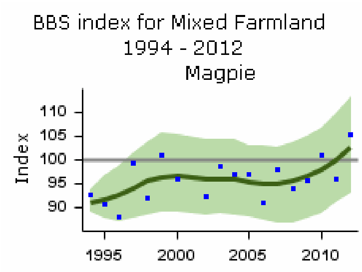
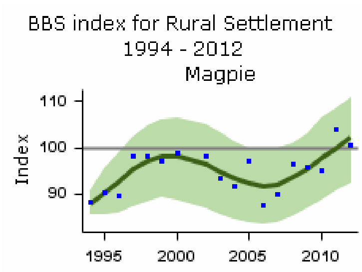


Habitat graph



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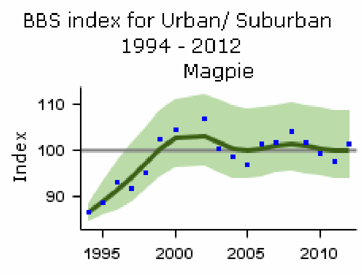

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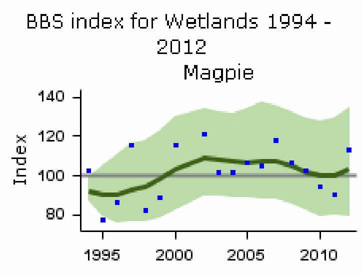

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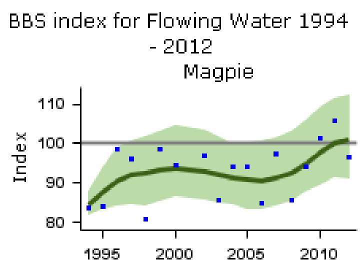
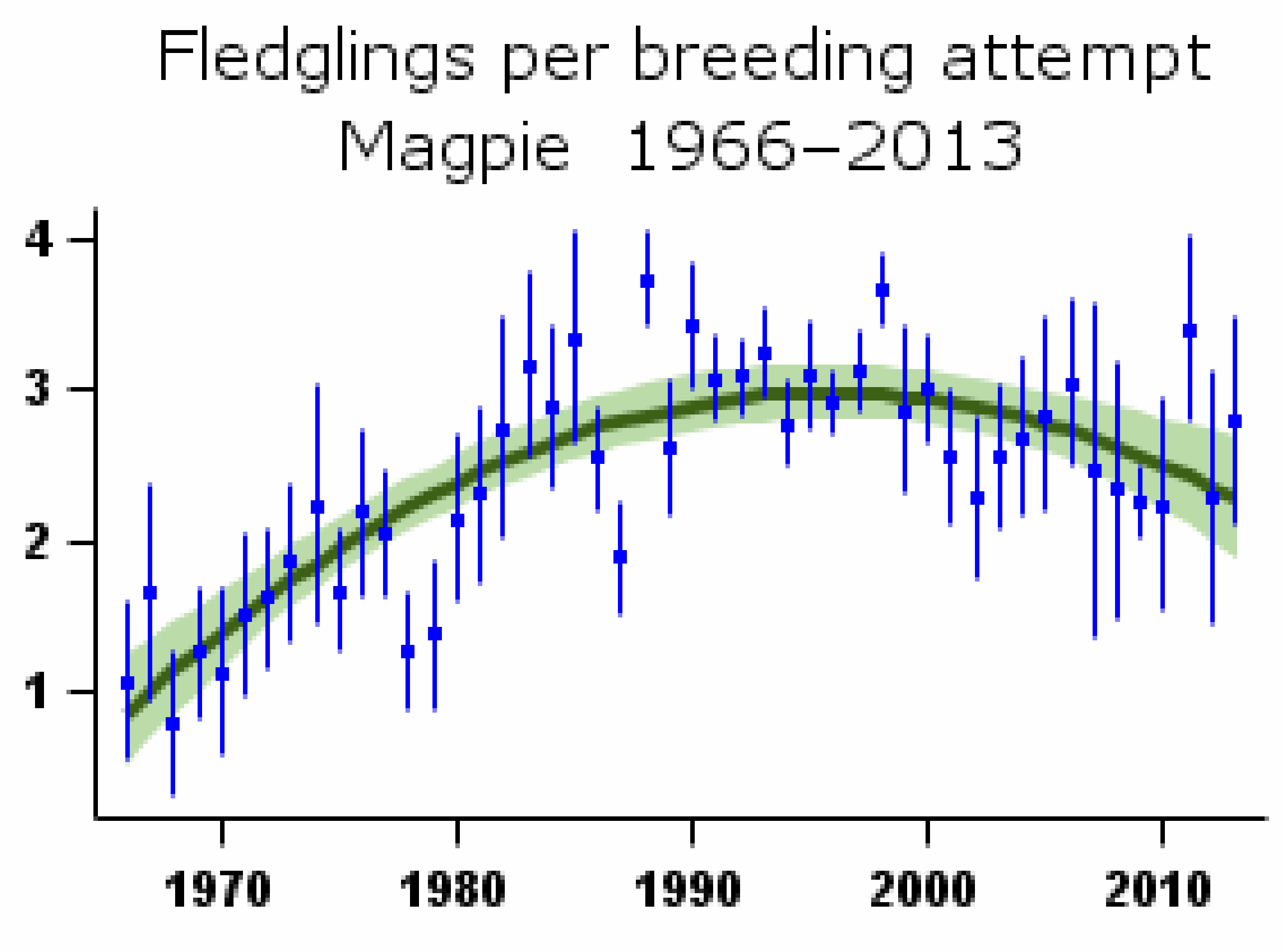
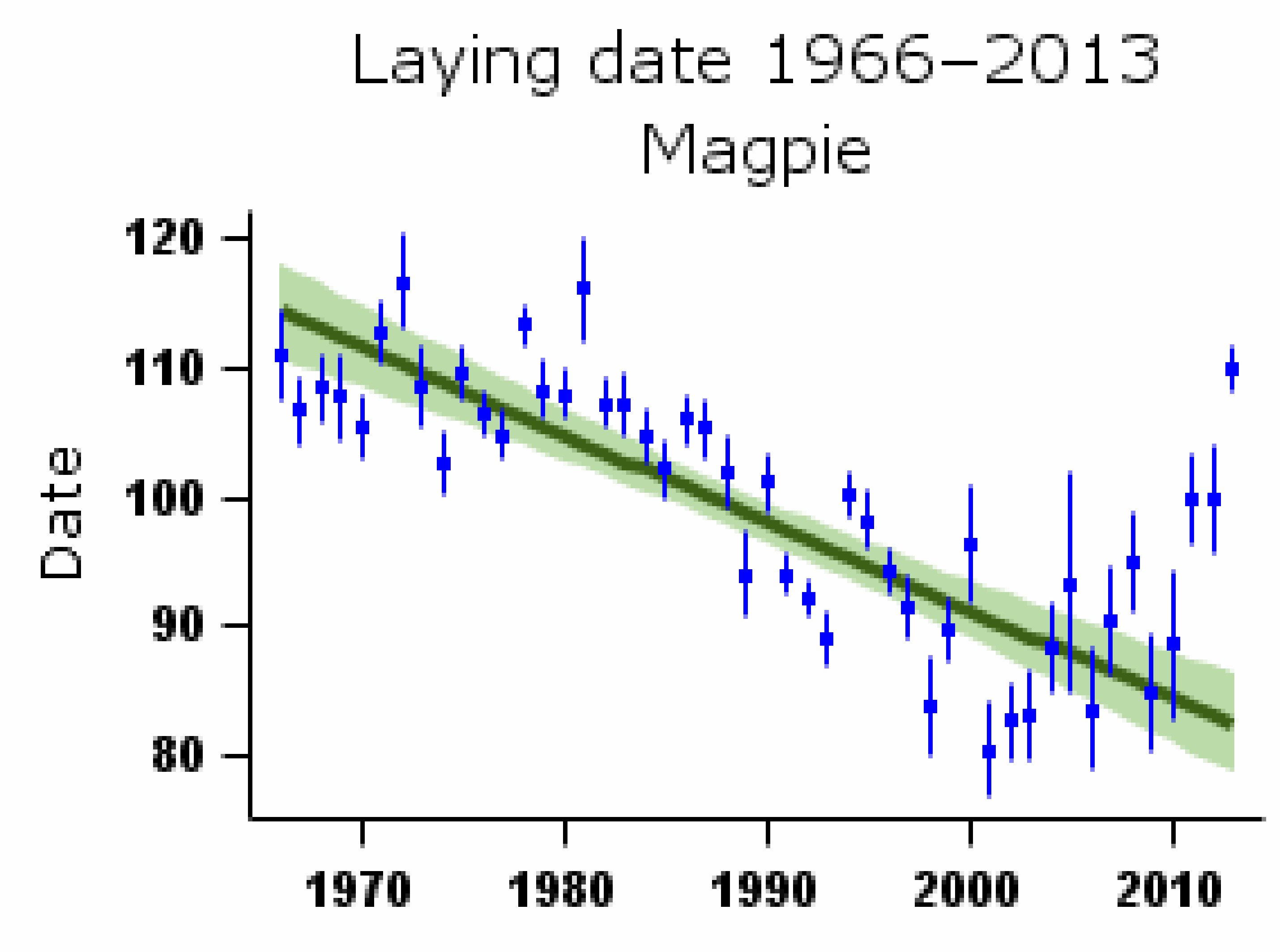


Habitat graph

Demographic trends



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

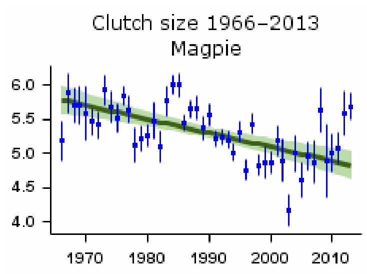


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

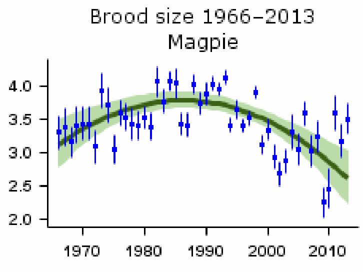
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	42	Curvilinear	1.14 fledglings	2.36 fledglings	107.8%		
Clutch size	44	1968-2012	43	Linear decline	5.75 eggs	4.86 eggs	-15.5%		
Brood size	44	1968-2012	81	Curvilinear	3.25 chicks	2.70 chicks	-17.0%		
Nest failure rate at egg stage	44	1968-2012	49	Linear decline	2.69% nests/day	0.20% nests/day	-92.6%		
Nest failure rate at chick stage	44	1968-2012	48	Linear decline	1.63% nests/day	0.10% nests/day	-93.9%		
Laying date	44	1968-2012	33	Linear decline	Apr 23	Mar 24	-30 days		

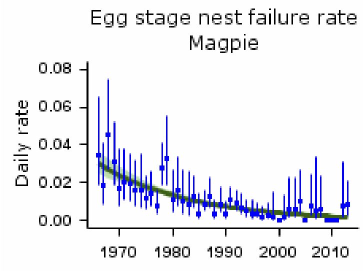
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



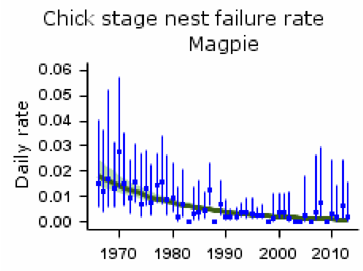
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



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 strongly 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.

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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris,

Jay

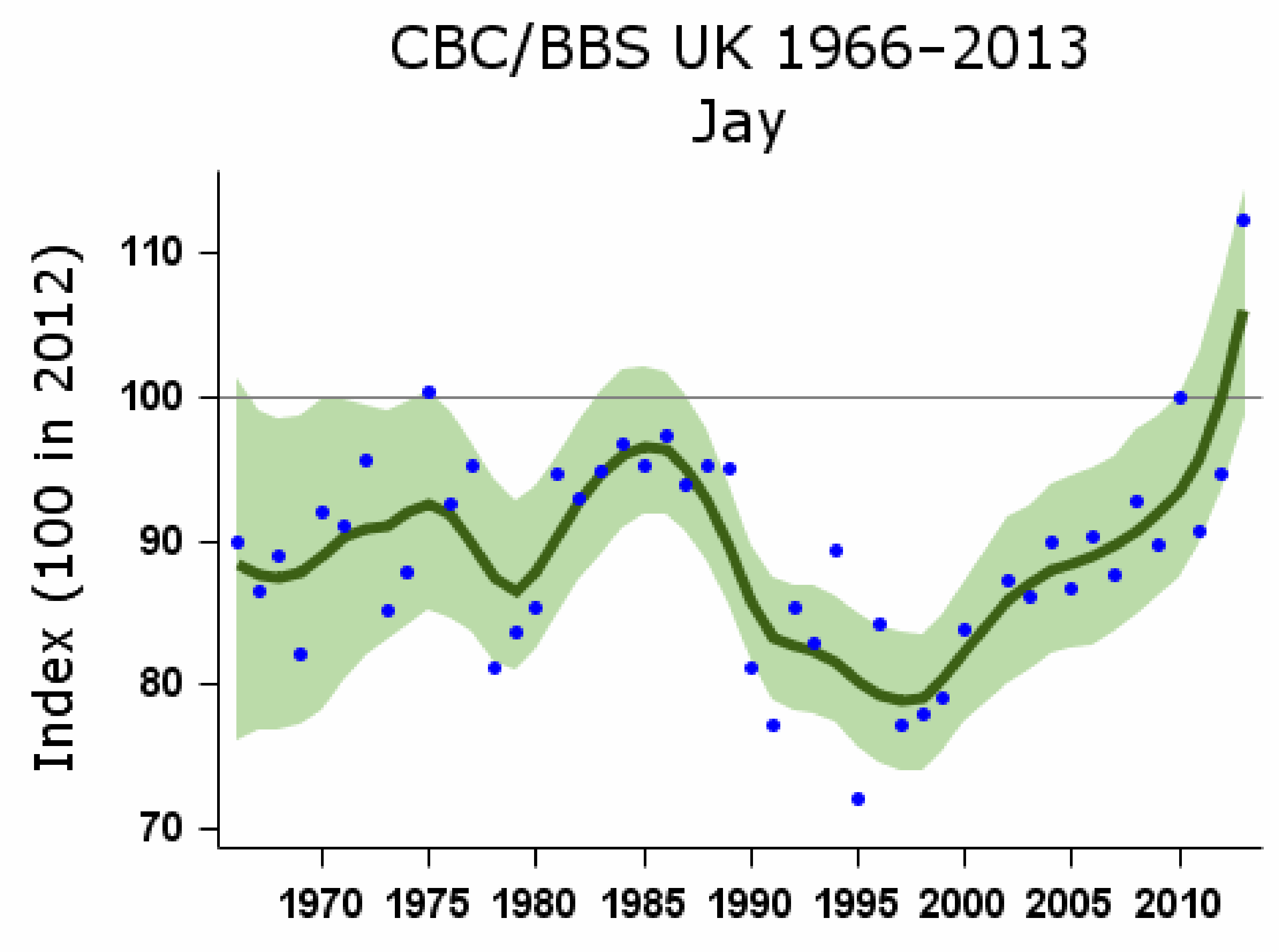
Garrulus glandarius

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). With the losses since the 1980s now regained, long-term trends are stable overall. The BBS PECBMS 2014a).



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

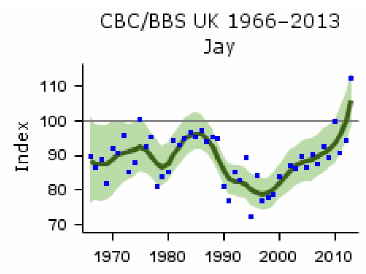
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	45	1967-2012	383	14	-6	41		Small CBC sample
	25	1987-2012	601	5	-6	17		Small CBC sample
	10	2002-2012	901	16	10	26		
	5	2007-2012	1016	12	7	18		
CBC/BBS England	45	1967-2012	337	7	-13	36		Small CBC sample
	25	1987-2012	525	-1	-12	13		Small CBC sample

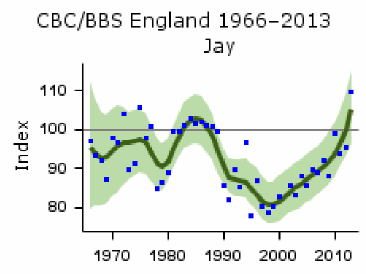
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	10	2002-2012	778	20	12	27		
	5	2007-2012	883	12	7	19		
BBS UK	17	1995-2012	767	25	16	33		
	10	2002-2012	901	18	12	26		
	5	2007-2012	1016	12	8	18		
BBS England	17	1995-2012	665	16	6	25		
	10	2002-2012	778	20	13	28		
	5	2007-2012	883	12	6	20		
BBS Wales	17	1995-2012	73	37	5	64		
	10	2002-2012	84	8	-15	35		
	5	2007-2012	88	-8	-27	16		

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

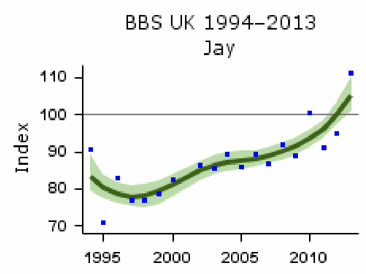
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



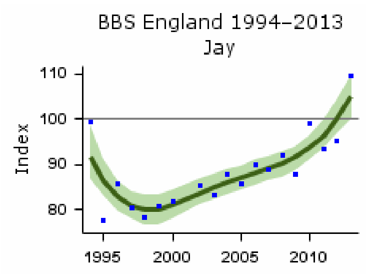
CBC/BBS UK graph



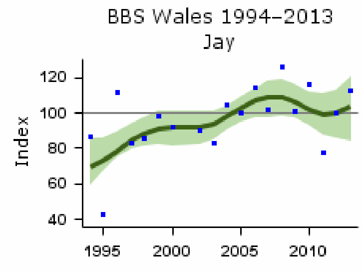
CBC/BBS England graph



BBS UK graph

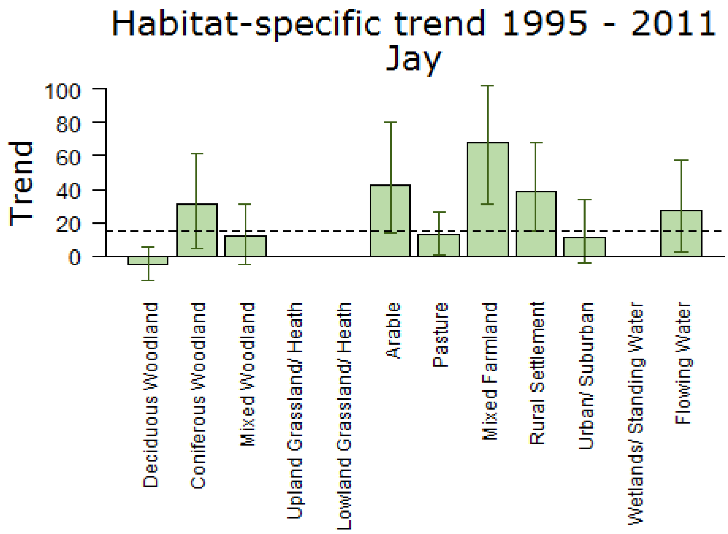


BBS England graph



BBS Wales graph

Population trends by habitat



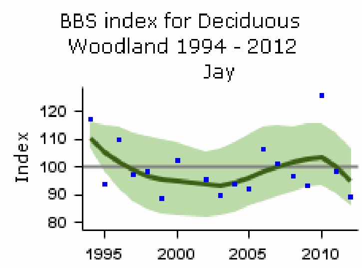
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

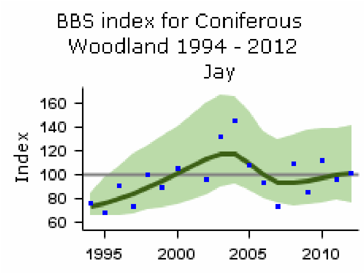
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	218	-5	-14	5
Coniferous Woodland	16	1995-2011	46	31	4	62
Mixed Woodland	16	1995-2011	121	12	-5	31
Arable	16	1995-2011	111	42	14	80
Pasture	16	1995-2011	206	13	1	26
Mixed Farmland	16	1995-2011	67	68	31	102
Rural Settlement	16	1995-2011	102	39	15	68
Urban/ Suburban	16	1995-2011	80	11	-4	34
Flowing Water	16	1995-2011	68	27	2	57

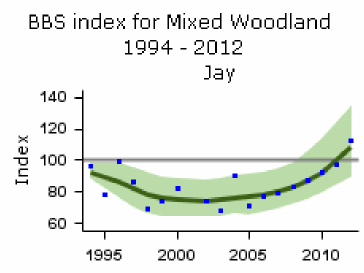
Further information on habitat-specific trends, please follow link here.



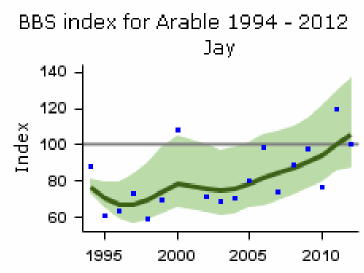
Habitat graph



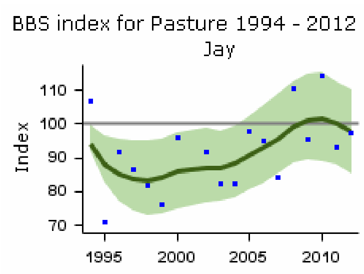
Habitat graph



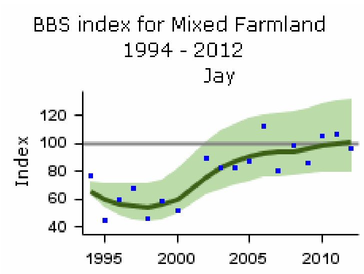
Habitat graph



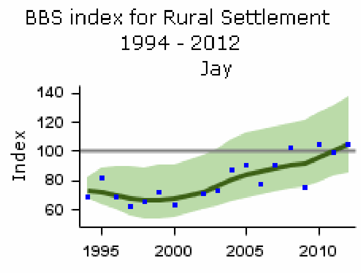
Habitat graph



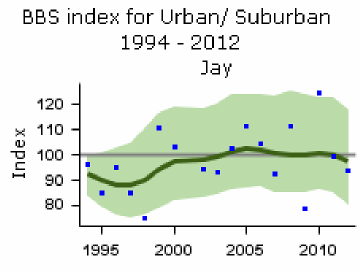
Habitat graph



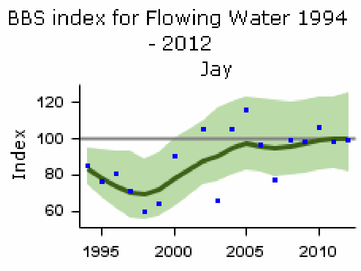
Habitat graph



Habitat graph



Habitat graph

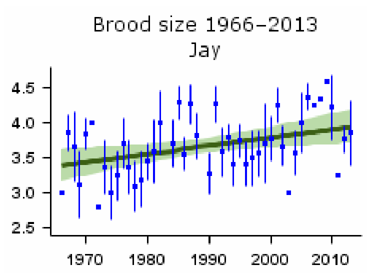


Habitat graph

Demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Brood size	44	1968-2012	11	Linear increase	3.42 chicks	3.93 chicks	15.1%		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 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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Jackdaw

Coloeus monedula

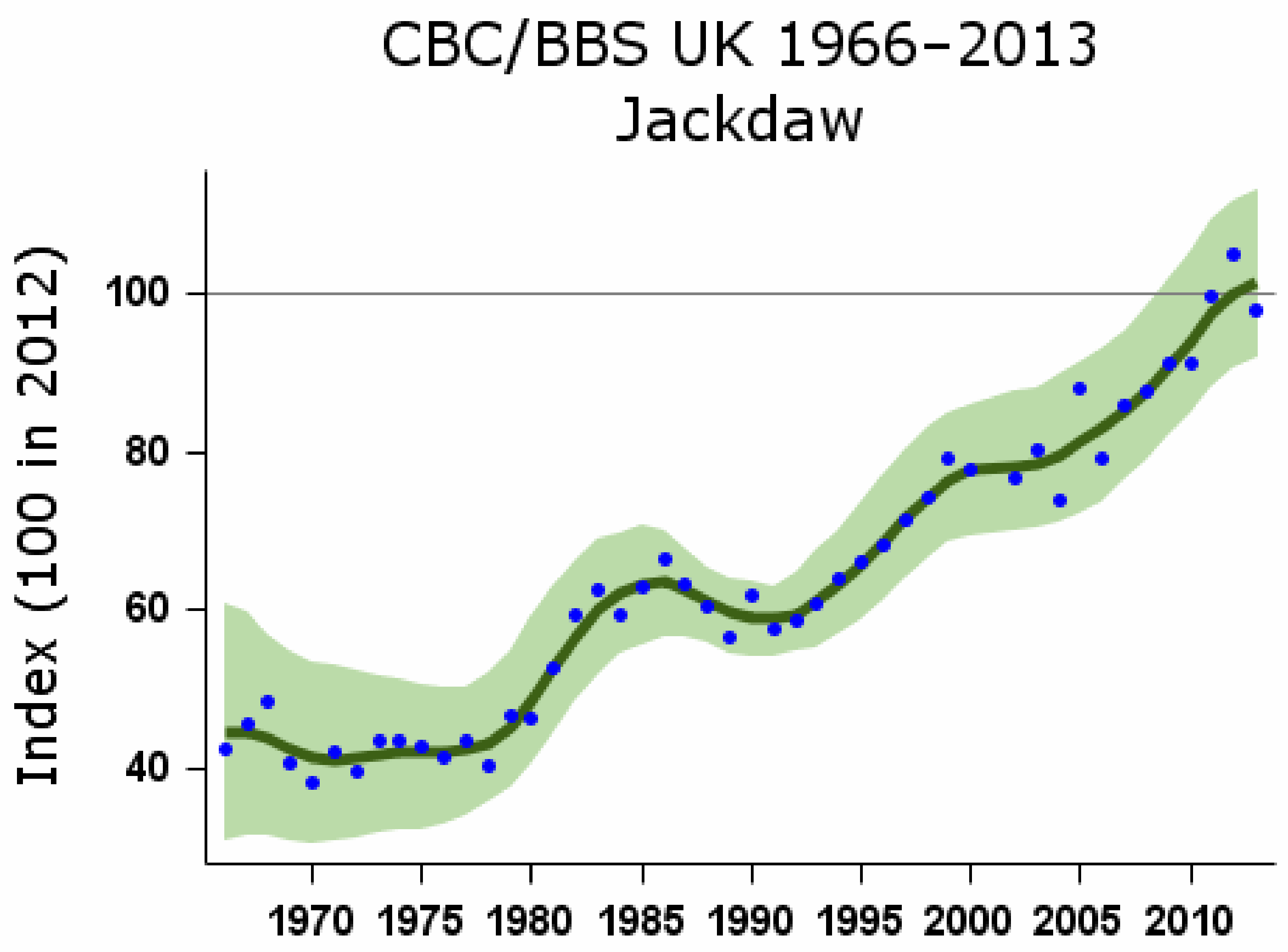
Key facts

Conservation listings:	Europe: no SPEC category (concentrated in Europe, conservation status favourable) (BiE04) UK: green (BoCC3)
Long-term trend:	UK, England: rapid 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 2014a).



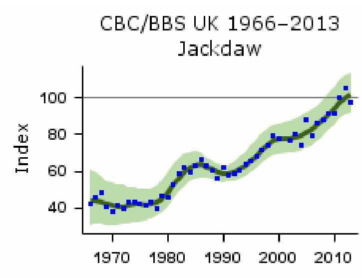
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

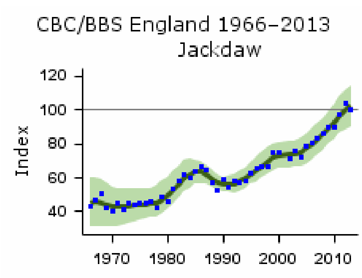
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	45	1967-2012	728	126	46	263		
	25	1987-2012	1256	60	32	98		
	10	2002-2012	1993	28	23	36		
	5	2007-2012	2267	17	13	21		
CBC/BBS England	45	1967-2012	586	118	43	262		
	25	1987-2012	1008	62	33	100		
	10	2002-2012	1605	36	28	42		
	5	2007-2012	1849	21	15	27		
BBS UK	17	1995-2012	1728	53	43	67		
	10	2002-2012	1993	30	24	37		
	5	2007-2012	2267	19	15	23		
BBS England	17	1995-2012	1386	61	51	72		
	10	2002-2012	1605	35	29	44		
	5	2007-2012	1849	21	16	27		
BBS Scotland	17	1995-2012	121	21	-5	49		
	10	2002-2012	136	13	-3	35		
	5	2007-2012	160	10	-4	26		
BBS Wales	17	1995-2012	141	25	-11	62		
	10	2002-2012	157	8	-5	21		
	5	2007-2012	158	6	-10	19		
BBS N.Ireland	17	1995-2012	77	108	46	158		
	10	2002-2012	91	41	22	66		
	5	2007-2012	96	31	16	45		

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

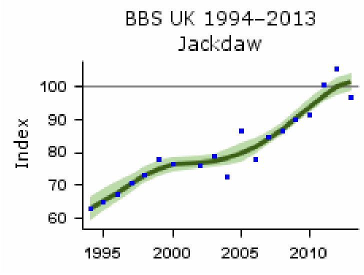
BTO JNCC rspb The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



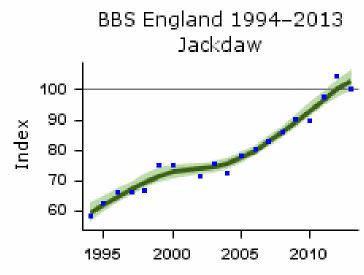
CBC/BBS UK graph



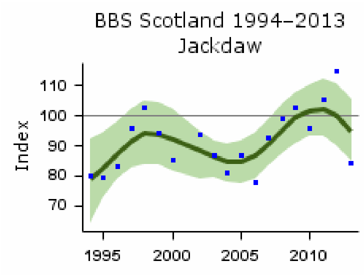
CBC/BBS England graph



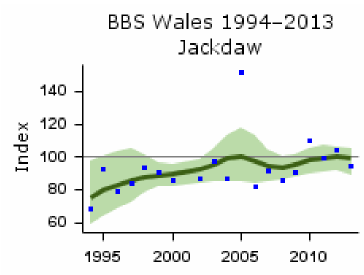
BBS UK graph



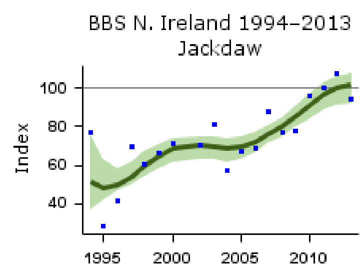
BBS England graph



BBS Scotland graph

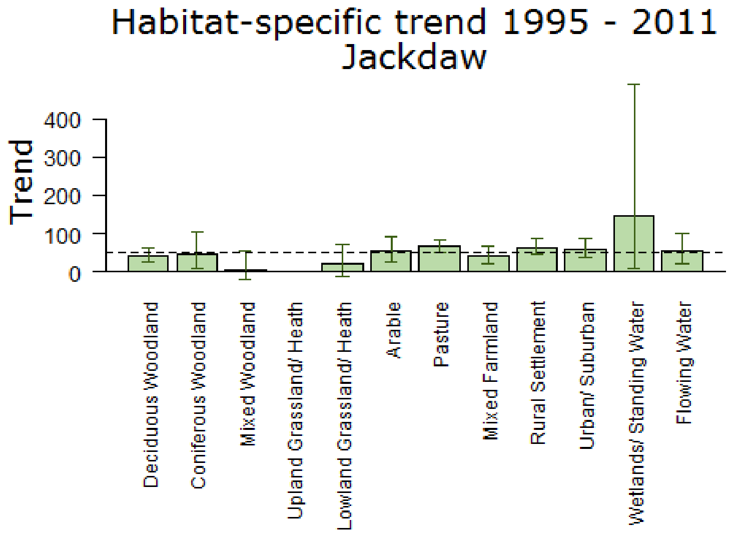


BBS Wales graph



BBS N.Ireland graph

Population trends by habitat



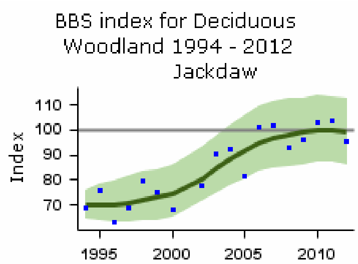
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

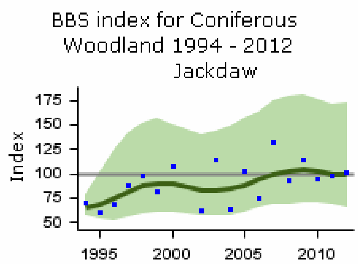
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	337	43	24	61
Coniferous Woodland	16	1995-2011	45	46	9	106
Mixed Woodland	16	1995-2011	158	5	-19	54
Lowland Grassland/ Heath	16	1995-2011	62	21	-13	73
Arable	16	1995-2011	306	56	27	93
Pasture	16	1995-2011	759	66	51	82
Mixed Farmland	16	1995-2011	330	42	23	67
Rural Settlement	16	1995-2011	504	64	45	87
Urban/ Suburban	16	1995-2011	213	59	39	87
Wetlands/ Standing Water	16	1995-2011	34	147	10	490
Flowing Water	16	1995-2011	210	55	22	98

Further information on habitat-specific trends, please follow link here.



Habitat graph



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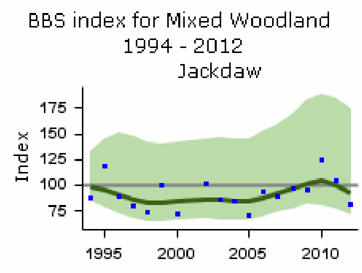

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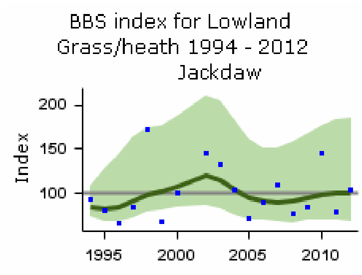

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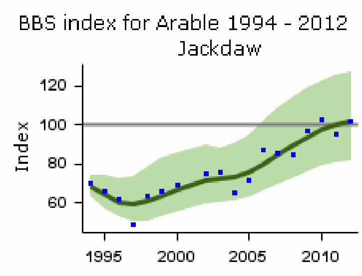
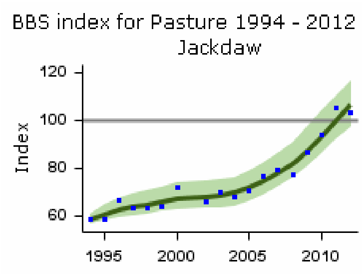
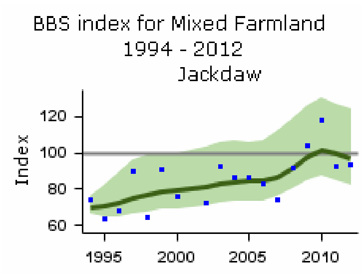


Habitat graph



Habitat graph



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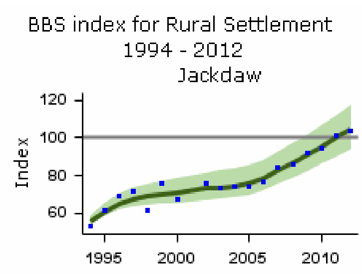
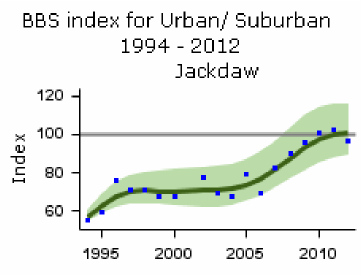
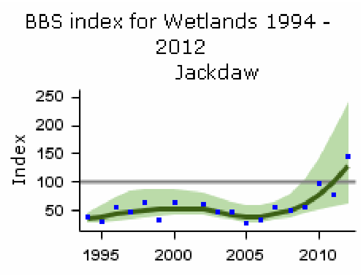


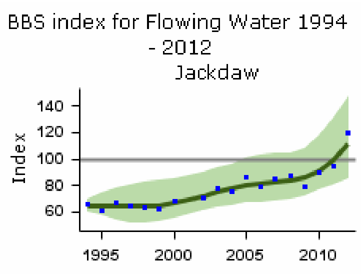
Habitat graph



Habitat graph

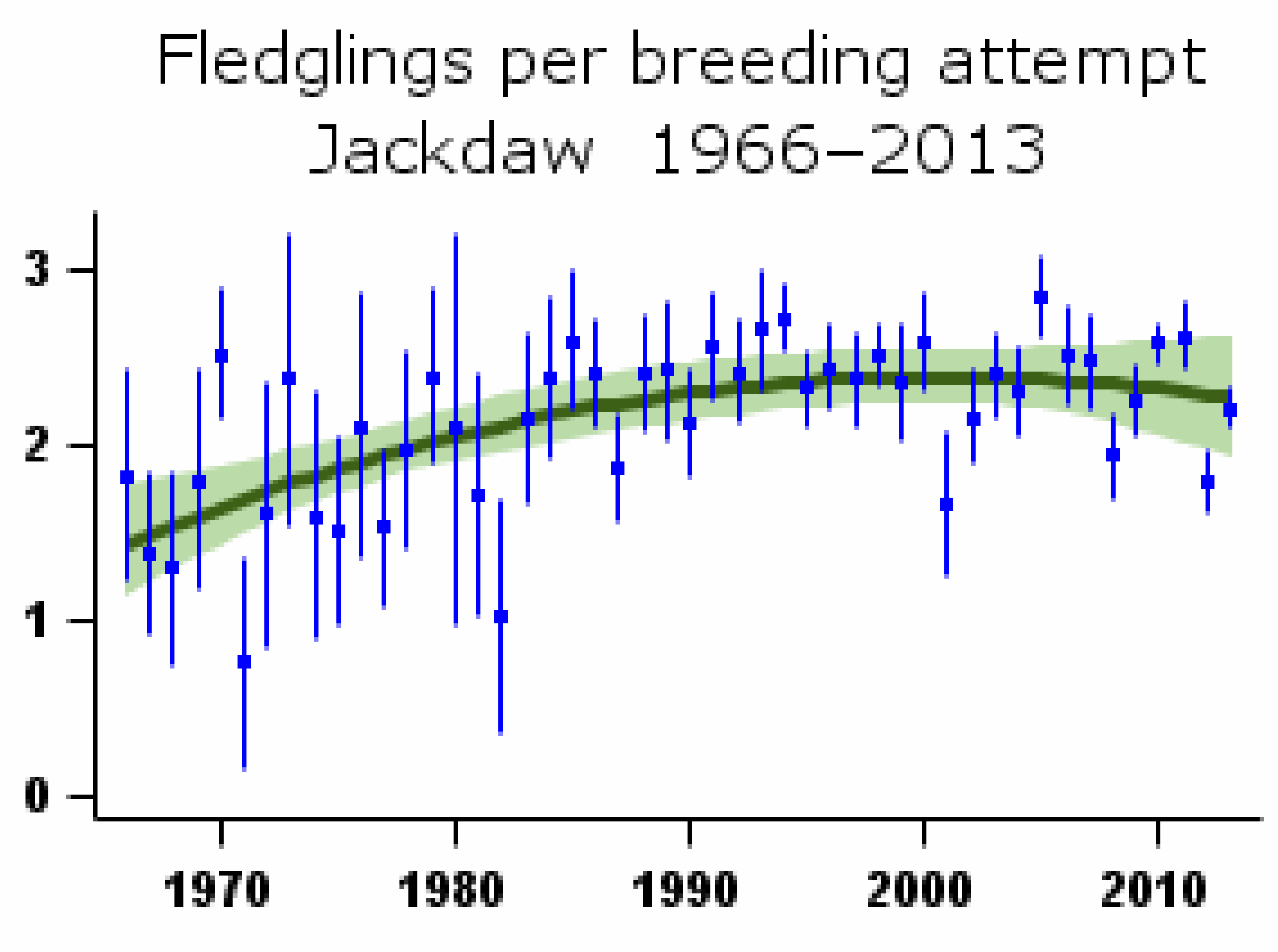


Habitat graph

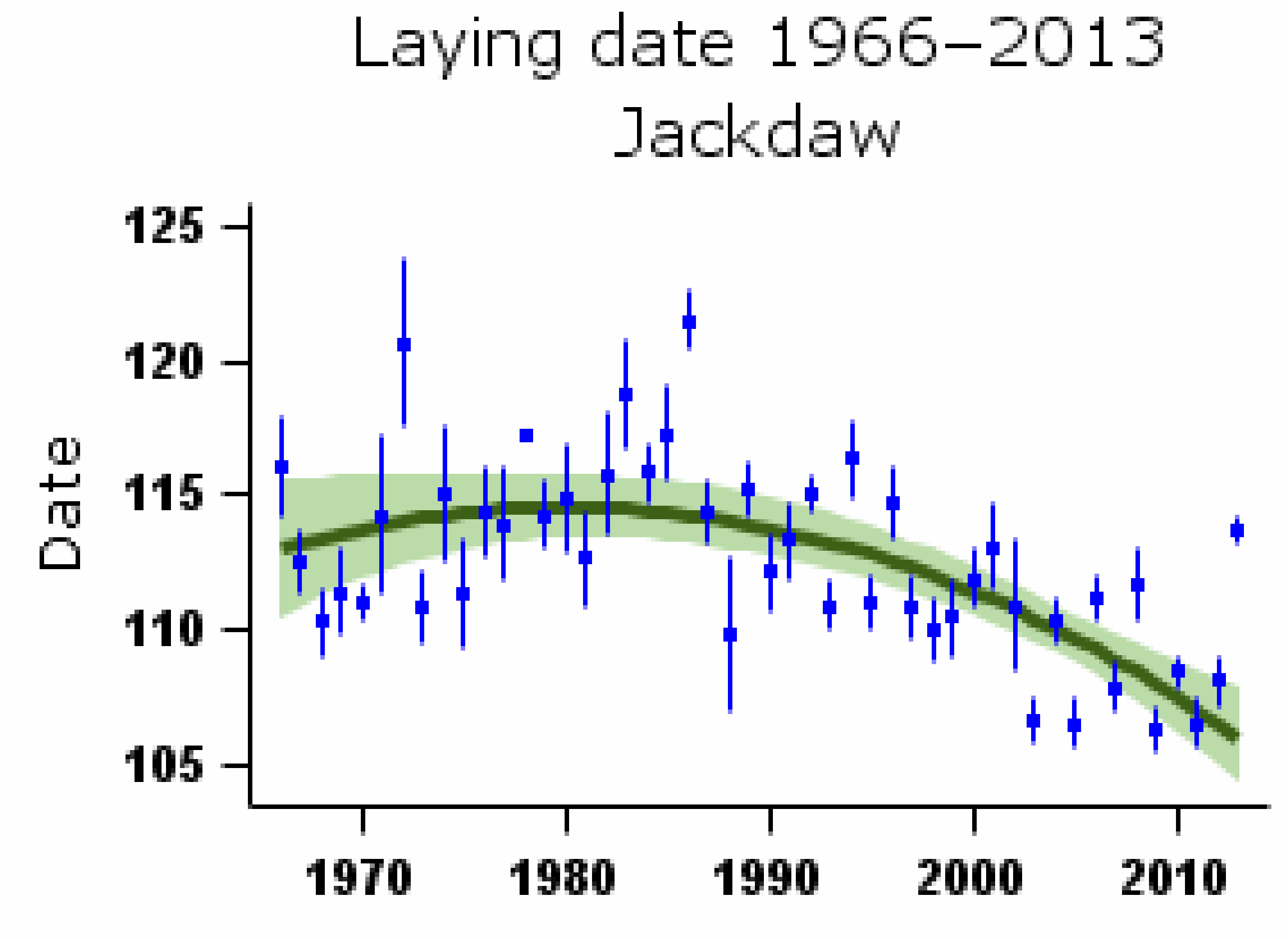


Habitat graph

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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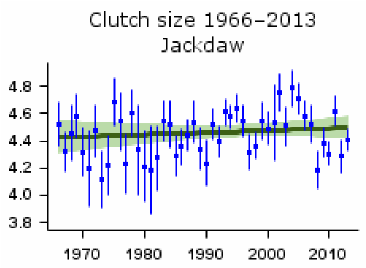
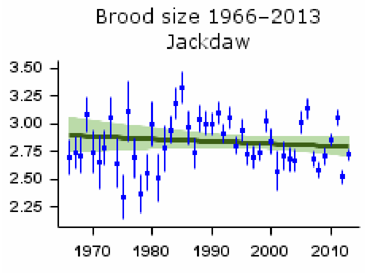
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	61	Curvilinear	1.54 fledglings	2.28 fledglings	47.9%		
Clutch size	44	1968-2012	56	None					
Brood size	44	1968-2012	133	None					
Nest failure rate at egg stage	44	1968-2012	72	Curvilinear	0.83% nests/day	0.30% nests/day	-63.9%		
Nest failure rate at chick stage	44	1968-2012	65	Curvilinear	1.33% nests/day	0.35% nests/day	-73.7%		
Laying date	44	1968-2012	31	Curvilinear	Apr 23	Apr 17	-6 days		

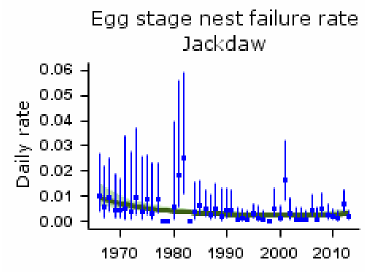
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



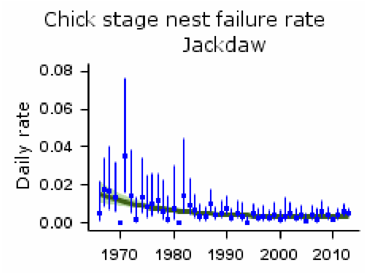
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



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 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. There have been 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 by almost a week.

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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Rook

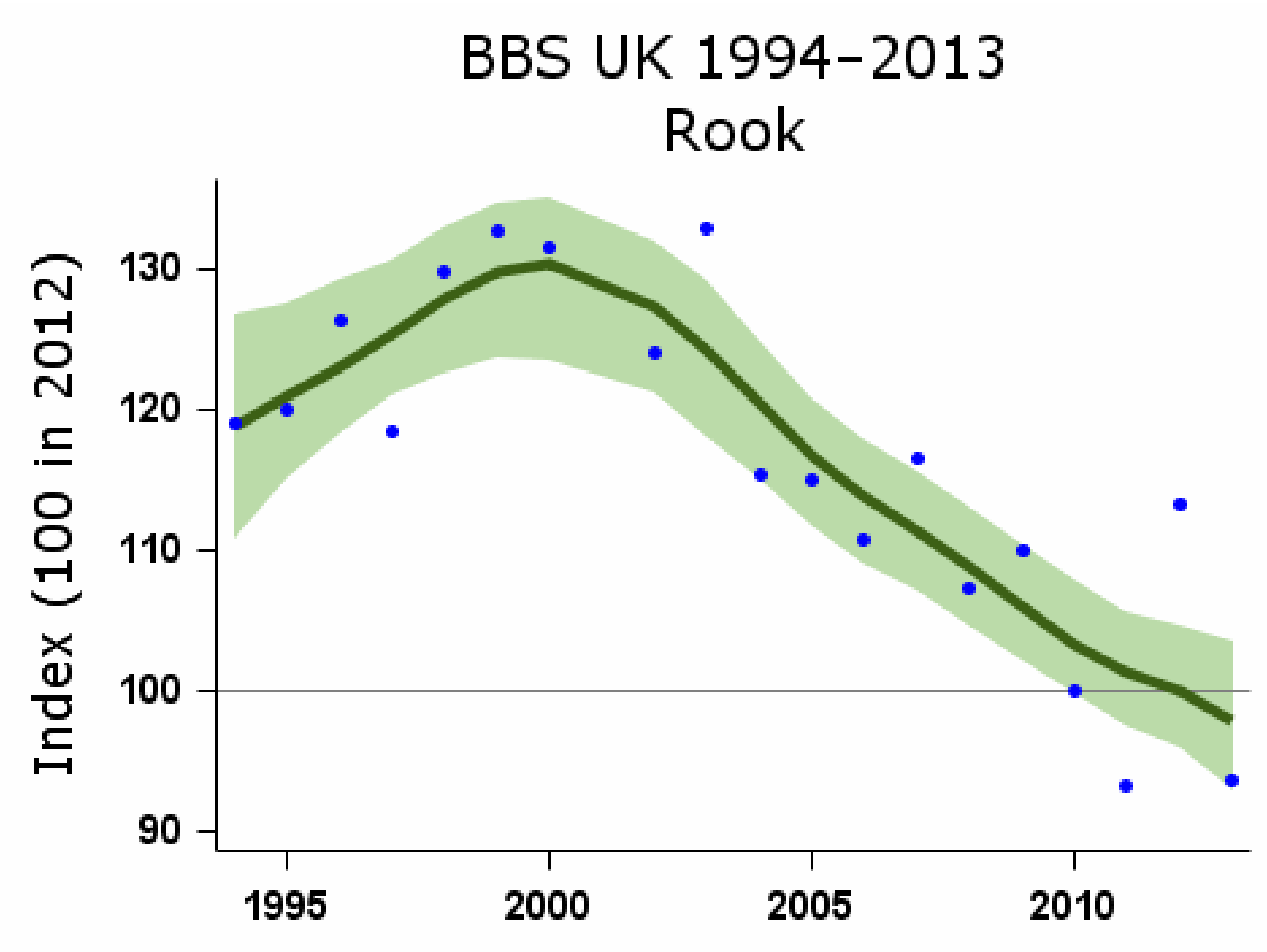
Corvus frugilegus

Key facts

Conservation listings:	Europe: no SPEC category (not concentrated in Europe, conservation status favourable) (BiE04) UK: green (BoCC3)
Long-term trend:	UK: probable 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 CBC nest counts showed a shallow, long-term increase (Wilson et al. 1998). Increase to the mid 1990s was 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 reflected the species' considerable adaptability in the face of agricultural change. BBS indices, which are drawn from sightings during transect walks and not from BBS's nest counts, suggest that a notable decrease has occurred subsequently, especially in Scotland and Northern Ireland, since around 2000. The BBS PECBMS 2014a).



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

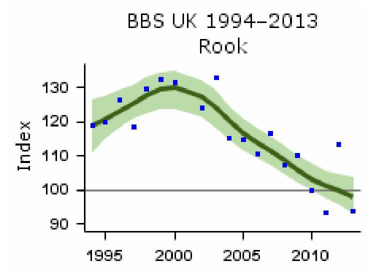
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	17	1995-2012	1323	-17	-24	-10		
	10	2002-2012	1467	-21	-27	-14		
	5	2007-2012	1640	-10	-15	-5		
BBS England	17	1995-2012	1052	-12	-21	-2		

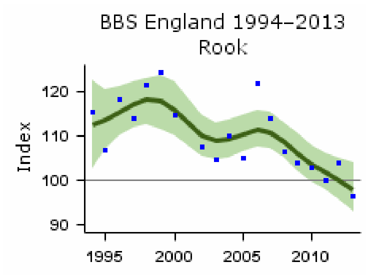
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	10	2002-2012	1170	-9	-16	-1		
	5	2007-2012	1325	-10	-15	4		
BBS Scotland	17	1995-2012	115	-35	-47	-14	>25	
	10	2002-2012	122	-42	-54	-22	>25	
	5	2007-2012	140	-19	-33	4		
BBS Wales	17	1995-2012	79	-24	-45	3		
	10	2002-2012	85	-10	-31	22		
	5	2007-2012	84	-5	-20	18		
BBS N.Ireland	17	1995-2012	75	-8	-37	28		
	10	2002-2012	88	-40	-56	-23	>25	
	5	2007-2012	90	-9	-30	14		

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

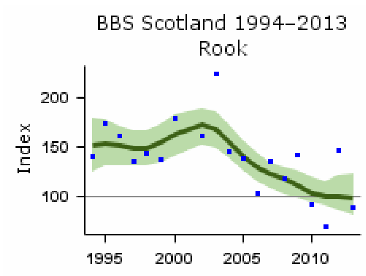
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



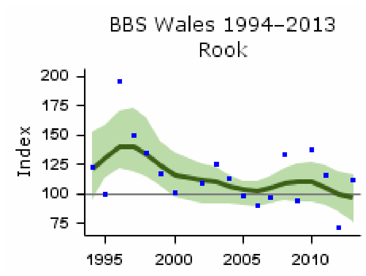
BBS UK graph



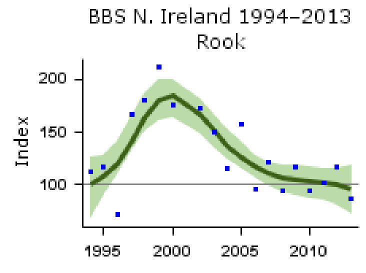
BBS England graph



BBS Scotland graph

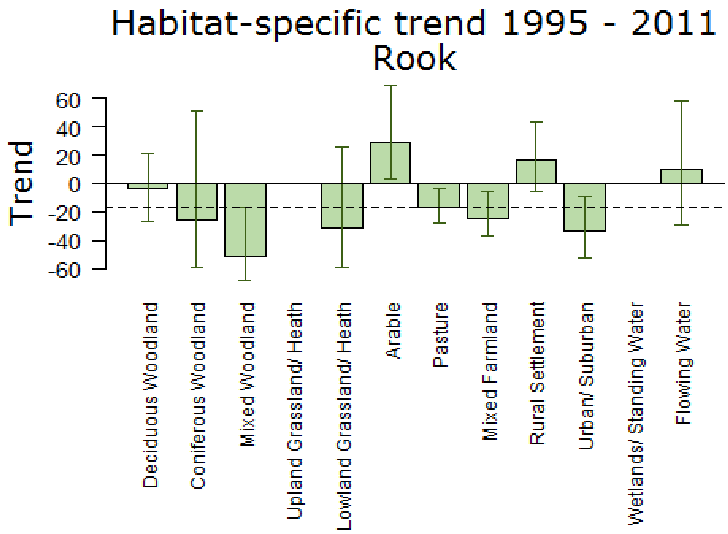


BBS Wales graph



BBS N.Ireland graph

Population trends by habitat



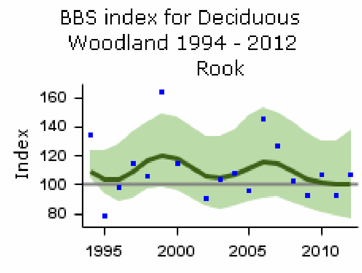
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

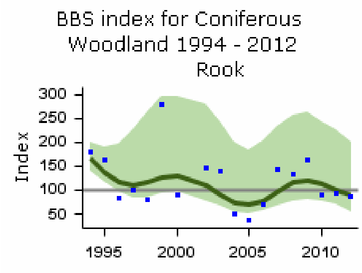
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	191	-4	-27	22
Coniferous Woodland	16	1995-2011	32	-26	-60	52
Mixed Woodland	16	1995-2011	86	-51	-68	-17
Lowland Grassland/ Heath	16	1995-2011	39	-32	-60	26
Arable	16	1995-2011	241	29	4	69
Pasture	16	1995-2011	538	-17	-28	-3
Mixed Farmland	16	1995-2011	263	-24	-37	-5
Rural Settlement	16	1995-2011	275	16	-6	43
Urban/ Suburban	16	1995-2011	91	-34	-53	-9
Flowing Water	16	1995-2011	121	10	-29	58

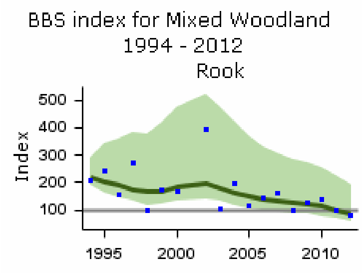
Further information on habitat-specific trends, please follow link here.



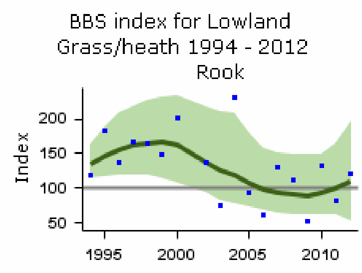
Habitat graph



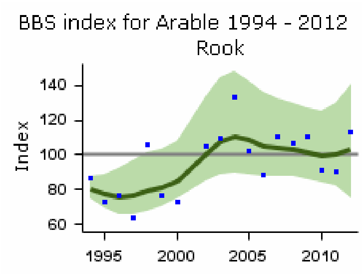
Habitat graph



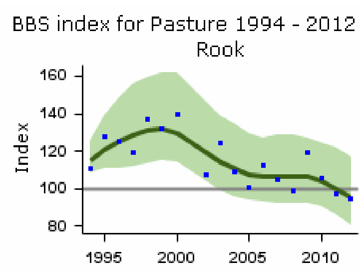
Habitat graph



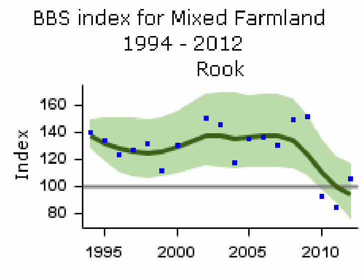
Habitat graph



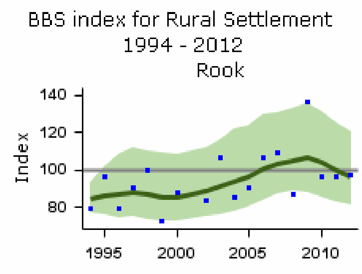
Habitat graph



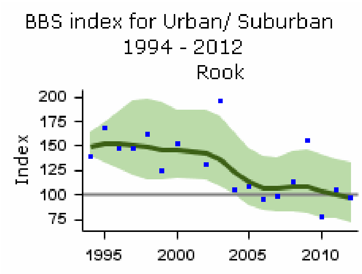
Habitat graph



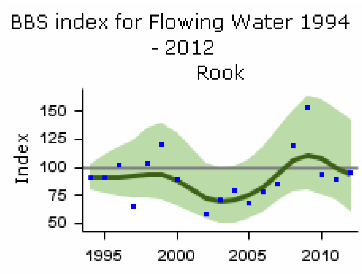
Habitat graph



Habitat graph



Habitat graph

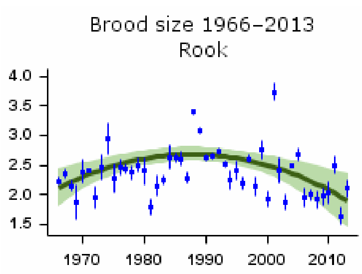


Habitat graph

Demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Brood size	44	1968-2012	78	Curvilinear	2.21 chicks	1.95 chicks	-11.4%		

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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Carrion Crow

Corvus corone

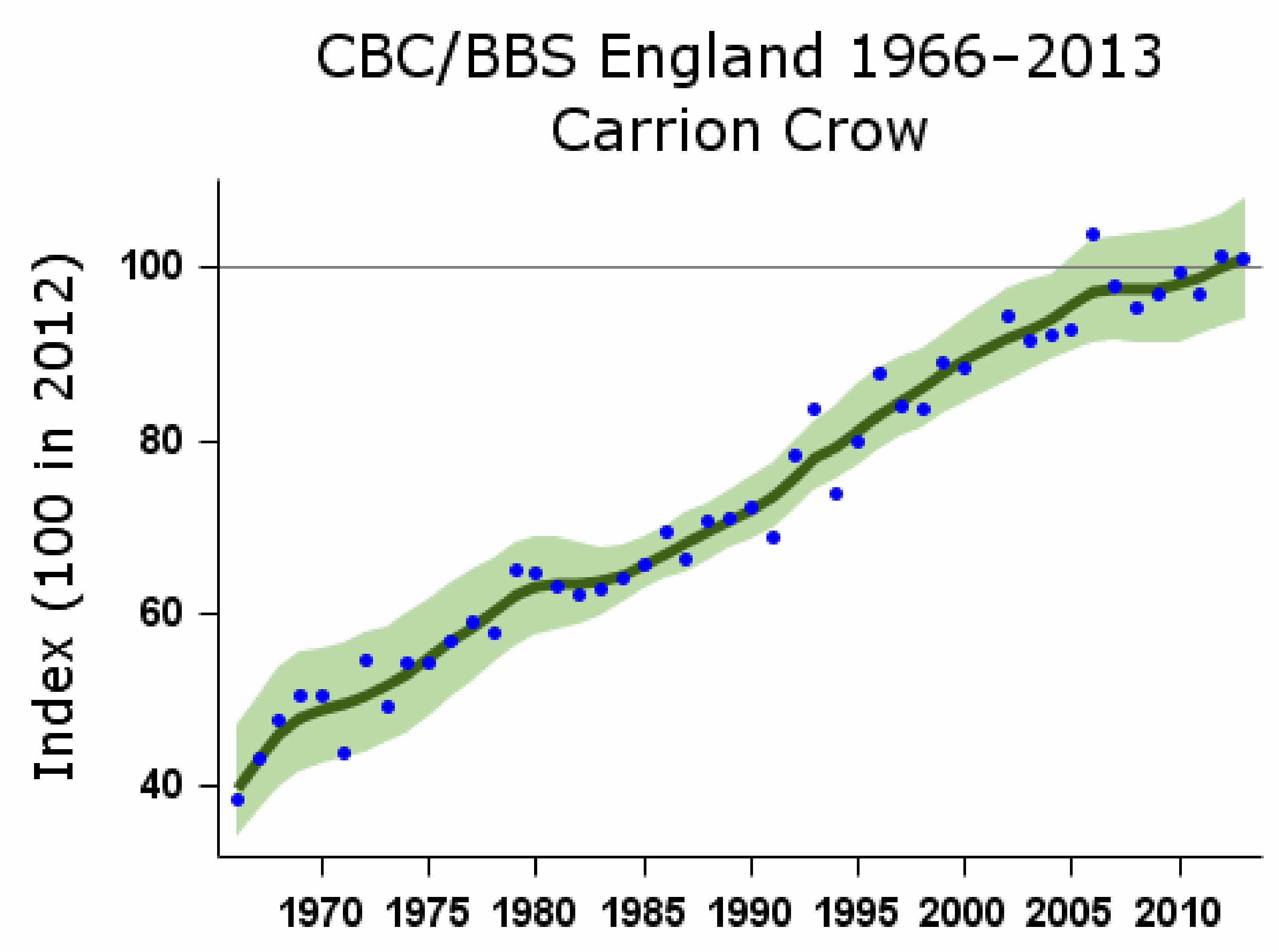
Key facts

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 increased consistently since the 1960s (Gregory & Marchant 1996) and reached a plateau around the turn of the century. Since then the BBS has recorded ongoing steep increase in England offset by stability or minor decrease in Scotland and Wales. The BBS PECBMS 2014a).



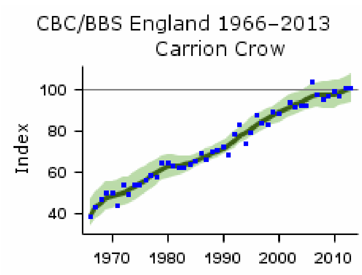
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

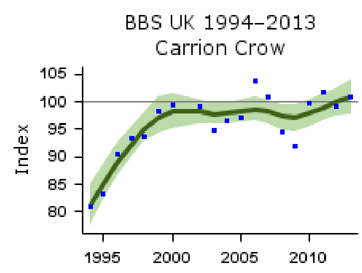
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	45	1967-2012	874	132	84	193		Includes Hooded Crow
	25	1987-2012	1462	47	33	61		Includes Hooded Crow
	10	2002-2012	2242	9	2	16		Includes Hooded Crow
	5	2007-2012	2544	2	-1	6		
BBS UK	17	1995-2012	2386	17	10	25		
	10	2002-2012	2707	2	-3	7		
	5	2007-2012	3047	2	-1	6		
BBS England	17	1995-2012	1971	25	17	33		
	10	2002-2012	2242	9	2	15		
	5	2007-2012	2544	2	-1	7		
BBS Scotland	17	1995-2012	197	1	-15	19		
	10	2002-2012	219	-9	-25	11		
	5	2007-2012	256	-4	-14	8		
BBS Wales	17	1995-2012	204	15	0	30		
	10	2002-2012	228	-3	-14	9		
	5	2007-2012	227	1	-11	13		

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

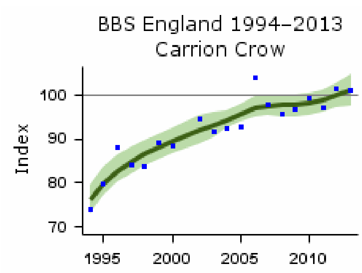
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



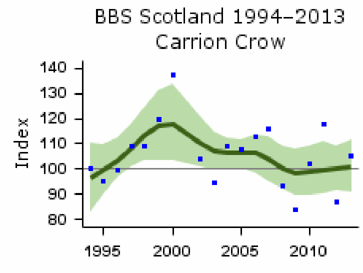
CBC/BBS England graph



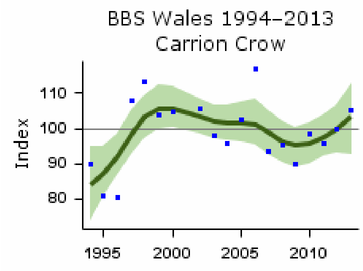
BBS UK graph



BBS England graph

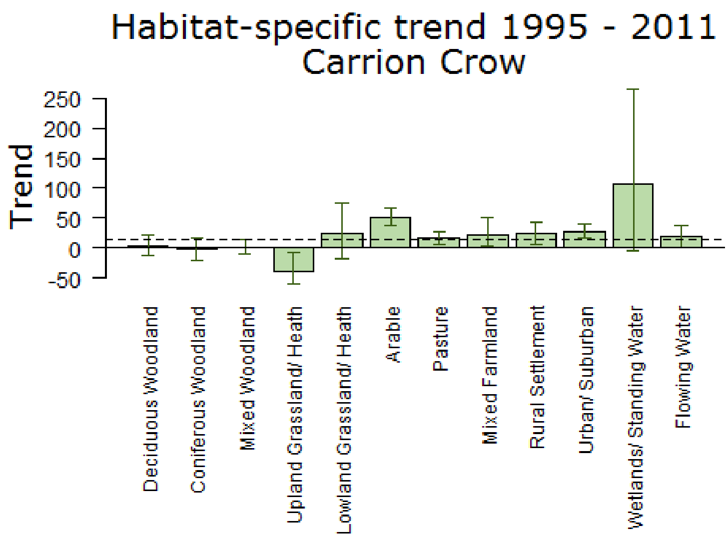


BBS Scotland graph



BBS Wales graph

Population trends by habitat



Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

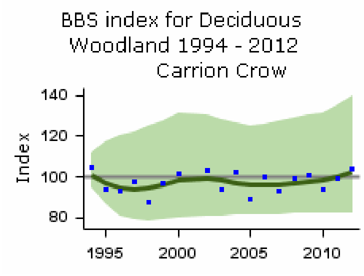
Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

More on habitat trends

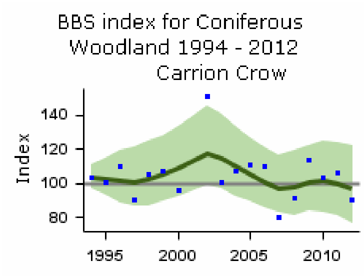
Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	621	3	-12	22
Coniferous Woodland	16	1995-2011	136	-2	-21	18
Mixed Woodland	16	1995-2011	314	1	-11	14
Upland Grassland/ Heath	16	1995-2011	54	-38	-60	-7
Lowland Grassland/ Heath	16	1995-2011	138	24	-19	76
Arable	16	1995-2011	611	51	38	67
Pasture	16	1995-2011	1119	16	6	27
Mixed Farmland	16	1995-2011	568	23	3	52
Rural Settlement	16	1995-2011	629	24	6	43
Urban/ Suburban	16	1995-2011	367	27	16	42

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Wetlands/ Standing Water	16	1995-2011	78	106	-5	265
Flowing Water	16	1995-2011	398	19	0	37

Further information on habitat-specific trends, please follow link here.



Habitat graph



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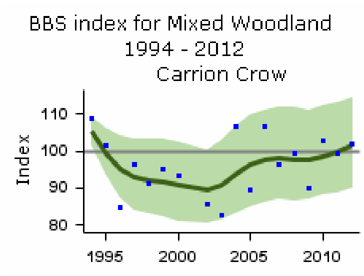

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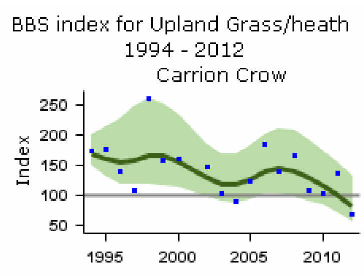

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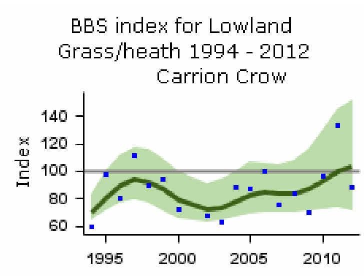

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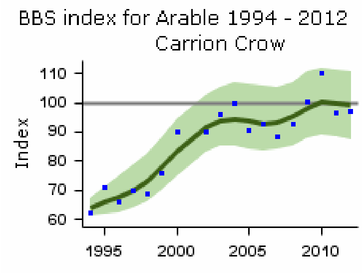

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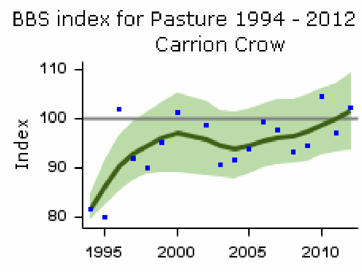

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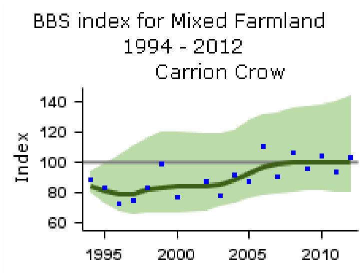
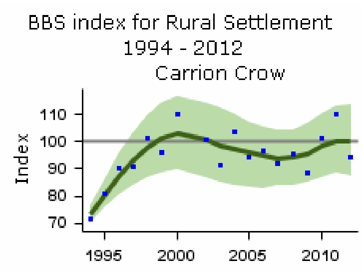
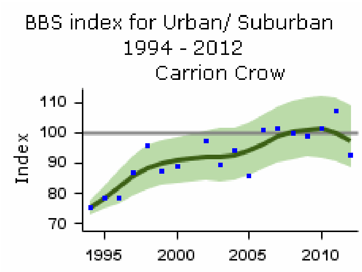


Habitat graph



Habitat graph



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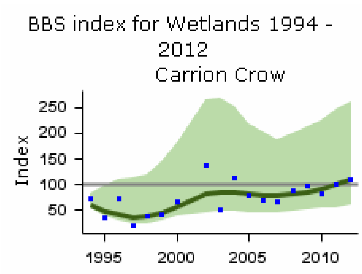

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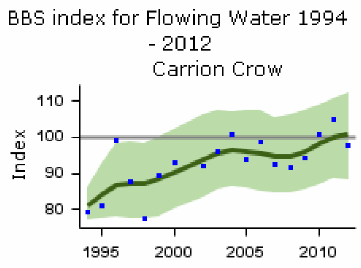
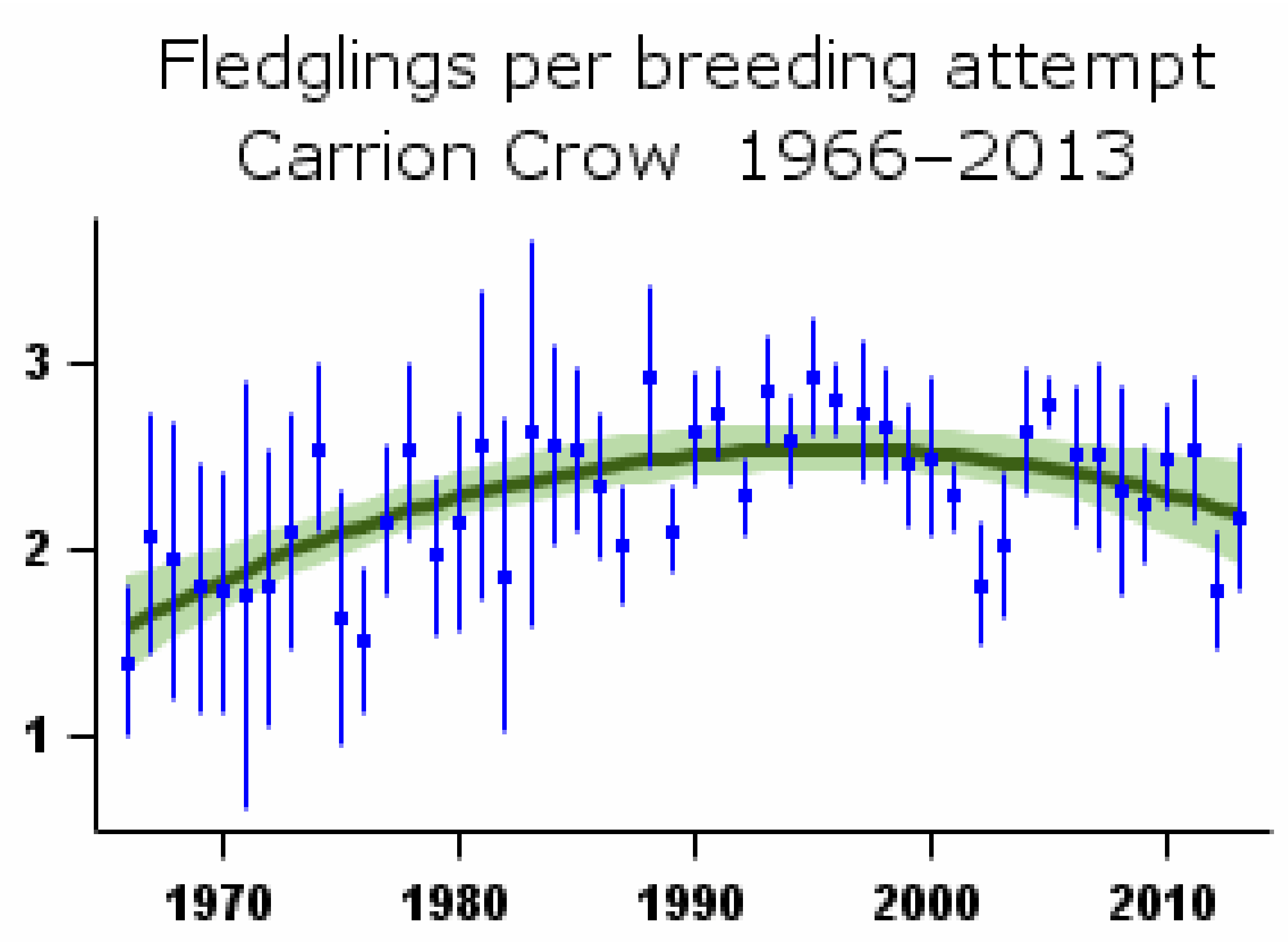
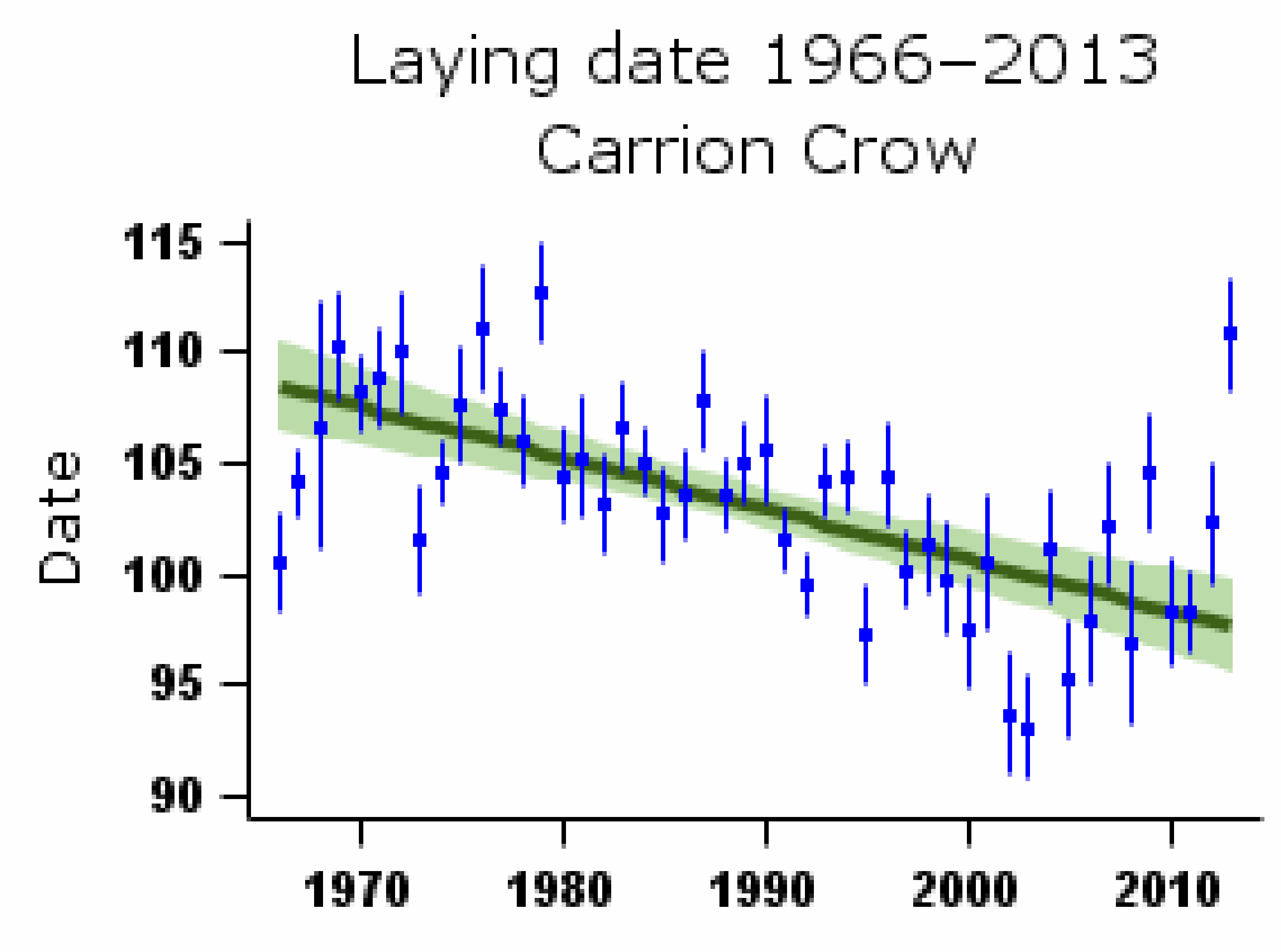


Habitat graph

Demographic trends



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

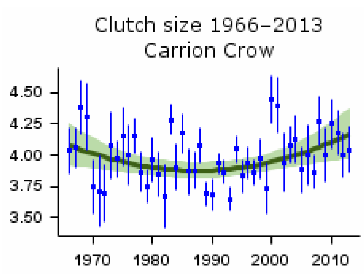


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

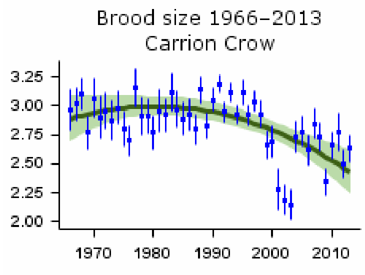
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	40	Curvilinear	1.71 fledglings	2.22 fledglings	29.9%		
Clutch size	44	1968-2012	32	Curvilinear	4.05 eggs	4.15 eggs	2.5%		
Brood size	44	1968-2012	79	Curvilinear	2.92 chicks	2.46 chicks	-15.7%		
Nest failure rate at egg stage	44	1968-2012	48	Curvilinear	1.89% nests/day	0.40% nests/day	-78.8%		
Nest failure rate at chick stage	44	1968-2012	41	Linear decline	0.72% nests/day	0.11% nests/day	-84.7%		
Laying date	44	1968-2012	30	Linear decline	Apr 18	Apr 8	-10 days		Small sample

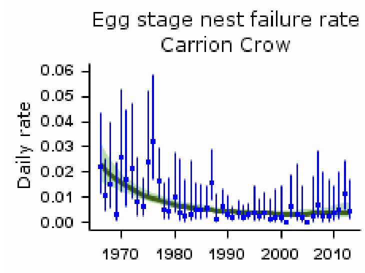
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



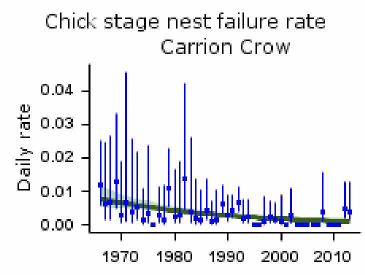
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



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 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 strong 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 stages. Clutch size has increased, but brood size has decreased. 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 what part this has played.

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 territories year-round. 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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Hooded Crow

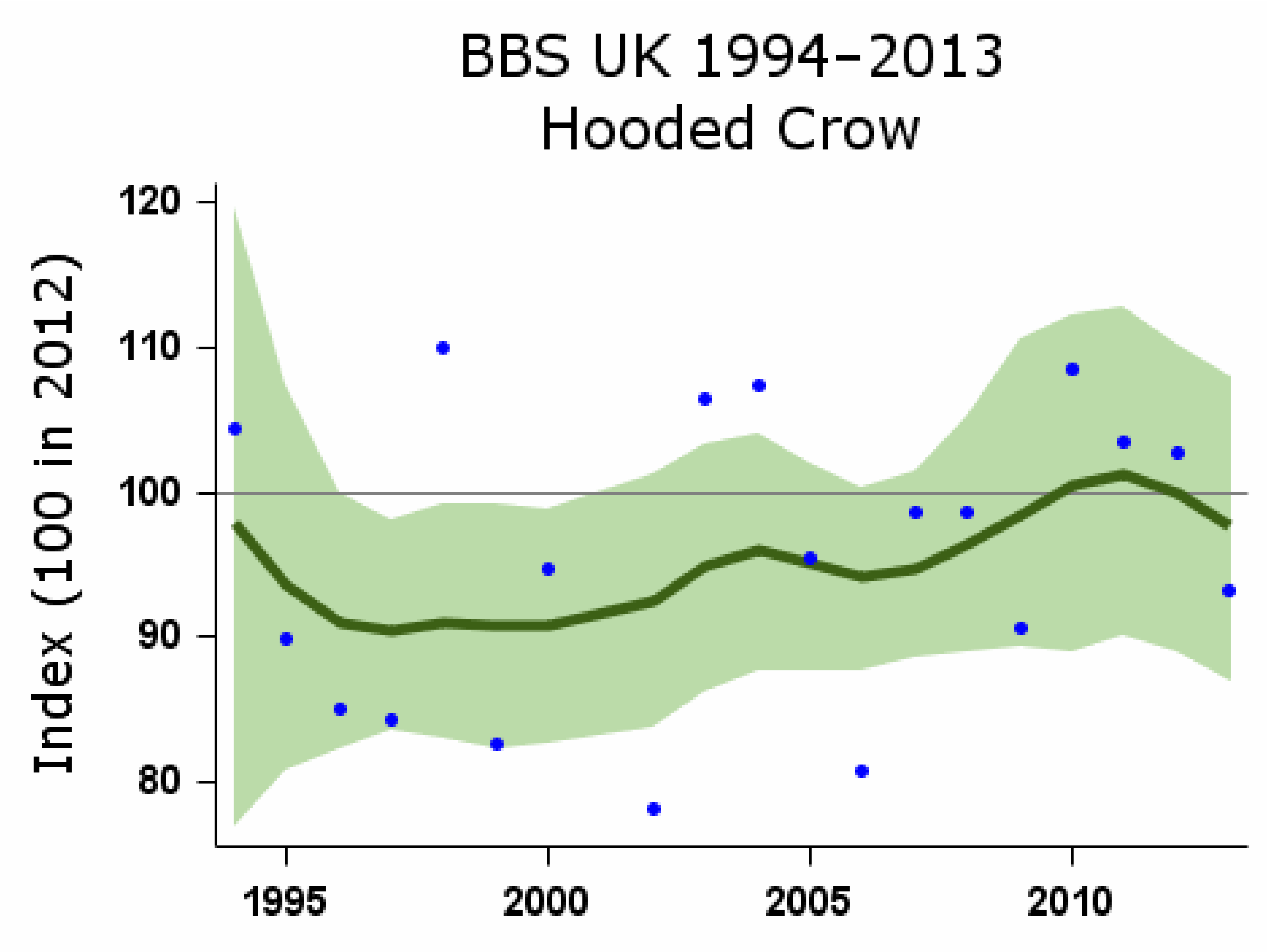
Corvus cornix

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 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 have always recorded 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). The 2007-11 Atlas records little change in the distribution of Hooded Crows but further incursion of Carrion Crows into northwest Scotland and eastern Ireland (Balmer et al. 2013).



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

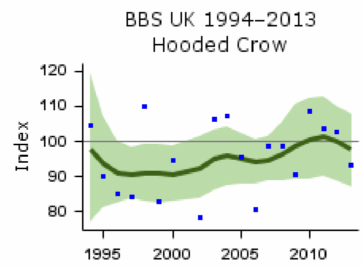
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	17	1995-2012	137	7	-17	39		
	10	2002-2012	151	8	-12	32		
	5	2007-2012	157	6	-6	17		

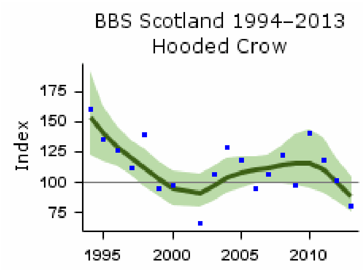
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS Scotland	17	1995-2012	52	-29	-48	6		
	10	2002-2012	51	9	-22	55		
	5	2007-2012	54	-11	-23	10		
BBS N.Ireland	17	1995-2012	82	138	78	196		
	10	2002-2012	98	7	-4	24		
	5	2007-2012	102	24	11	41		

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

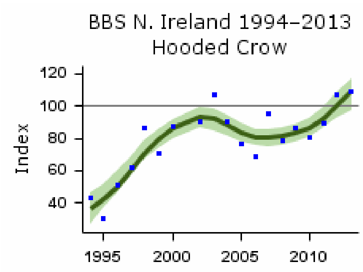
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



BBS UK graph



BBS 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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Raven

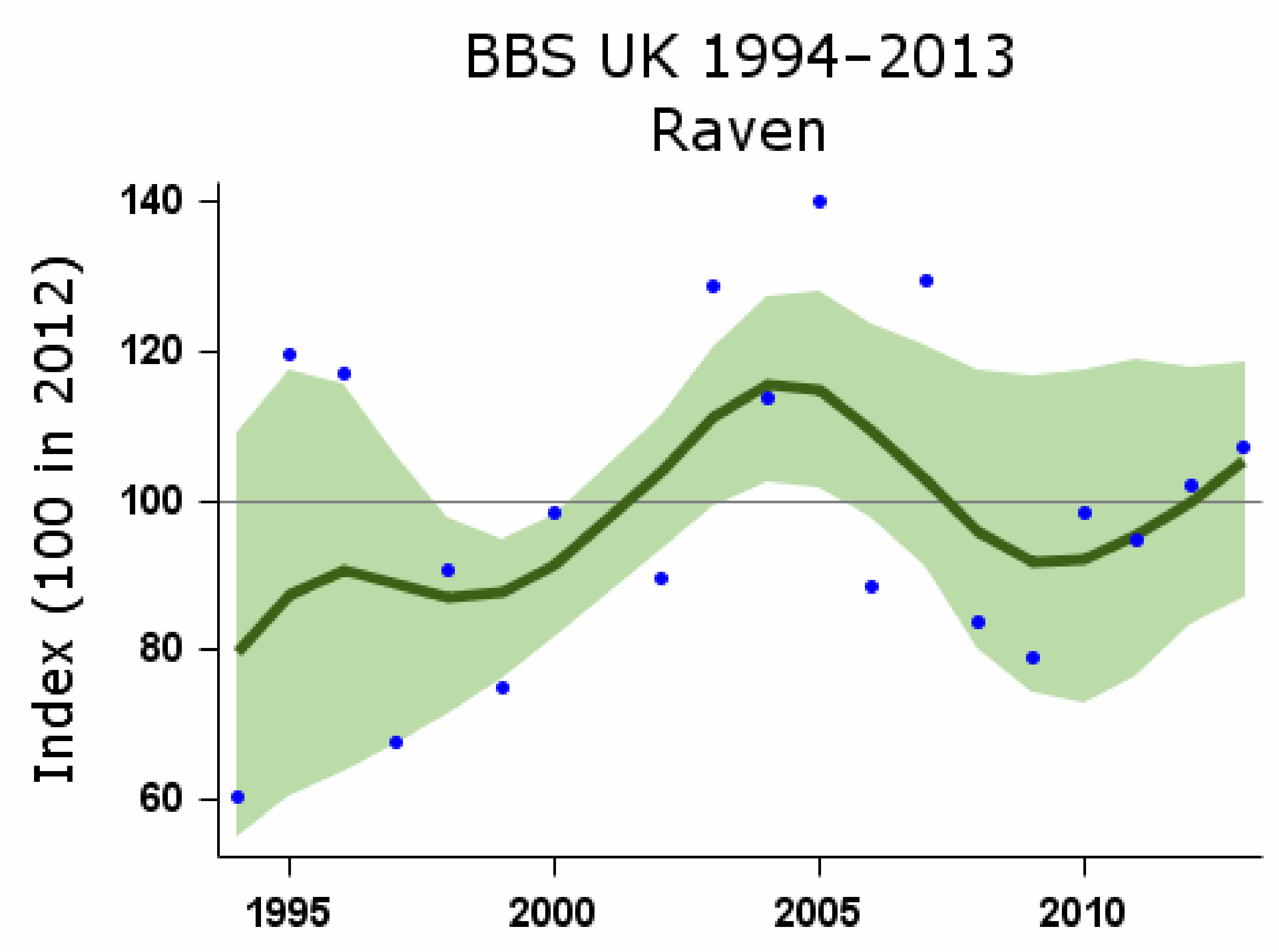
Corvus corax

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 increased along the English-Welsh border and colonised extensive new areas of the south coast, western and midland England and southern Scotland since 1988-91 (Cross 2002, Balmer et al. 2013). BBS indicates overall increase in England, Scotland and Wales since 1994. Nesting success appears to have improved, but brood size has fallen. Ravens have increased markedly across Europe since 1980, though with little change since the early 1990s (PECBMS 2014a): increases are evident in all regions but have been 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	17	1995-2012	295	14	-31	102		
	10	2002-2012	362	-4	-24	25		

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	5	2007-2012	437	-3	-24	14		
BBS England	17	1995-2012	131	8	-50	303		
	10	2002-2012	177	17	-13	97		
	5	2007-2012	238	22	3	46		
BBS Scotland	17	1995-2012	47	36	-10	110		
	10	2002-2012	50	8	-29	62		
	5	2007-2012	60	-10	-45	35		
BBS Wales	17	1995-2012	90	29	-10	88		
	10	2002-2012	104	-15	-32	4		
	5	2007-2012	106	-13	-27	6		

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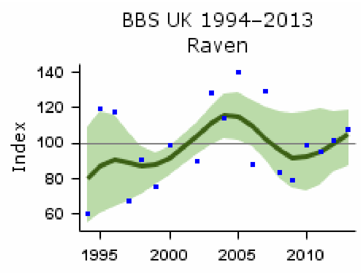
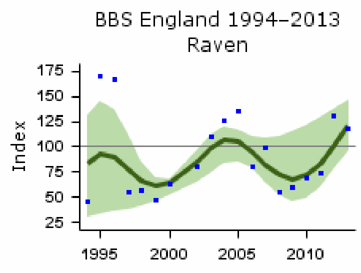
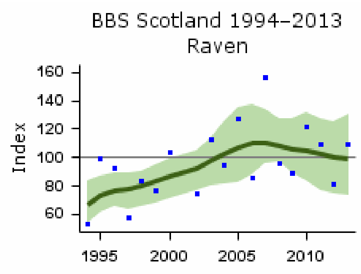


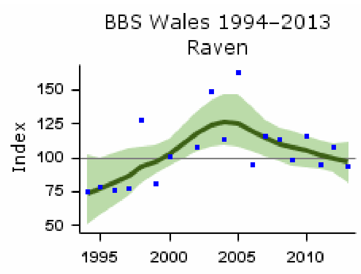
BBS UK graph



BBS England graph

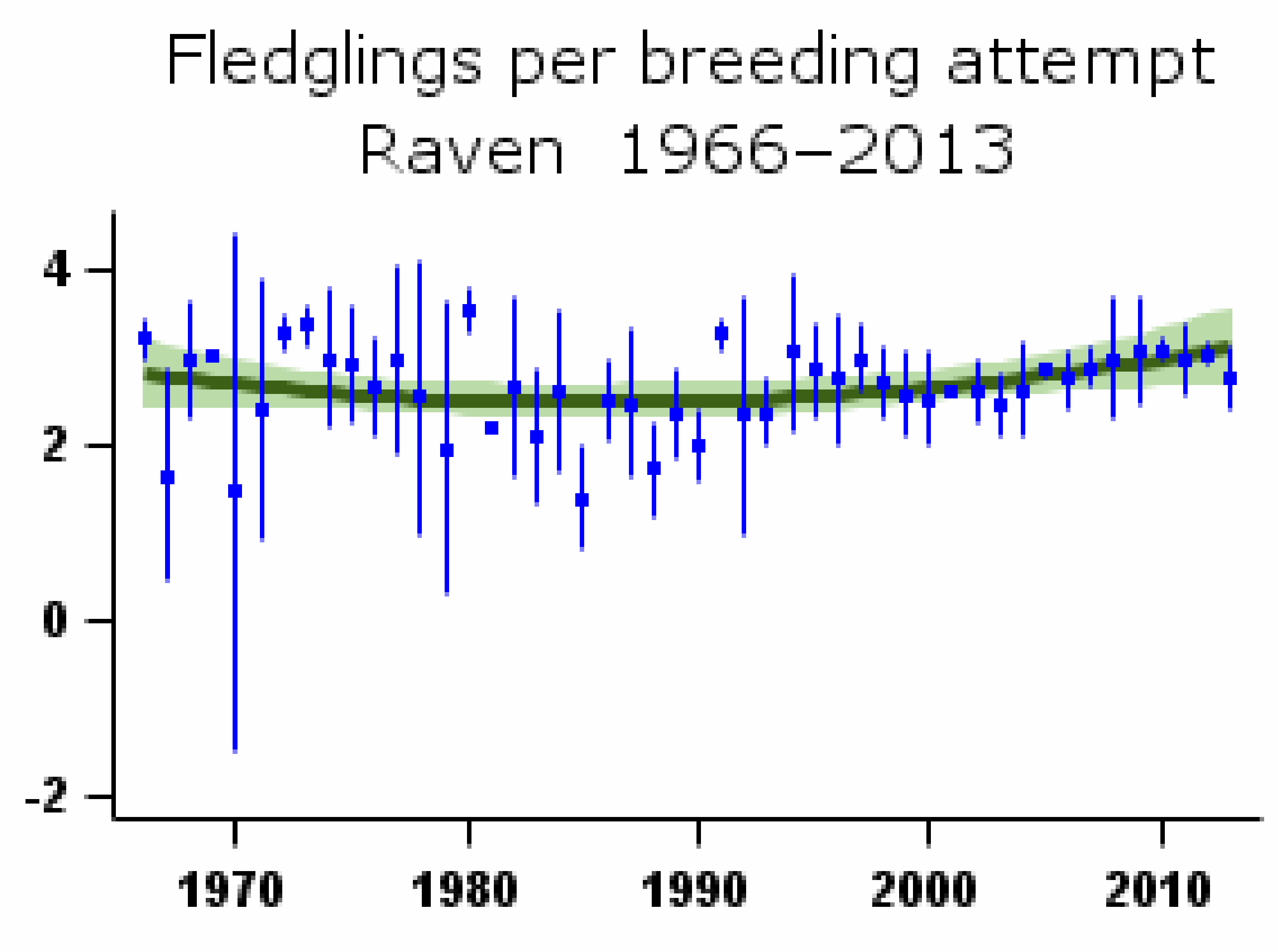


BBS Scotland graph

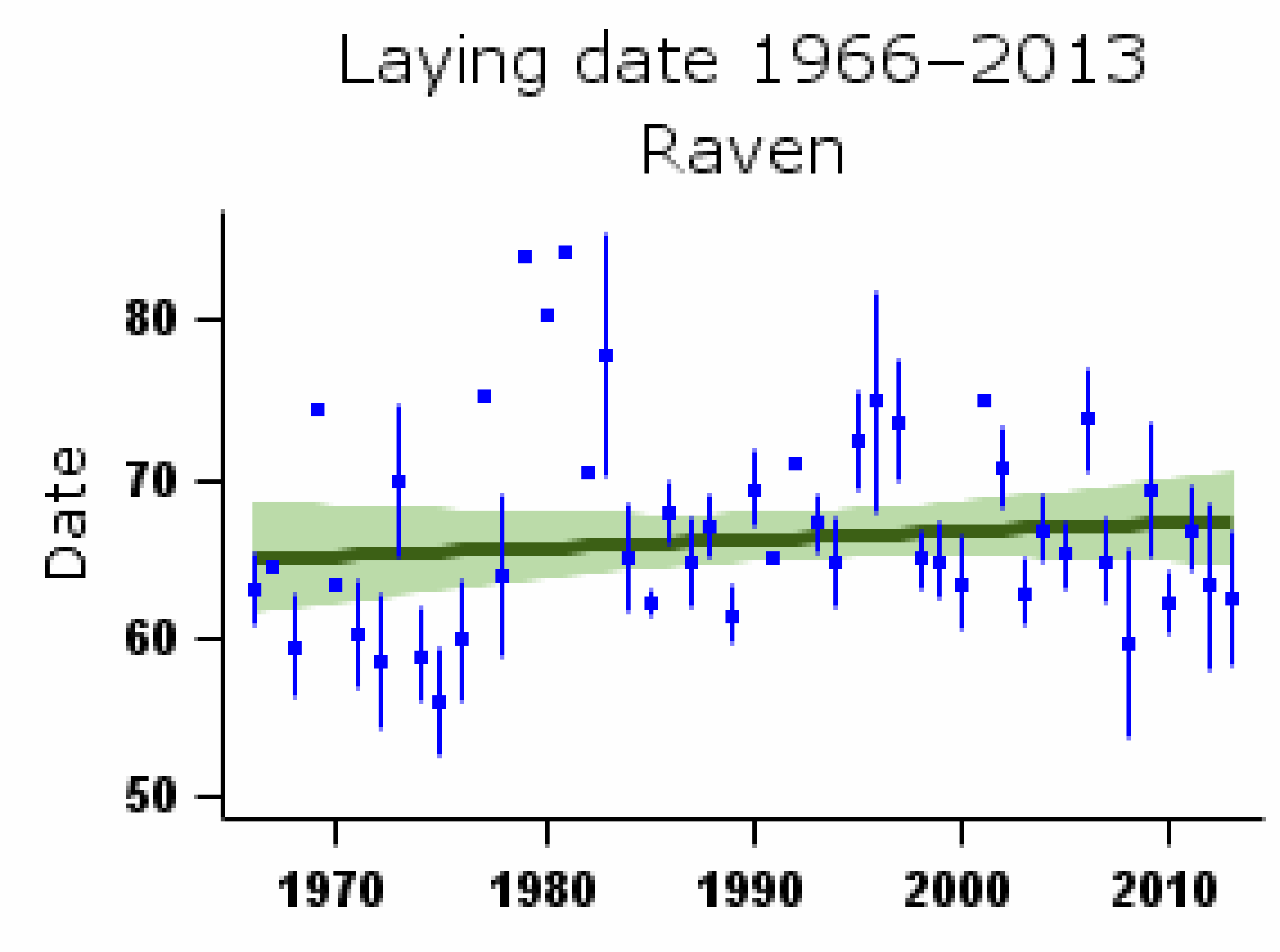


BBS Wales graph

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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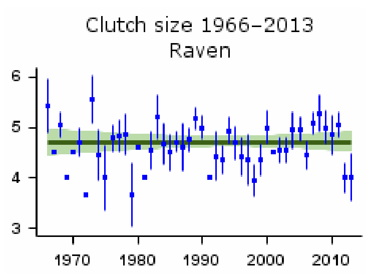
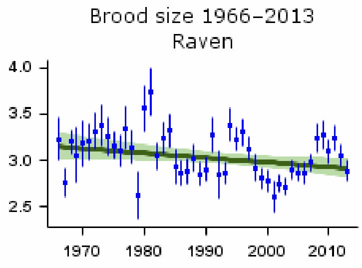
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	22	Curvilinear	2.76 fledglings	3.08 fledglings	11.4%		
Clutch size	44	1968-2012	14	None					Small sample
Brood size	44	1968-2012	70	Linear decline	3.14 chicks	2.92 chicks	-7.0%		
Nest failure rate at egg stage	44	1968-2012	22	Curvilinear	0.26% nests/day	0.03% nests/day	-88.5%		Small sample
Nest failure rate at chick stage	44	1968-2012	31	None					
Laying date	44	1968-2012	12	None			0 days		Small sample

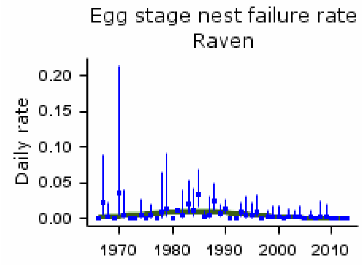
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



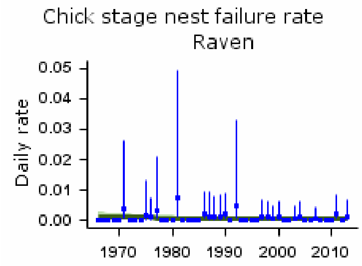
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



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

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Goldcrest

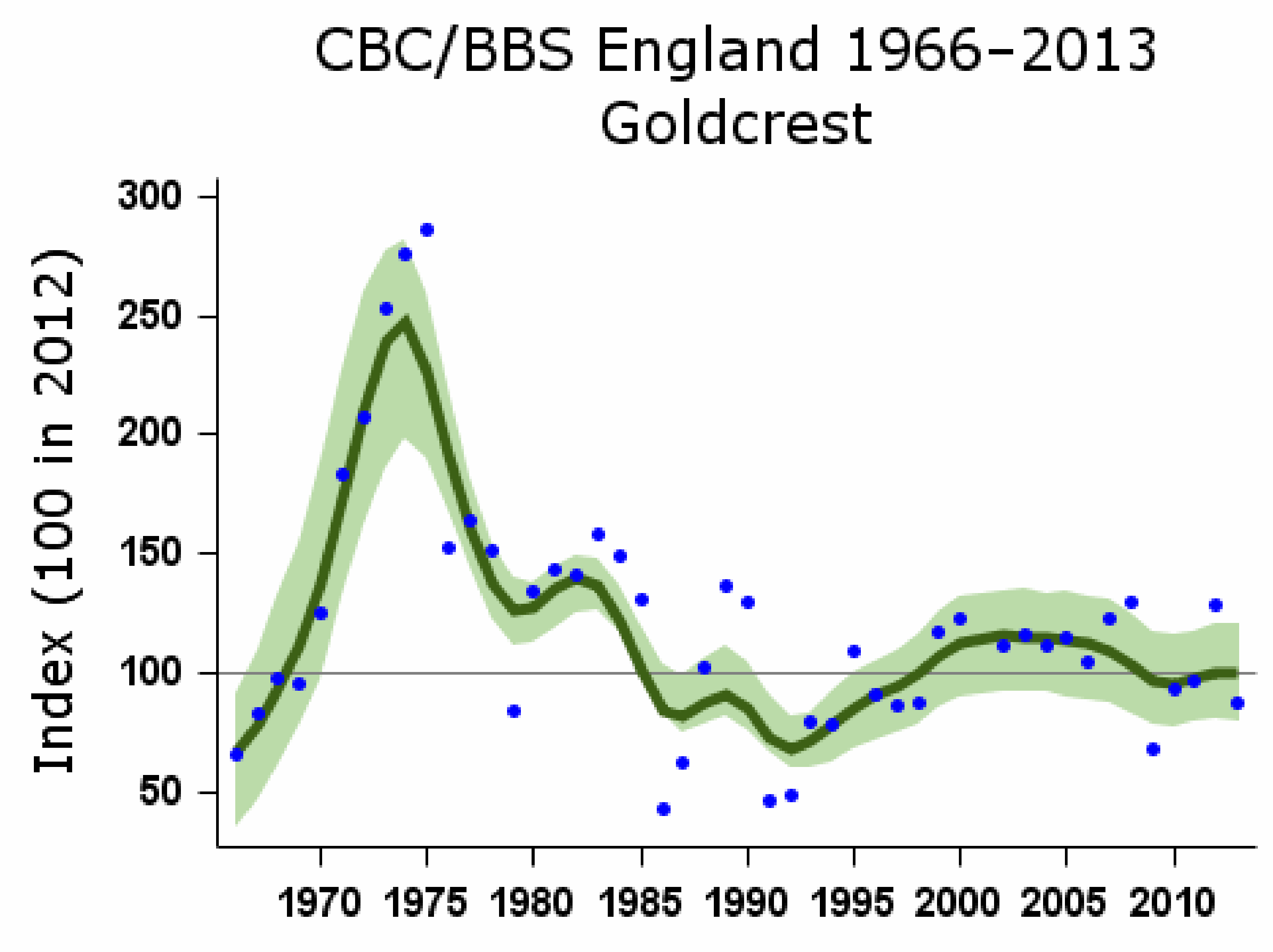
Regulus regulus

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 affected unusually severely 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 some initial increase in all UK countries, followed by a long decline that ended around 2010. The BBS PECBMS 2014a).



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

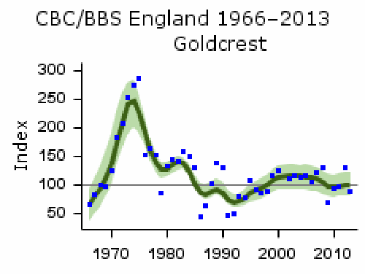
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	45	1967-2012	274	27	-25	163		
	25	1987-2012	428	23	-11	47		
	10	2002-2012	656	-14	-21	-3		
	5	2007-2012	711	-9	-14	-1		

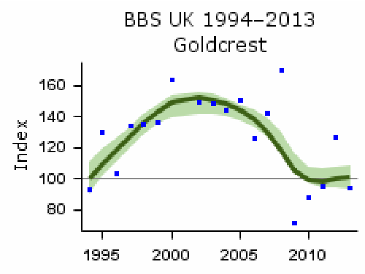
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	17	1995-2012	784	-9	-19	5		
	10	2002-2012	905	-34	-40	-24	>25	
	5	2007-2012	975	-23	-30	-18		
BBS England	17	1995-2012	559	13	1	31		
	10	2002-2012	656	-14	-21	-4		
	5	2007-2012	711	-8	-14	-2		
BBS Scotland	17	1995-2012	93	-4	-31	22		
	10	2002-2012	104	-52	-64	-38	>50	
	5	2007-2012	118	-35	-51	-26	>25	
BBS Wales	17	1995-2012	82	-52	-64	-28	>50	
	10	2002-2012	89	-42	-54	-26	>25	
	5	2007-2012	85	-21	-38	3		
BBS N.Ireland	17	1995-2012	45	14	-28	33		
	10	2002-2012	52	-35	-45	-15	>25	
	5	2007-2012	57	-43	-55	-36	>25	

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

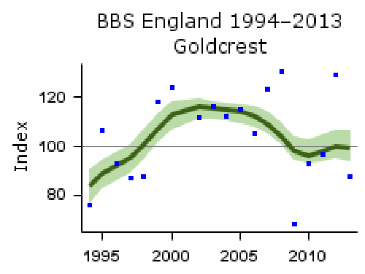
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



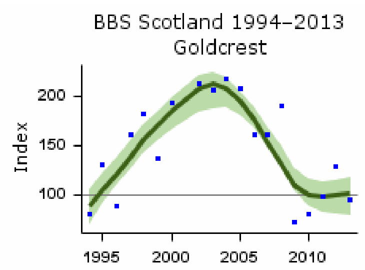
CBC/BBS England graph



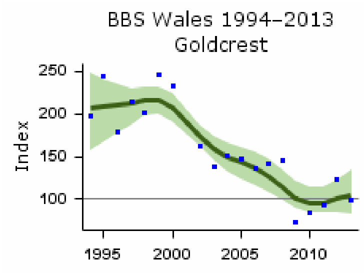
BBS UK graph



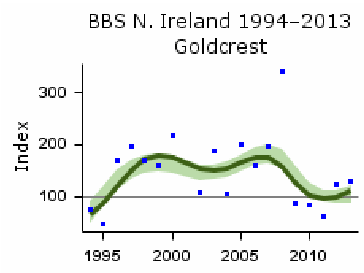
BBS England graph



BBS Scotland graph

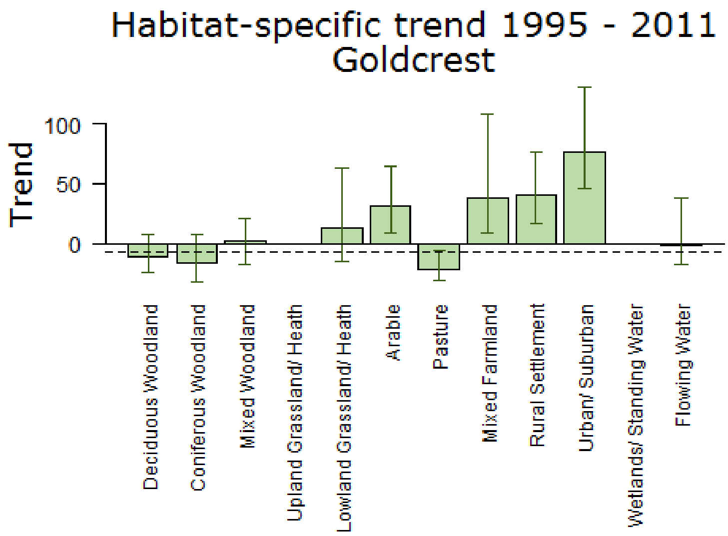


BBS Wales graph



BBS N.Ireland graph

Population trends by habitat



Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

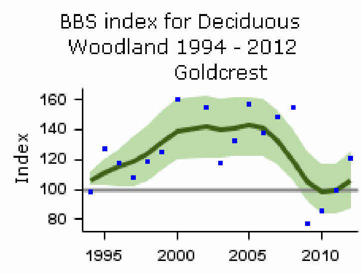
Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

More on habitat trends

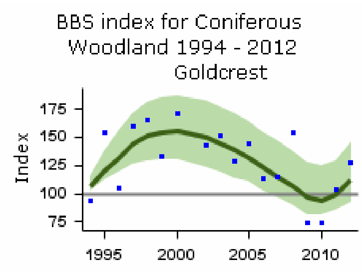
Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	189	-10	-24	8
Coniferous Woodland	16	1995-2011	152	-17	-32	7
Mixed Woodland	16	1995-2011	207	2	-17	21
Lowland Grassland/ Heath	16	1995-2011	45	13	-15	63
Arable	16	1995-2011	102	31	9	65
Pasture	16	1995-2011	273	-22	-31	-5
Mixed Farmland	16	1995-2011	65	38	9	109
Rural Settlement	16	1995-2011	164	41	17	77

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Urban/ Suburban	16	1995-2011	82	76	46	131
Flowing Water	16	1995-2011	89	-1	-18	38

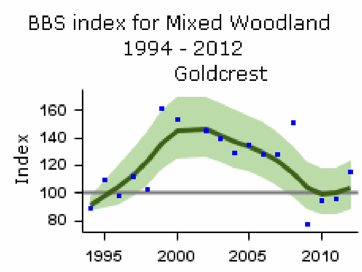
Further information on habitat-specific trends, please follow link here.



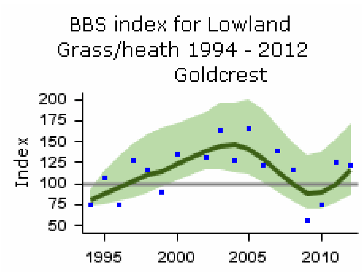
Habitat graph



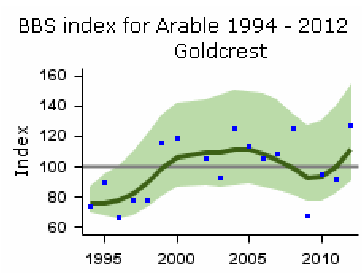
Habitat graph



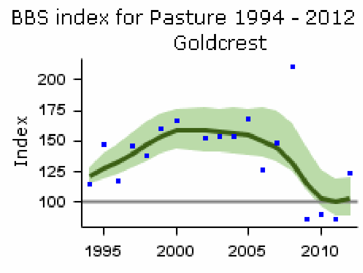
Habitat graph



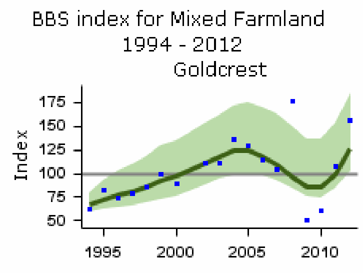
Habitat graph



Habitat graph



Habitat graph



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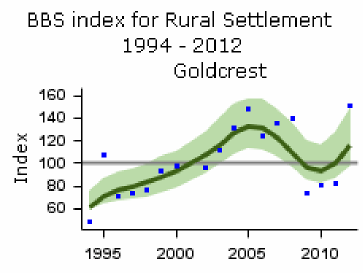
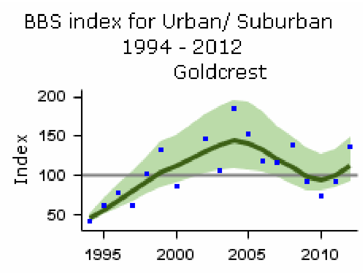
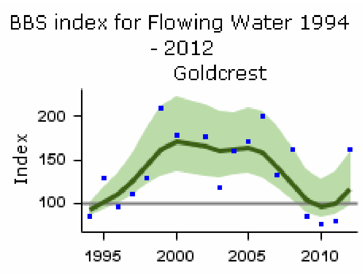


Habitat graph



Habitat graph



Habitat graph

Demographic trends

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

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Blue Tit

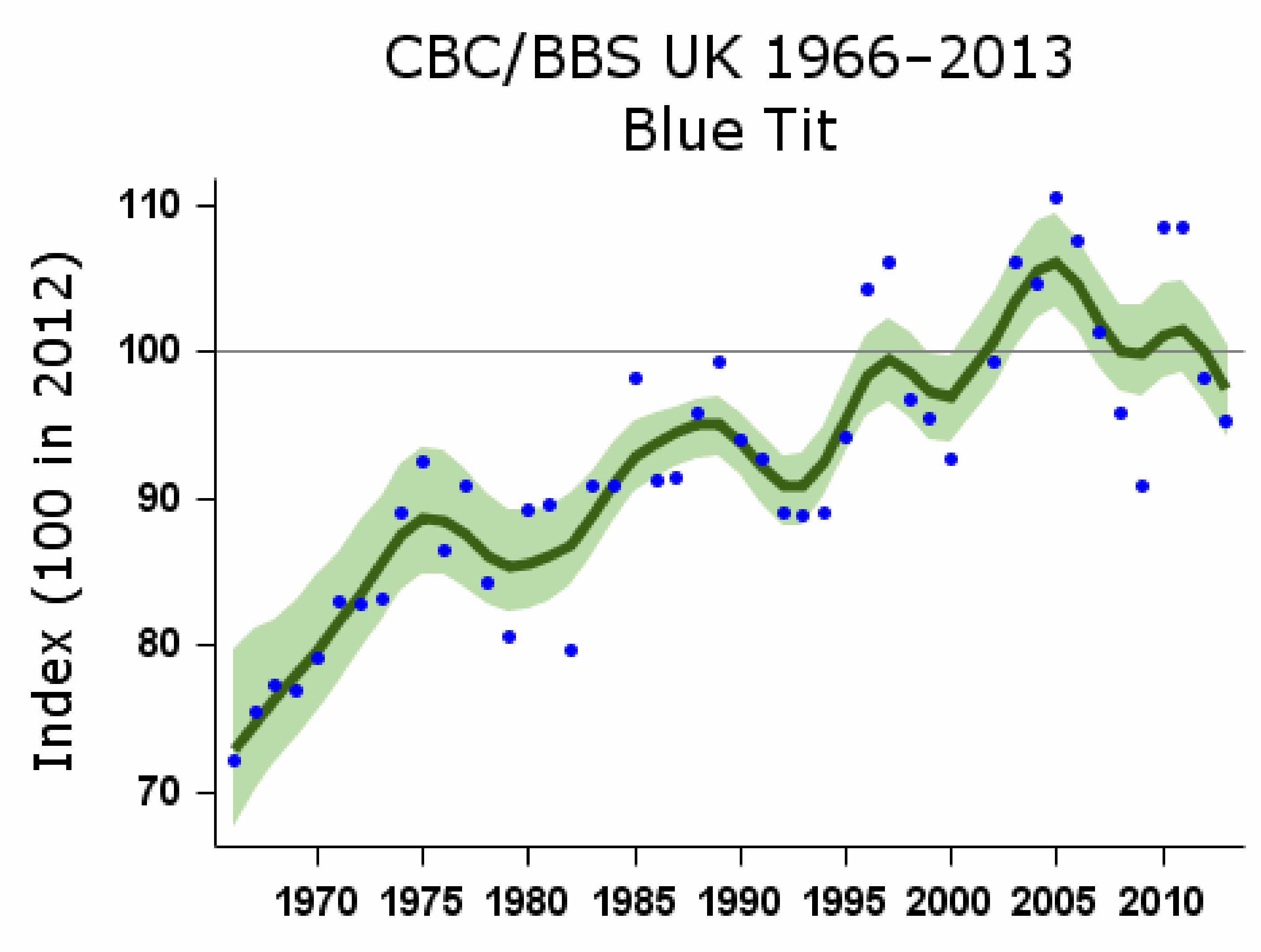
Cyanistes caeruleus

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, with brief pauses in the long-term upward trend. The recent years of the CBC/BBS index show fluctuations and now a possible decrease. The BBS Robinson et al. 2014). Food provision in gardens during winter and availability of nest boxes, which may reduce egg and nestling predation, have both increased and may have contributed to the rise in population. There have been no clear changes in fledglings per breeding attempt or in survival, however, to accompany the population increase. First-egg dates have advanced by over a week since 1968. Numbers have shown widespread moderate increase across Europe since 1980 (PECBMS 2014a).



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

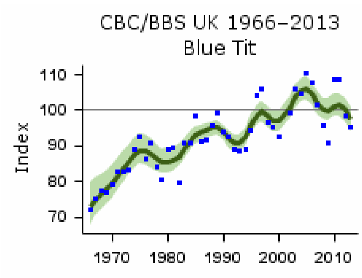
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	45	1967-2012	1071	34	19	49		
	25	1987-2012	1753	6	1	11		
	10	2002-2012	2644	-1	-3	2		
	5	2007-2012	2943	-2	-5	0		

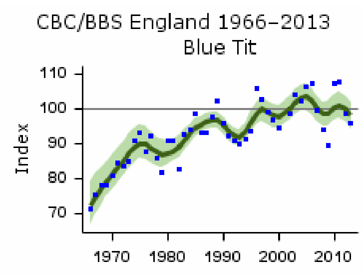
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	45	1967-2012	879	34	17	50		
	25	1987-2012	1432	4	2	10		
	10	2002-2012	2144	0	-3	2		
	5	2007-2012	2405	0	-2	2		
CES adults	28	1984-2012	100	14	-3	41		
	25	1987-2012	106	17	1	34		
	10	2002-2012	108	2	-7	12		
	5	2007-2012	107	8	1	17		
CES juveniles	28	1984-2012	100	-30	-51	-1	>25	
	25	1987-2012	106	-27	-44	1		
	10	2002-2012	108	-27	-37	-14	>25	
	5	2007-2012	107	9	-4	25		
BBS UK	17	1995-2012	2336	5	2	8		
	10	2002-2012	2644	0	-4	2		
	5	2007-2012	2943	-2	-4	0		
BBS England	17	1995-2012	1899	4	0	8		
	10	2002-2012	2144	0	-2	3		
	5	2007-2012	2405	0	-2	2		
BBS Scotland	17	1995-2012	169	5	-8	15		
	10	2002-2012	193	-3	-15	9		
	5	2007-2012	227	-6	-14	2		
BBS Wales	17	1995-2012	179	11	-1	24		
	10	2002-2012	202	2	-8	13		
	5	2007-2012	200	-3	-11	5		
BBS N.Ireland	17	1995-2012	78	0	-29	23		
	10	2002-2012	92	-15	-23	-6		
	5	2007-2012	96	-19	-26	-14		

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

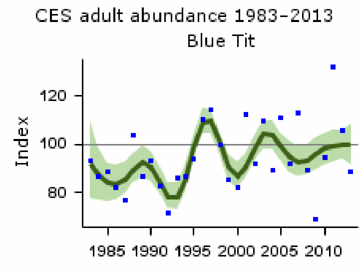
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



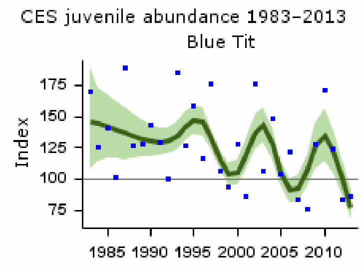
CBC/BBS UK graph



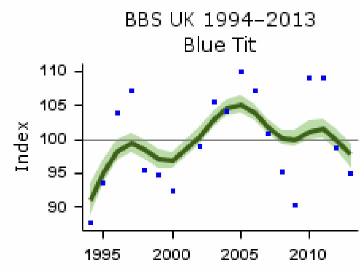
CBC/BBS England graph



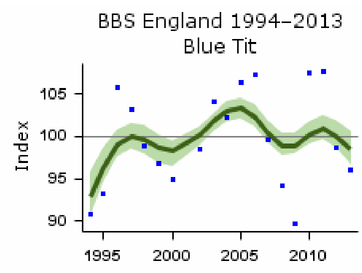
CES adults graph



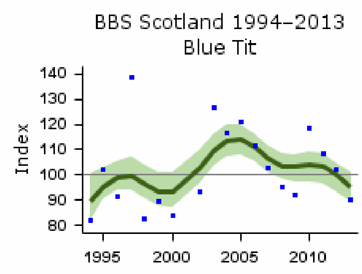
CES juveniles graph



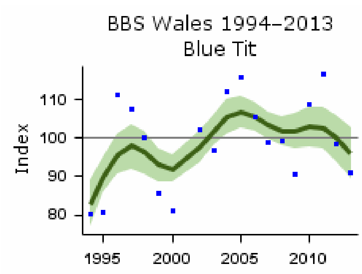
BBS UK graph



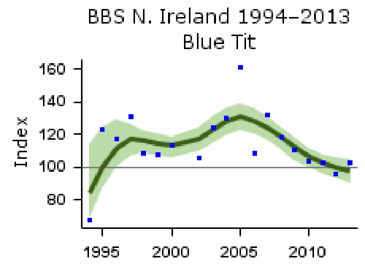
BBS England graph



BBS Scotland graph

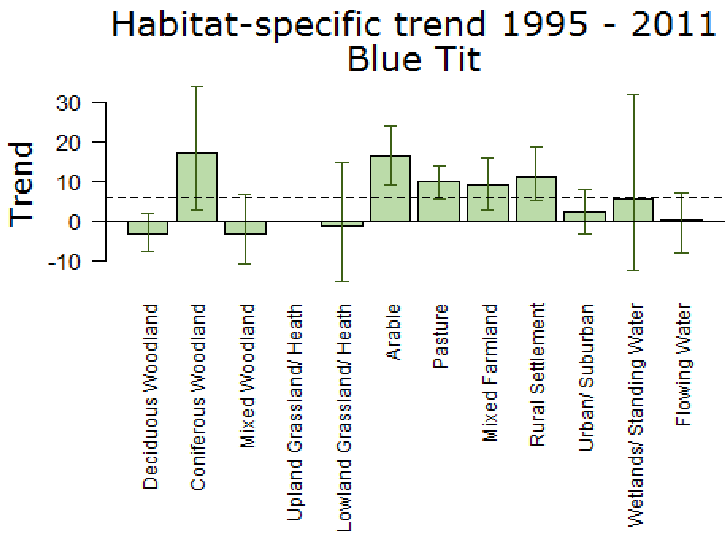


BBS Wales graph



BBS N.Ireland graph

Population trends by habitat



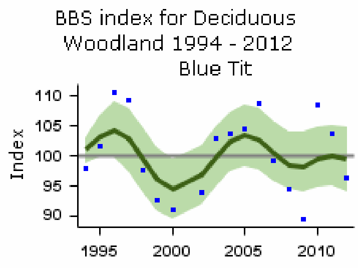
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

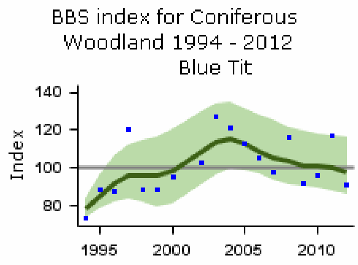
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	877	-3	-8	2
Coniferous Woodland	16	1995-2011	169	17	3	34
Mixed Woodland	16	1995-2011	459	-3	-11	7
Lowland Grassland/ Heath	16	1995-2011	141	-1	-15	15
Arable	16	1995-2011	722	16	9	24
Pasture	16	1995-2011	1260	10	6	14
Mixed Farmland	16	1995-2011	677	9	3	16
Rural Settlement	16	1995-2011	842	11	5	19
Urban/ Suburban	16	1995-2011	434	2	-3	8
Wetlands/ Standing Water	16	1995-2011	97	6	-12	32
Flowing Water	16	1995-2011	501	0	-8	7

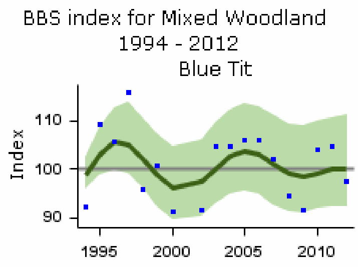
Further information on habitat-specific trends, please follow link here.



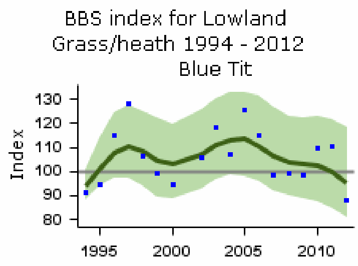
Habitat graph



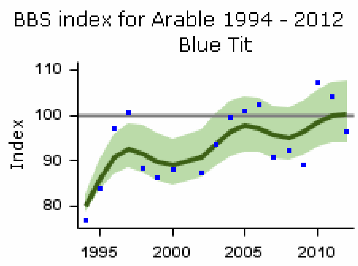
Habitat graph



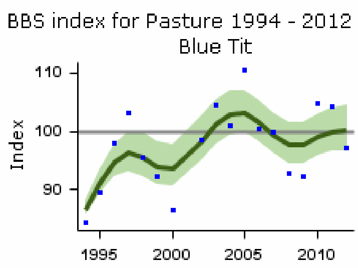
Habitat graph



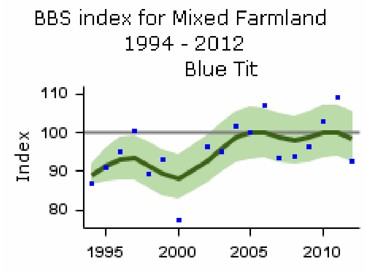
Habitat graph



Habitat graph



Habitat graph



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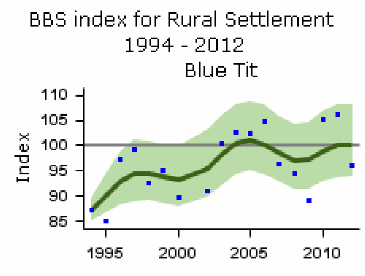
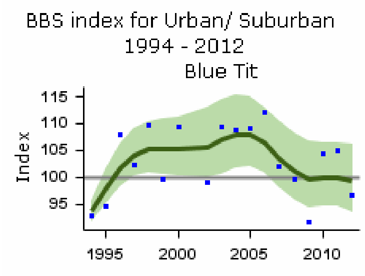


Habitat graph



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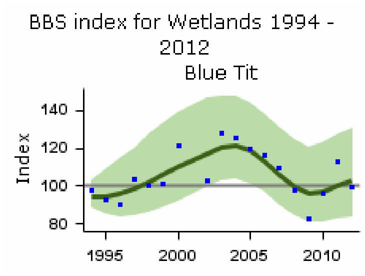
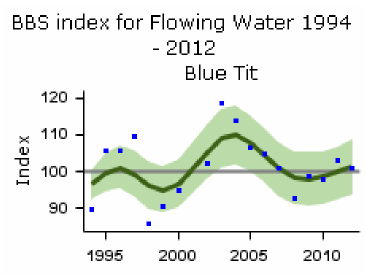
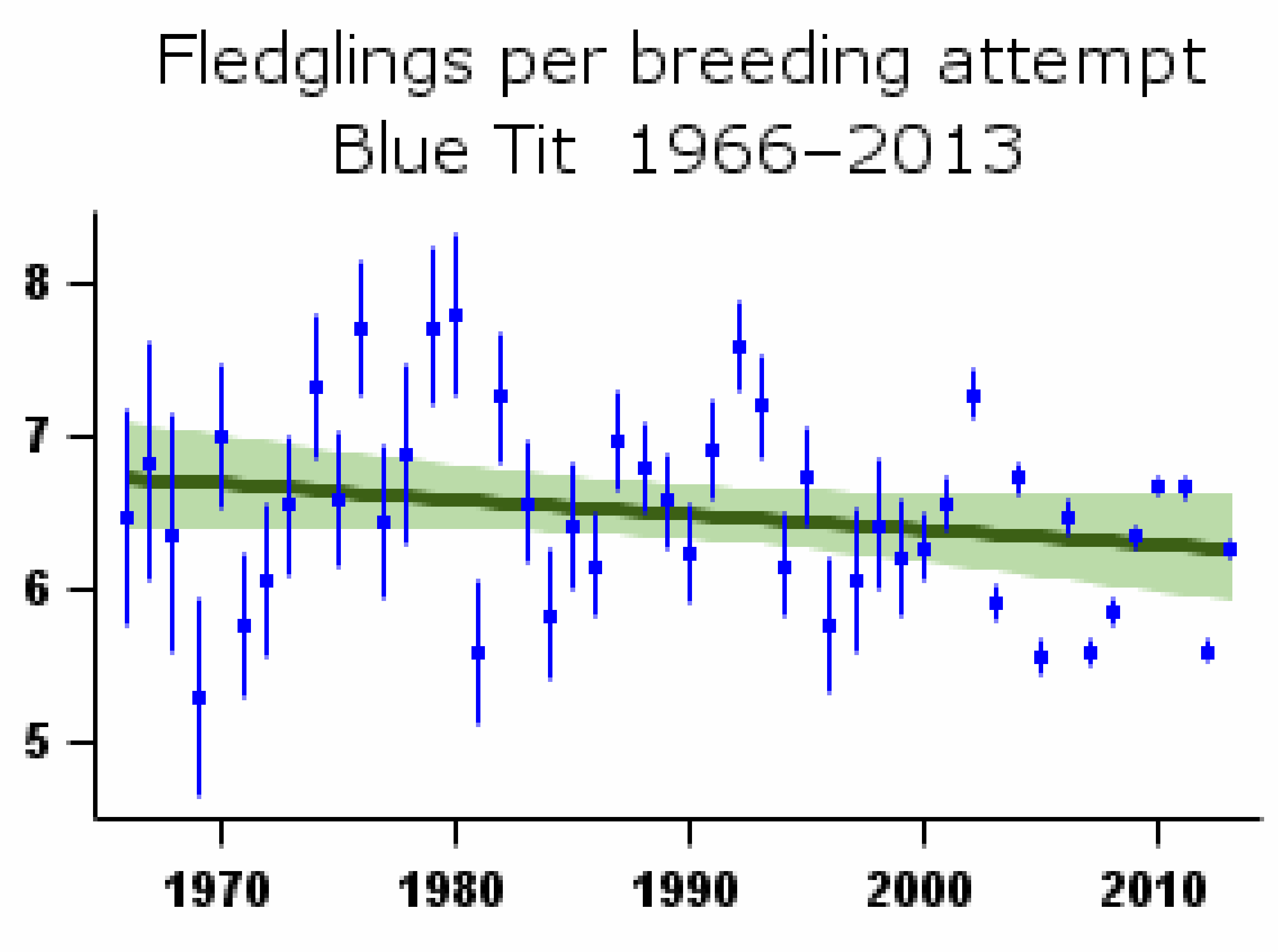


Habitat graph

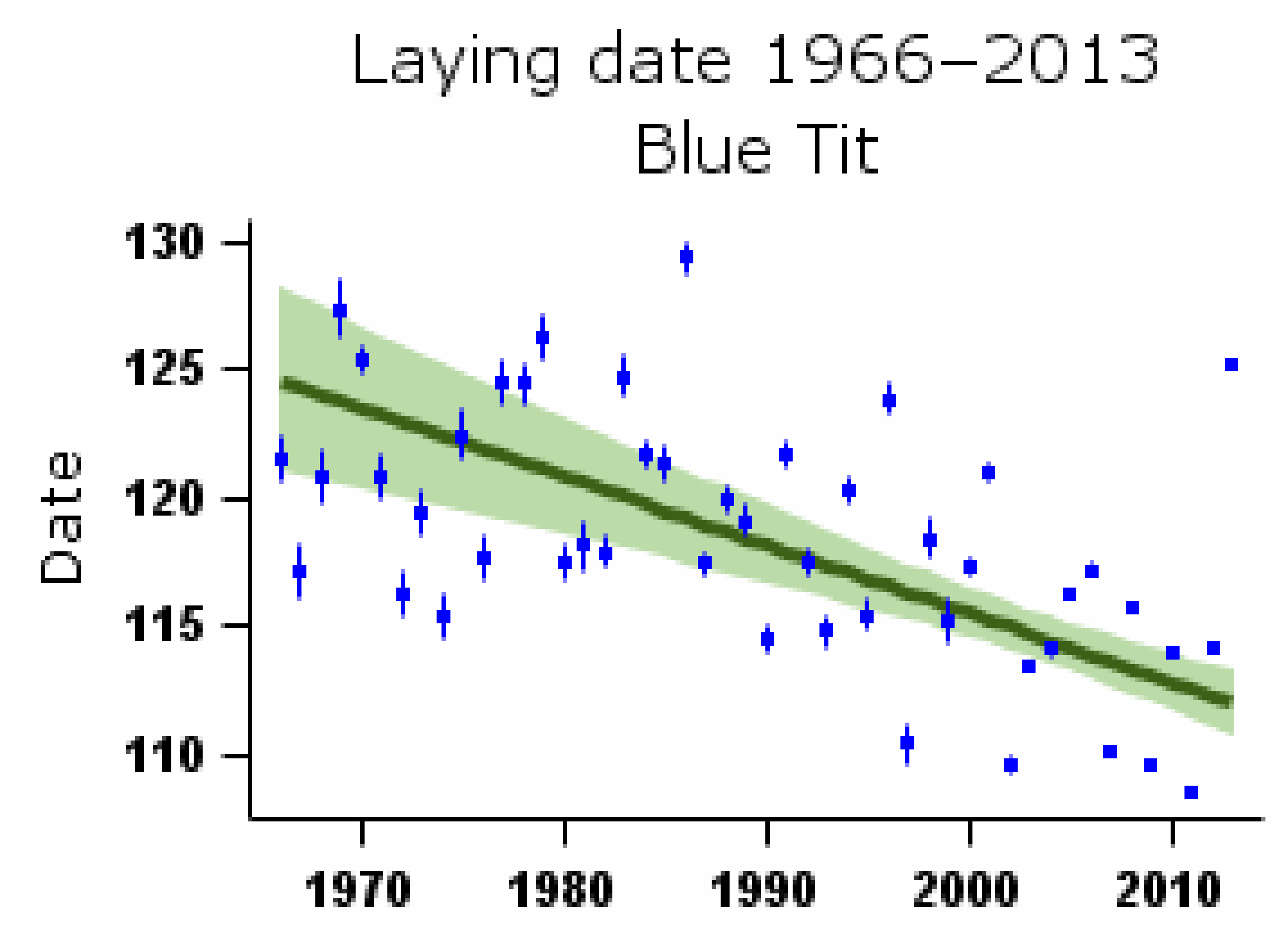


Habitat graph

Demographic trends



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

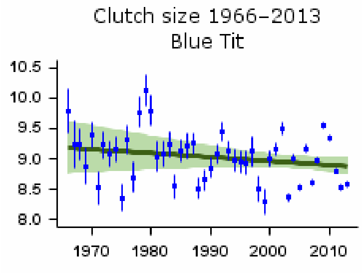


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

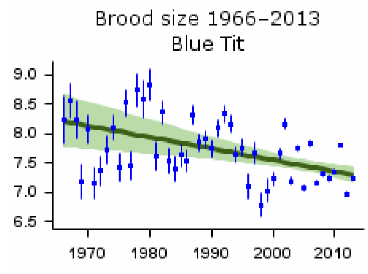
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	545	None					
Clutch size	44	1968-2012	455	None					
Brood size	44	1968-2012	856	Linear decline	8.17 chicks	7.31 chicks	-10.5%		
Nest failure rate at egg stage	44	1968-2012	777	Curvilinear	0.40% nests/day	0.22% nests/day	-45.0%		
Nest failure rate at chick stage	44	1968-2012	546	None					
Laying date	44	1968-2012	569	Linear decline	May 4	Apr 22	-12 days		
Juvenile to Adult ratio (CES)	28	1984-2012	104	Smoothed trend	225 Index value	100 Index value	-56%	>50	
Juvenile to Adult ratio (CES)	25	1987-2012	110	Smoothed trend	192 Index value	100 Index value	-48%	>25	
Juvenile to Adult ratio (CES)	10	2002-2012	112	Smoothed trend	136 Index value	100 Index value	-26%	>25	
Juvenile to Adult ratio (CES)	5	2007-2012	111	Smoothed trend	94 Index value	100 Index value	7%		

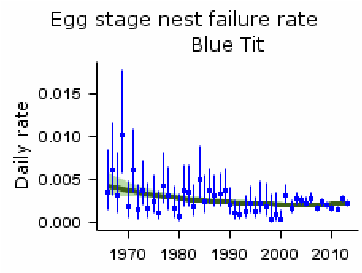
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



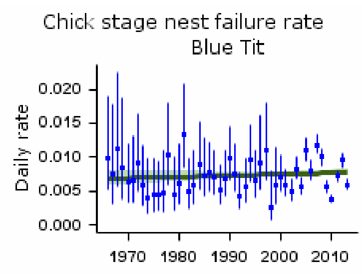
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



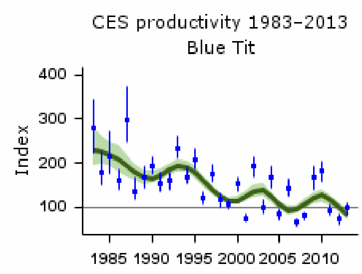
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



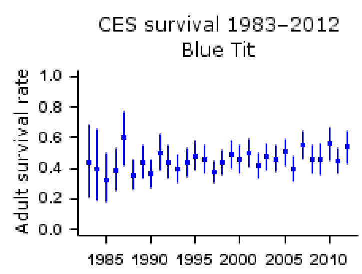
Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Great Tit

Parus major

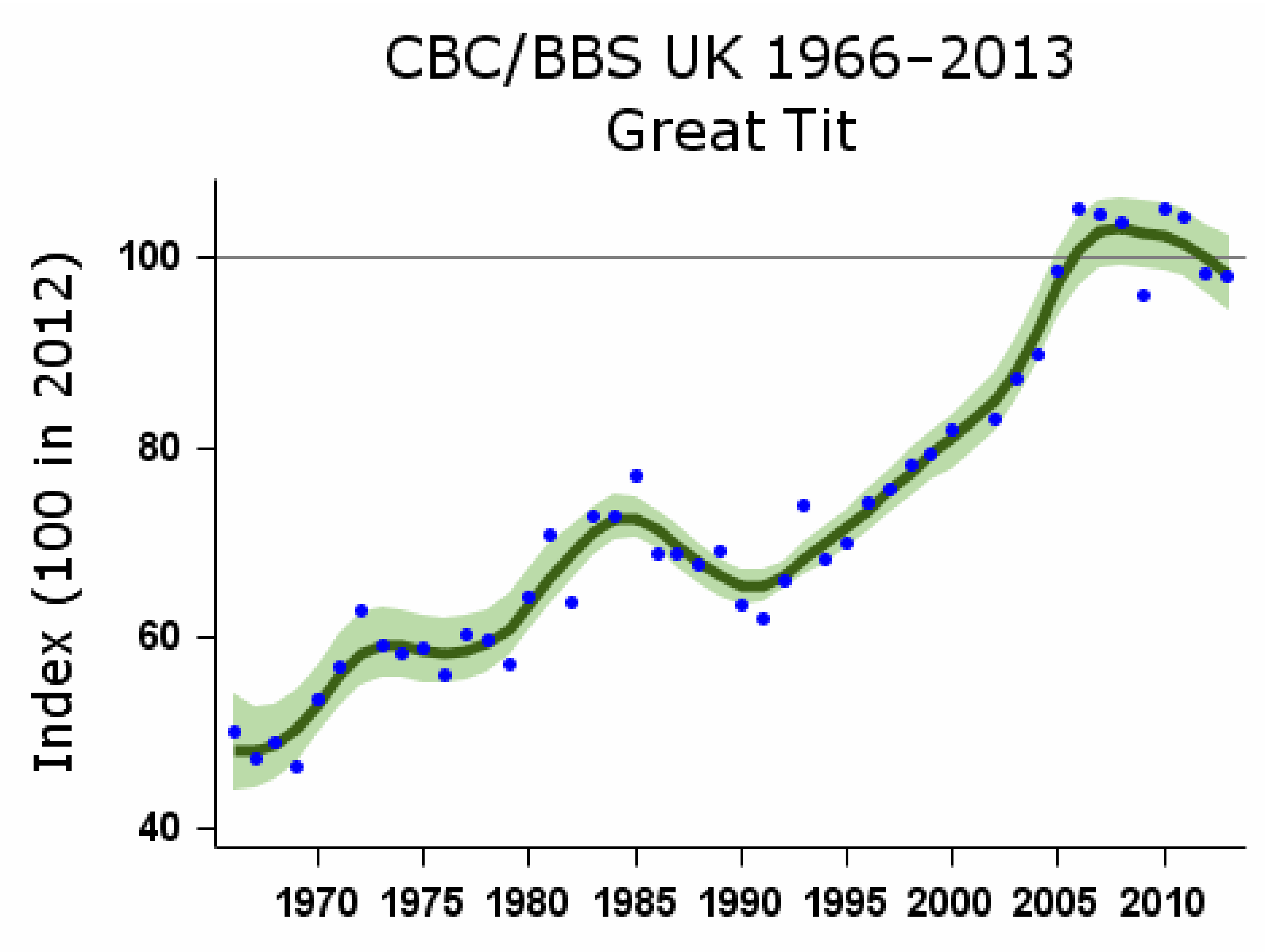
Key facts

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: rapid increase England: moderate 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 2014a).



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	45	1967-2012	1016	107	80	134		
	25	1987-2012	1661	44	35	52		
	10	2002-2012	2532	18	15	21		
	5	2007-2012	2836	-3	-5	0		
CBC/BBS England	45	1967-2012	835	94	69	123		
	25	1987-2012	1358	37	30	45		
	10	2002-2012	2054	13	10	16		
	5	2007-2012	2317	-5	-7	-2		
CES adults	28	1984-2012	94	22	2	48		
	25	1987-2012	100	33	12	61		
	10	2002-2012	104	12	1	23		
	5	2007-2012	103	-14	-22	-5		
CES juveniles	28	1984-2012	97	-16	-39	18		
	25	1987-2012	103	-4	-29	30		
	10	2002-2012	107	-21	-30	-10		
	5	2007-2012	106	-22	-31	-12		
BBS UK	17	1995-2012	2210	43	38	48		
	10	2002-2012	2532	18	15	22		
	5	2007-2012	2836	-2	-4	1		
BBS England	17	1995-2012	1797	36	32	41		
	10	2002-2012	2054	12	9	15		
	5	2007-2012	2317	-5	-7	-2		
BBS Scotland	17	1995-2012	154	56	35	80		
	10	2002-2012	178	37	20	56		
	5	2007-2012	210	4	-8	15		
BBS Wales	17	1995-2012	172	48	30	68		
	10	2002-2012	196	18	7	33		
	5	2007-2012	197	-4	-14	8		
BBS N.Ireland	17	1995-2012	73	163	93	200		
	10	2002-2012	89	40	23	62		
	5	2007-2012	95	5	-5	12		

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

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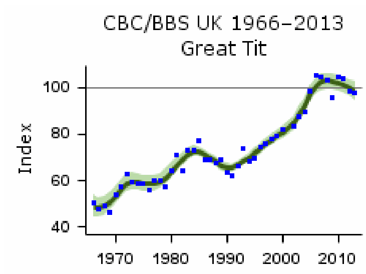
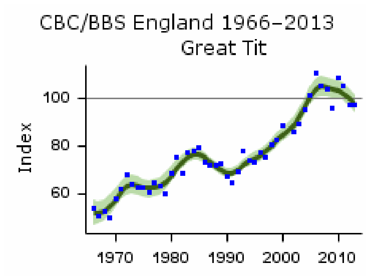


CBC/BBS UK graph



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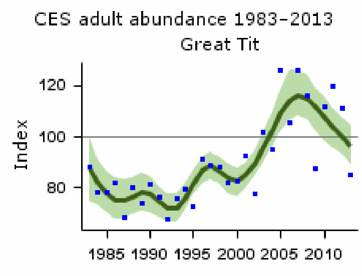
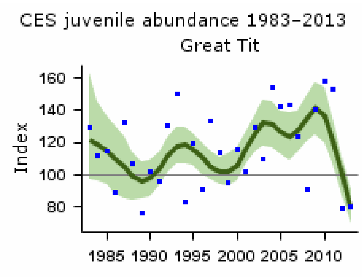
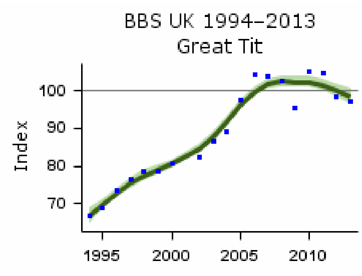


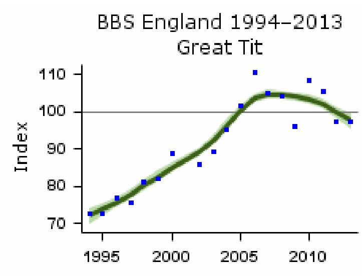
CES adults graph



CES juveniles graph



BBS UK graph



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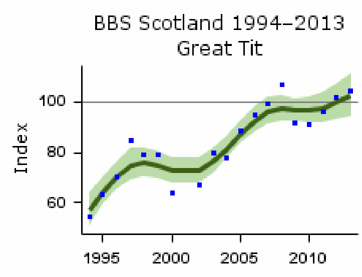

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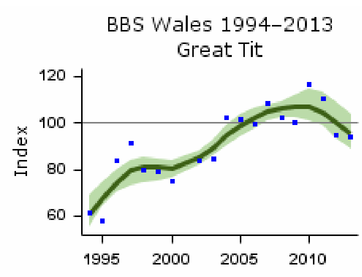
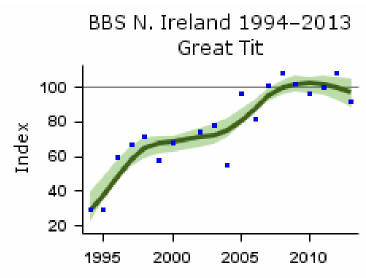
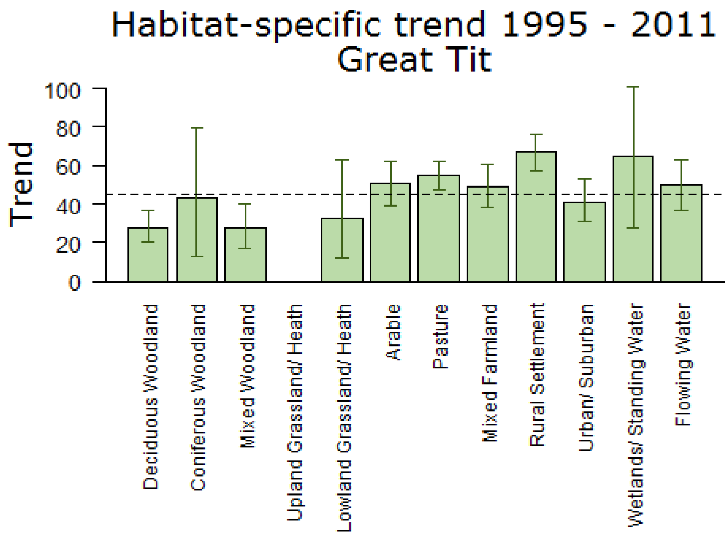


BBS Wales graph



BBS N.Ireland graph

Population trends by habitat



Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

More on habitat trends

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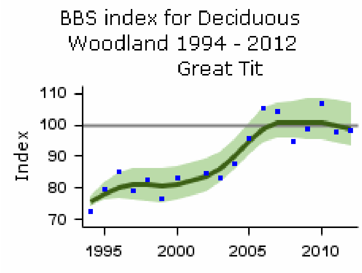
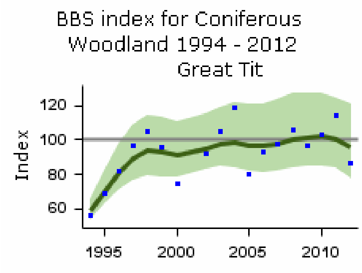
Lowland Grassland/ Heath	16	1995-2011	125	33	12	63
Arable	16	1995-2011	626	51	39	62
Pasture	16	1995-2011	1121	55	48	62
Mixed Farmland	16	1995-2011	571	49	39	61
Rural Settlement	16	1995-2011	722	67	57	77
Urban/ Suburban	16	1995-2011	368	41	31	53
Wetlands/ Standing Water	16	1995-2011	78	65	28	101
Flowing Water	16	1995-2011	421	50	36	63

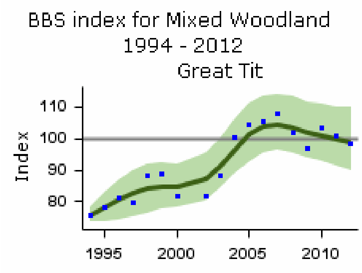
Further information on habitat-specific trends, please follow link here.



Habitat graph



Habitat graph



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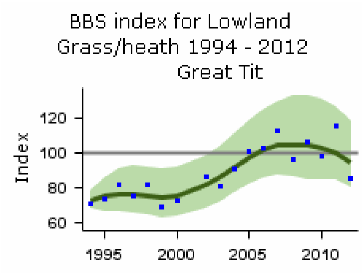
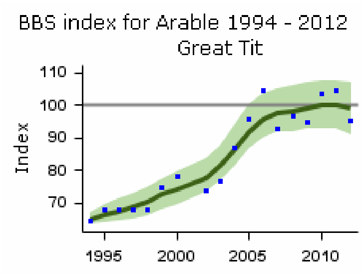
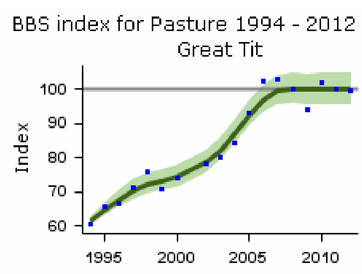


Habitat graph



Habitat graph



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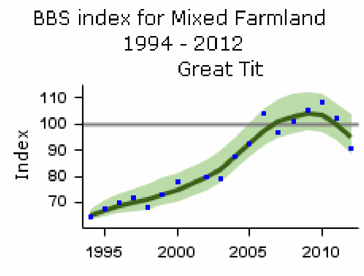
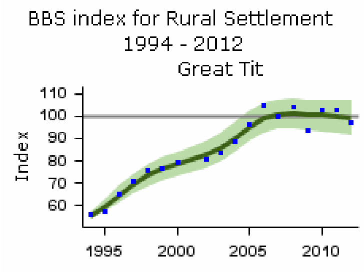
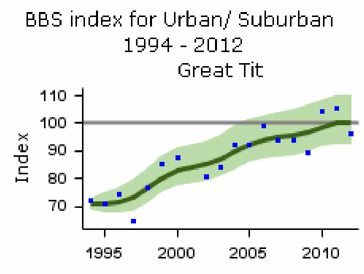


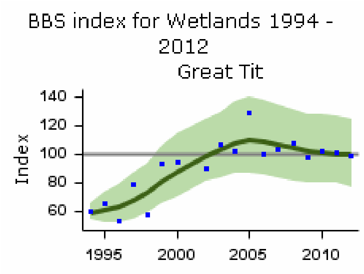
Habitat graph



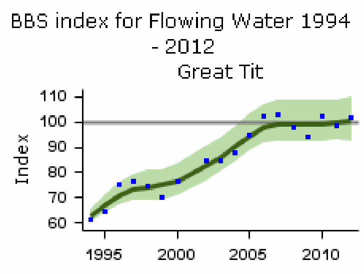
Habitat graph



Habitat graph

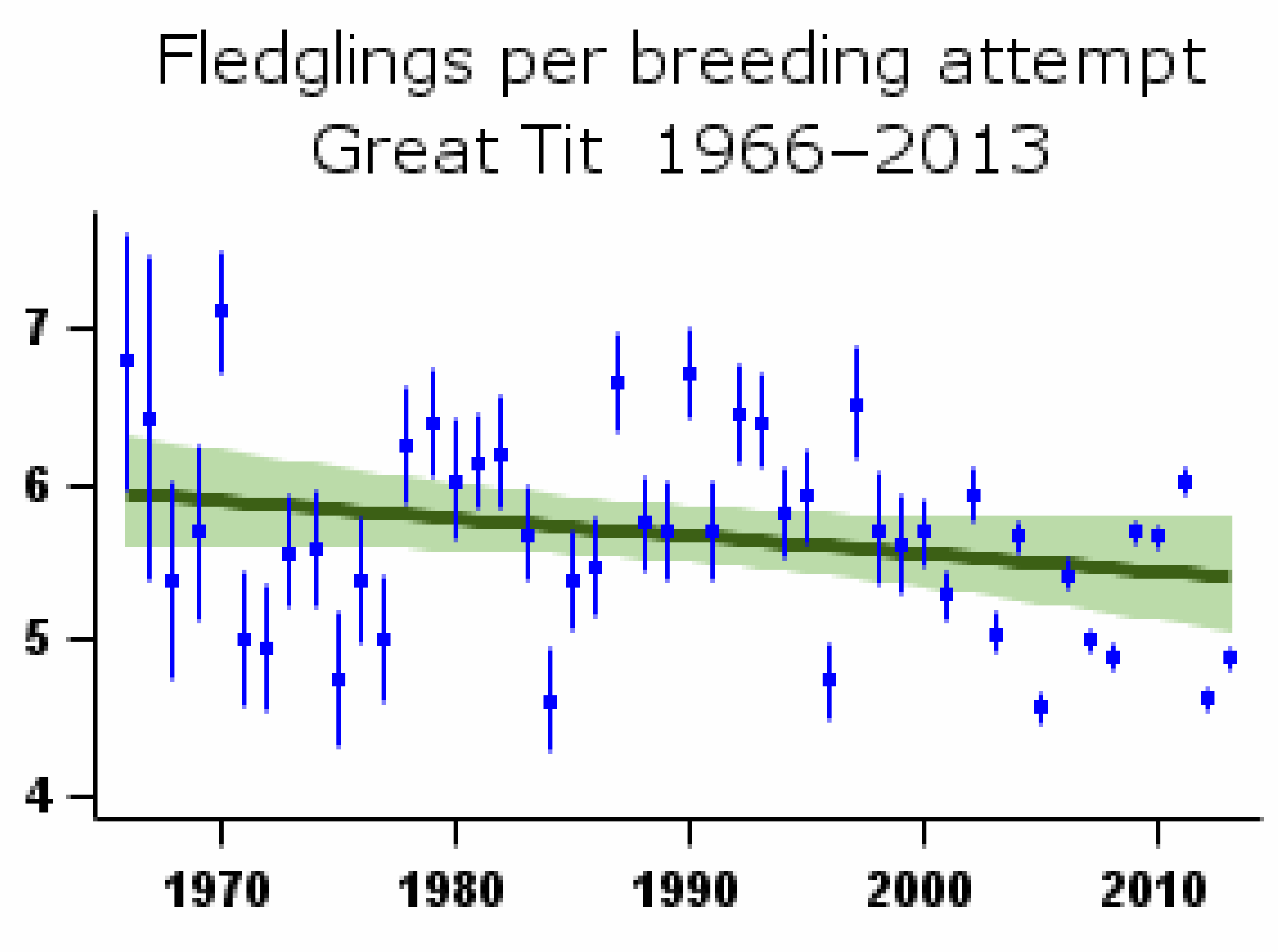


Habitat graph

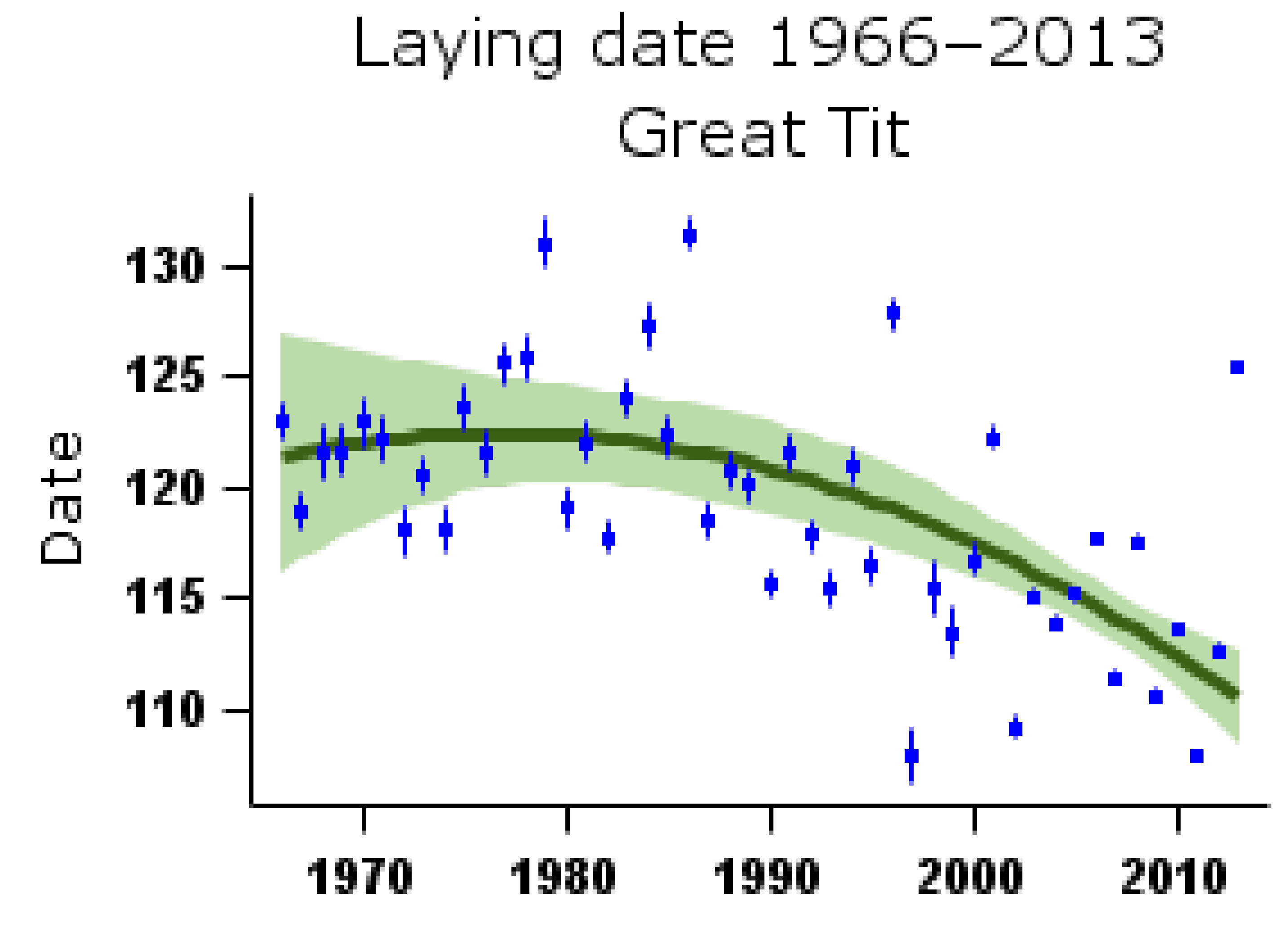


Habitat graph

Demographic trends



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

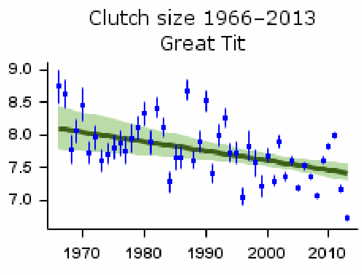


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

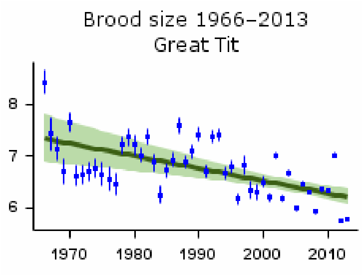
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	449	None					
Clutch size	44	1968-2012	352	Linear decline	8.08 eggs	7.43 eggs	-8.0%		
Brood size	44	1968-2012	736	Linear decline	7.29 chicks	6.22 chicks	-14.6%		
Nest failure rate at egg stage	44	1968-2012	657	Curvilinear	0.61% nests/day	0.27% nests/day	-55.7%		
Nest failure rate at chick stage	44	1968-2012	449	None					
Laying date	44	1968-2012	404	Curvilinear	May 2	Apr 21	-11 days		
Juvenile to Adult ratio (CES)	28	1984-2012	102	Smoothed trend	157 Index value	100 Index value	-36%	>25	
Juvenile to Adult ratio (CES)	25	1987-2012	109	Smoothed trend	144 Index value	100 Index value	-30%	>25	
Juvenile to Adult ratio (CES)	10	2002-2012	111	Smoothed trend	132 Index value	100 Index value	-24%		
Juvenile to Adult ratio (CES)	5	2007-2012	110	Smoothed trend	98 Index value	100 Index value	2%		

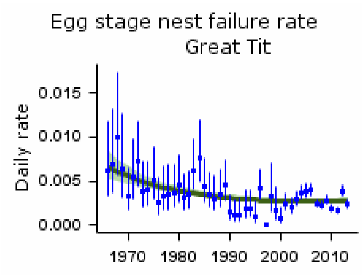
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



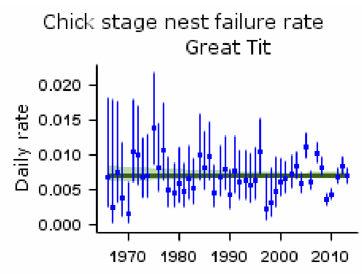
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



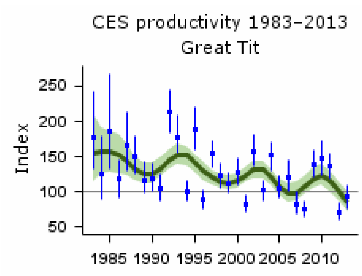
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



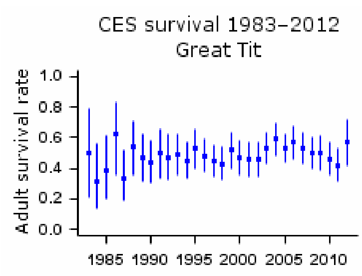
Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



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

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 been unchanged but clutch and brood sizes have decreased (see above). Daily failure rates at the egg stage have also decreased but daily failure rates at the chick stage have increased. Consequently, breeding success does not contribute substantially to population change, and integrated modelling confirms that variation adult survival is the primary driver of annual population change (Robinson et al. 2014).

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 are also likely to influence survival rates. There is some evidence that the beech crop may be influential and it has been shown that survival rates can be related to beechmast production (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, in line with climatic change. This has been found by several studies (e.g. Sanz 2002, Visser et al. 2009, Bauer et al. 2010), but does not seem to be influencing the population trend.

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Coal Tit

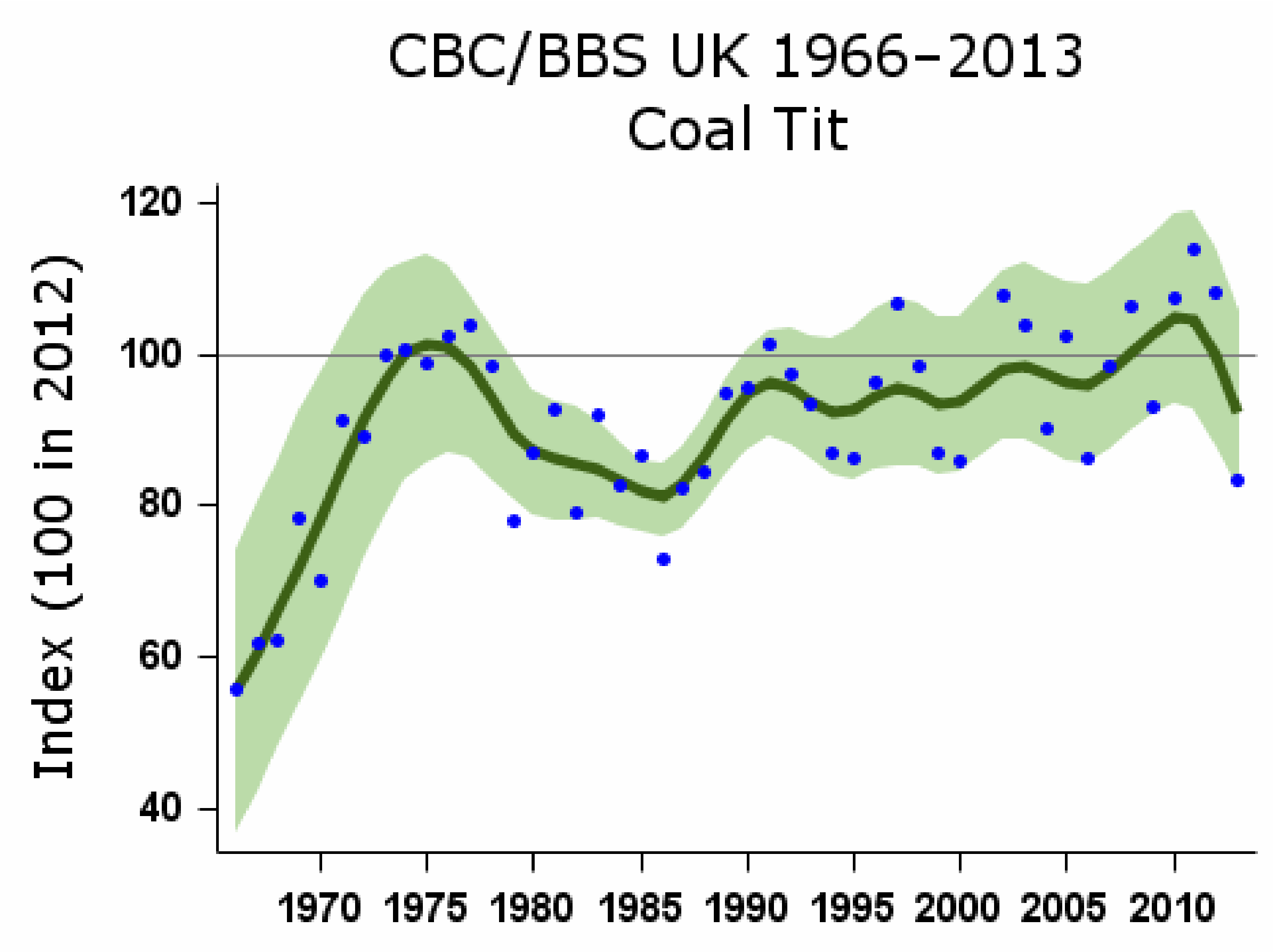
Periparus ater

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 2014a).



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

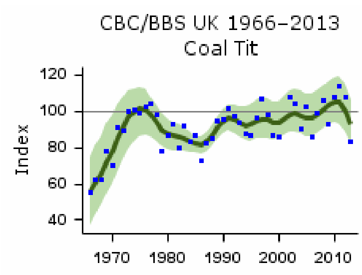
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	45	1967-2012	403	65	6	177		
	25	1987-2012	636	20	4	43		
	10	2002-2012	968	2	-7	11		
	5	2007-2012	1110	2	-3	9		
CBC/BBS England	45	1967-2012	281	61	-6	182		
	25	1987-2012	434	23	4	48		

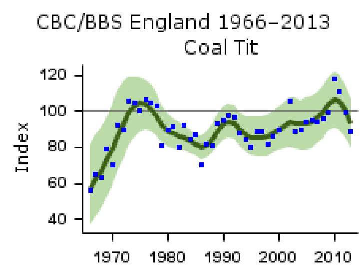
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	10	2002-2012	655	6	-2	15		
	5	2007-2012	759	4	-2	10		
BBS UK	17	1995-2012	823	11	2	24		
	10	2002-2012	968	3	-5	14		
	5	2007-2012	1110	3	-3	11		
BBS England	17	1995-2012	551	20	7	38		
	10	2002-2012	655	7	-2	17		
	5	2007-2012	759	3	-2	11		
BBS Scotland	17	1995-2012	132	1	-12	20		
	10	2002-2012	149	0	-17	19		
	5	2007-2012	180	0	-10	13		
BBS Wales	17	1995-2012	74	-23	-44	5		
	10	2002-2012	84	-12	-37	13		
	5	2007-2012	86	3	-12	31		
BBS N.Ireland	17	1995-2012	64	80	25	132		
	10	2002-2012	77	0	-16	20		
	5	2007-2012	84	4	-12	15		

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

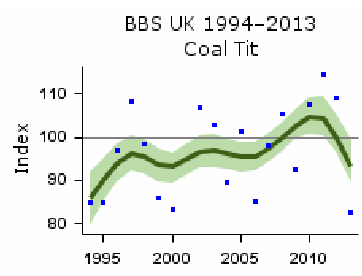
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



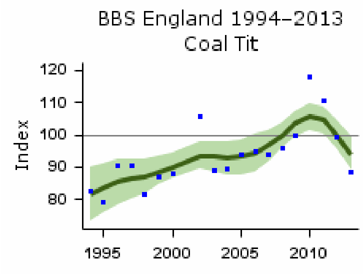
CBC/BBS UK graph



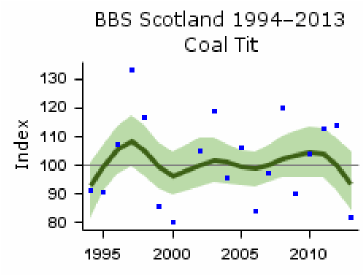
CBC/BBS England graph



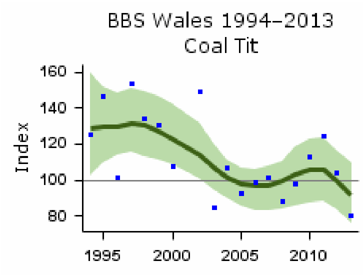
BBS UK graph



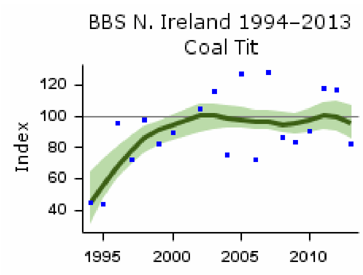
BBS England graph



BBS Scotland graph

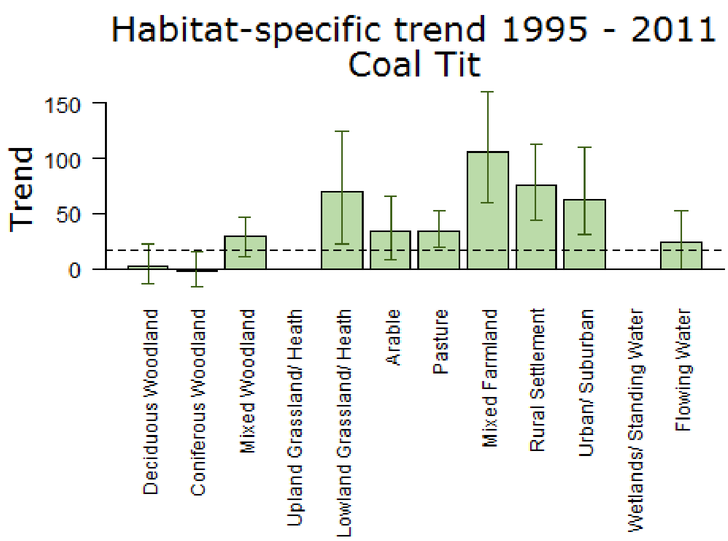


BBS Wales graph



BBS N.Ireland graph

Population trends by habitat



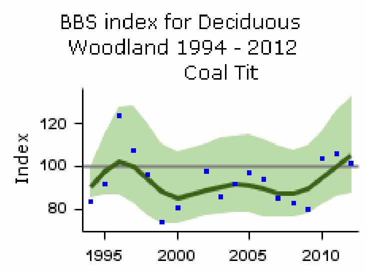
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

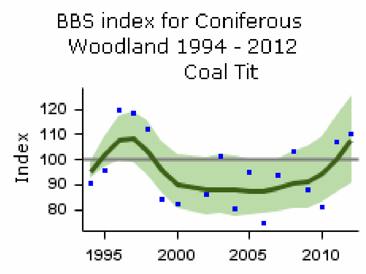
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	217	3	-13	22
Coniferous Woodland	16	1995-2011	164	-2	-16	15
Mixed Woodland	16	1995-2011	216	29	11	47
Lowland Grassland/ Heath	16	1995-2011	55	70	22	125
Arable	16	1995-2011	106	34	8	65
Pasture	16	1995-2011	292	34	20	53
Mixed Farmland	16	1995-2011	66	106	61	160
Rural Settlement	16	1995-2011	133	76	43	112
Urban/ Suburban	16	1995-2011	78	63	30	109
Flowing Water	16	1995-2011	85	24	-1	52

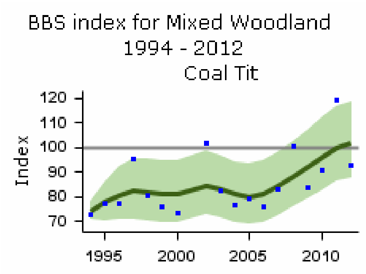
Further information on habitat-specific trends, please follow link here.



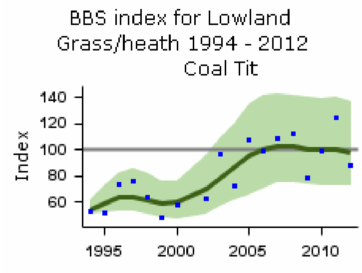
Habitat graph



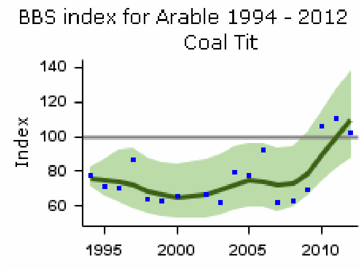
Habitat graph



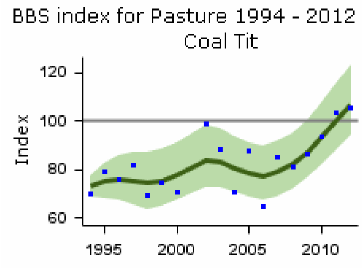
Habitat graph



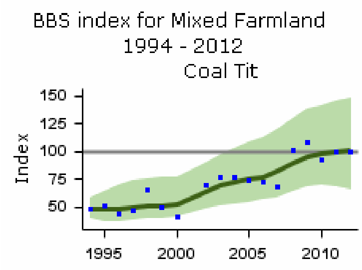
Habitat graph



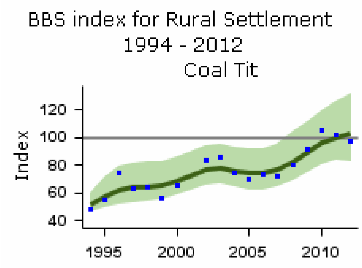
Habitat graph



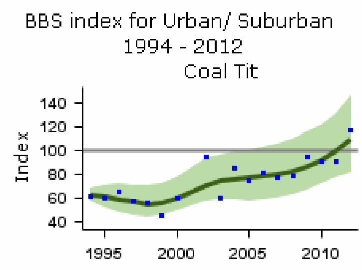
Habitat graph



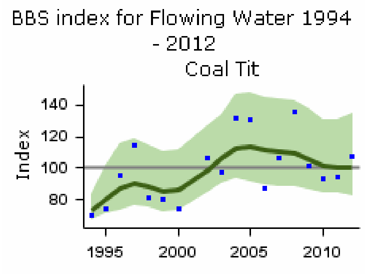
Habitat graph



Habitat graph

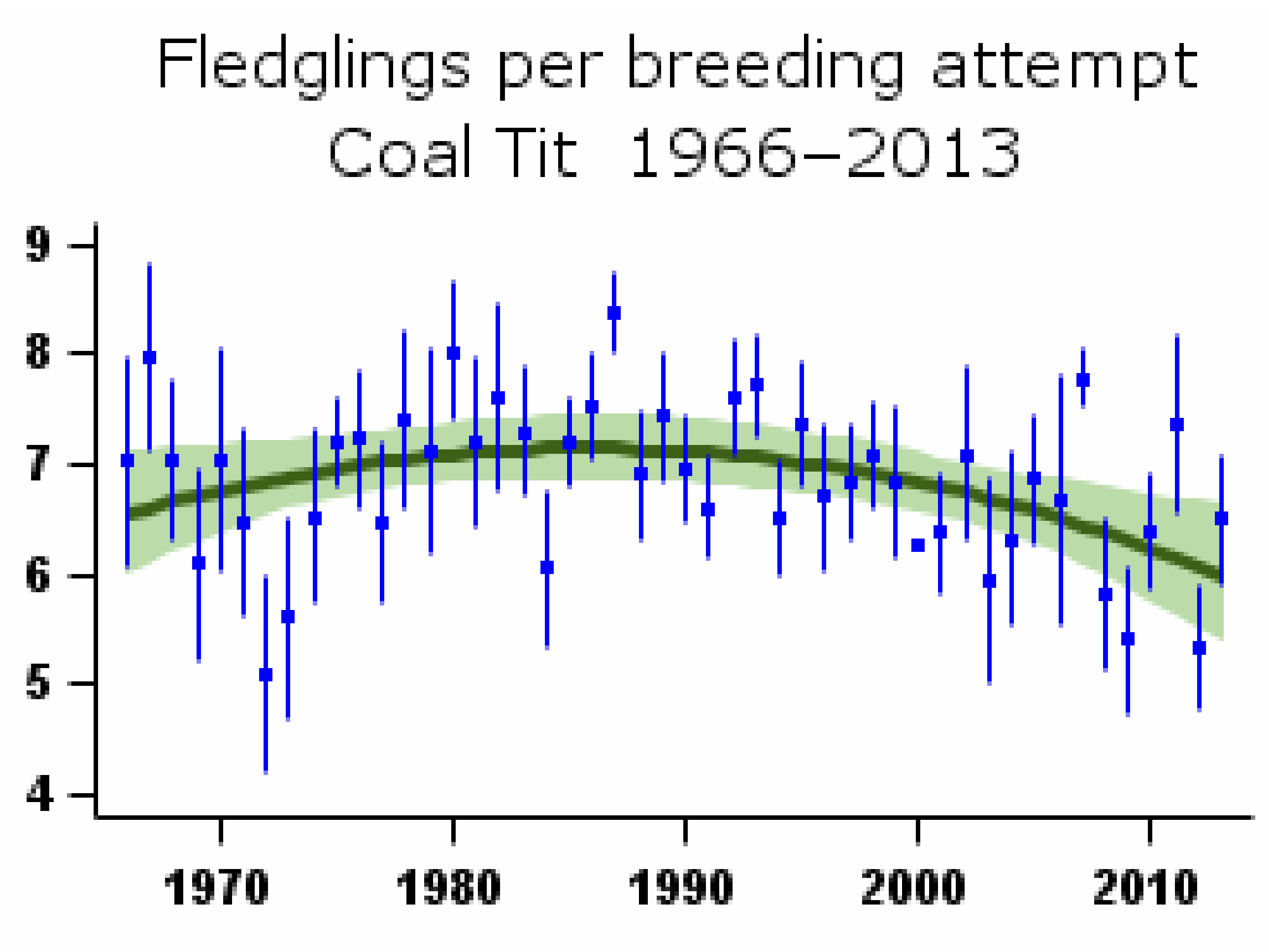


Habitat graph

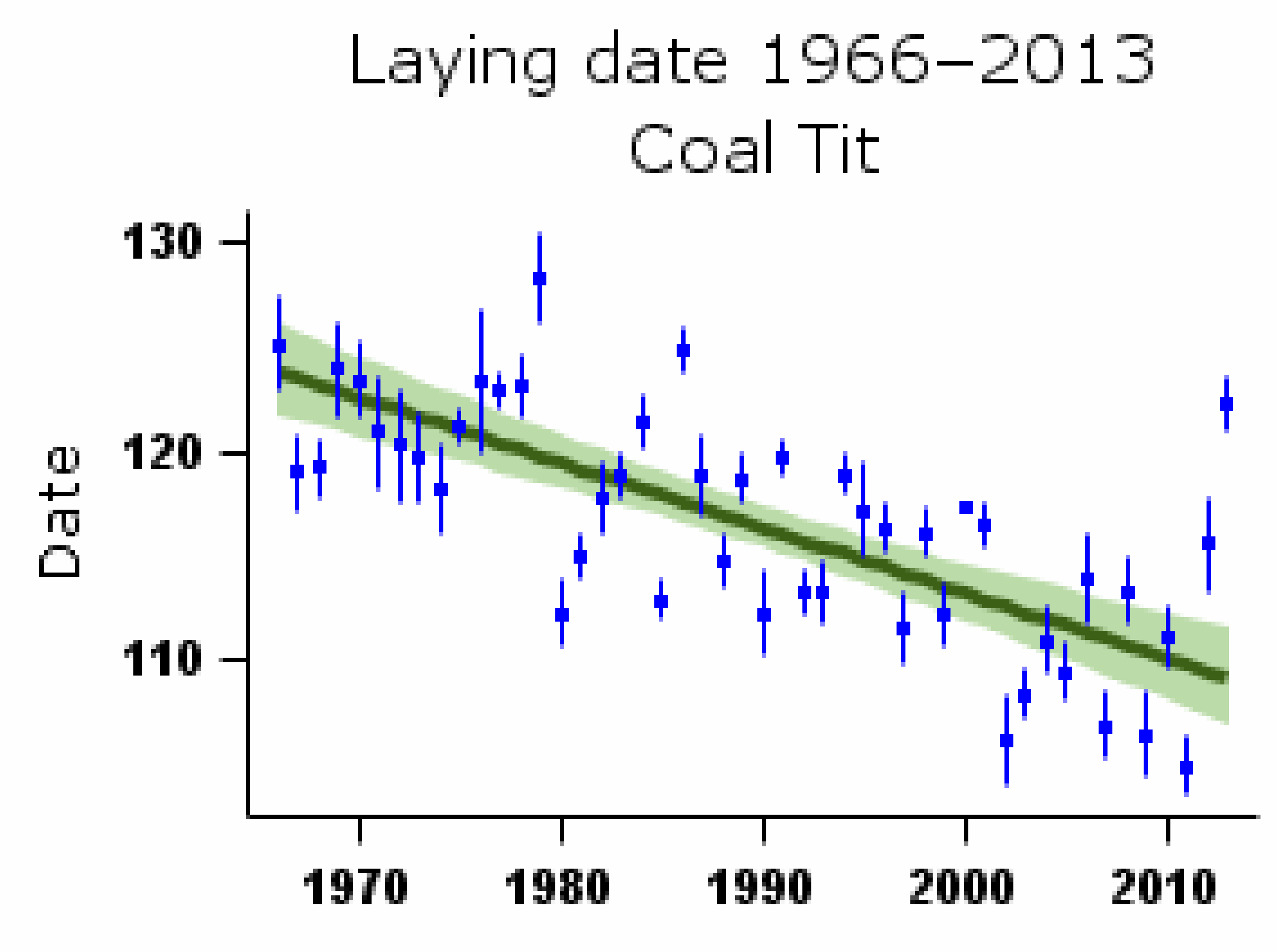


Habitat graph

Demographic trends



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

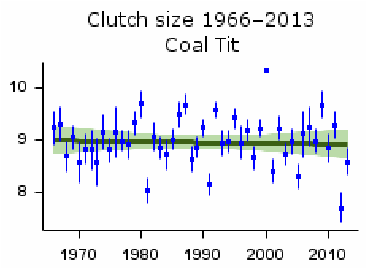


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

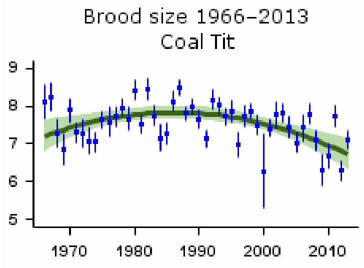
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	54	Curvilinear	6.67 fledglings	6.09 fledglings	-8.6%		
Clutch size	44	1968-2012	40	None					
Brood size	44	1968-2012	74	Curvilinear	7.32 chicks	6.80 chicks	-7.1%		
Nest failure rate at egg stage	44	1968-2012	56	Linear decline	0.48% nests/day	0.15% nests/day	-68.8%		
Nest failure rate at chick stage	44	1968-2012	58	Linear increase	0.18% nests/day	0.46% nests/day	155.6%		
Laying date	44	1968-2012	45	Linear decline	May 3	Apr 20	-13 days		

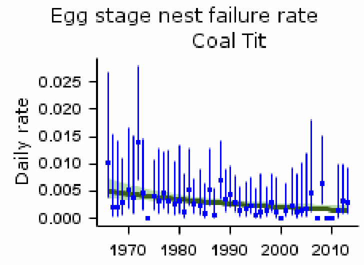
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



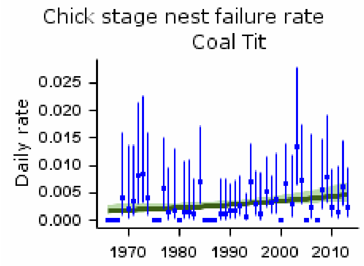
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



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

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Willow Tit

Poecile montanus

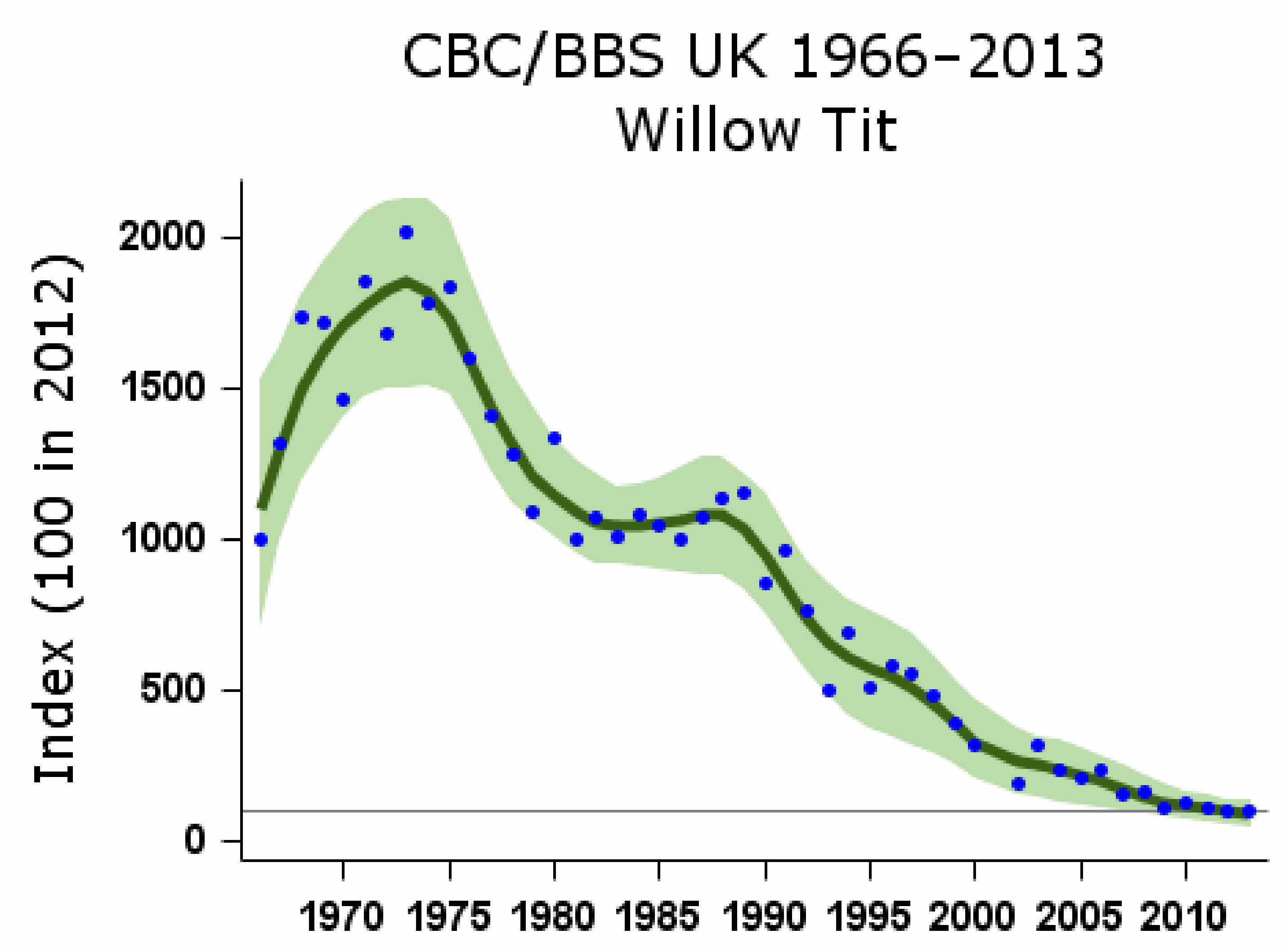
Key facts

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 UK conservation listing was upgraded from amber to red in 2002. Atlas surveys during 2008-11 found that the species had virtually disappeared from the southeastern part of its English range since 1988-91 (Balmer et al. 2013). 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. All UK breeding records since 2010 should be forwarded to the Rare Breeding Birds Panel, who have developed specific PECBMS 2007, 2014a).



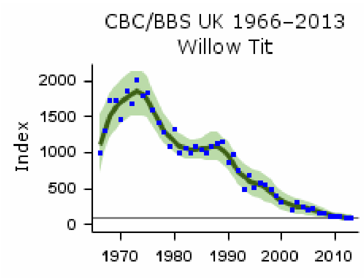
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

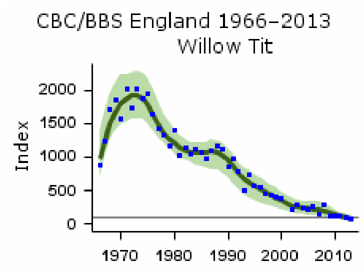
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	45	1967-2012	43	-92	-97	-85	>50	
	25	1987-2012	47	-91	-95	-85	>50	Small CBC sample
	10	2002-2012	44	-62	-72	-52	>50	
	5	2007-2012	42	-42	-56	-31	>25	
CBC/BBS England	45	1967-2012	40	-92	-96	-86	>50	
	25	1987-2012	42	-91	-94	-86	>50	Small CBC sample
	10	2002-2012	39	-63	-73	-54	>50	
	5	2007-2012	38	-52	-66	-38	>50	
CES adults	28	1984-2012	18	-67	-90	-35	>50	Small sample
	25	1987-2012	18	-72	-92	-45	>50	Small sample
CES juveniles	28	1984-2012	26	-79	-89	-61	>50	
	25	1987-2012	27	-78	-89	-63	>50	
	10	2002-2012	14	-64	-79	-46	>50	Small sample
	5	2007-2012	13	-46	-68	-15	>25	Small sample
BBS UK	17	1995-2012	49	-83	-88	-78	>50	
	10	2002-2012	44	-62	-72	-52	>50	
	5	2007-2012	42	-42	-56	-32	>25	
BBS England	17	1995-2012	44	-83	-89	-78	>50	
	10	2002-2012	39	-64	-72	-54	>50	
	5	2007-2012	38	-51	-64	-37	>50	

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

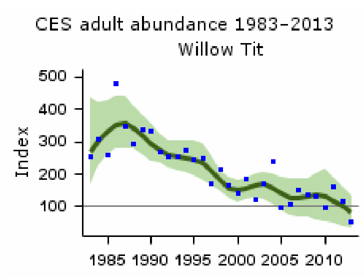
BTO JNCC rspb The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



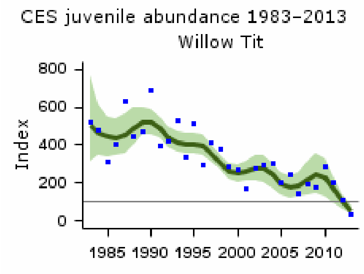
CBC/BBS UK graph



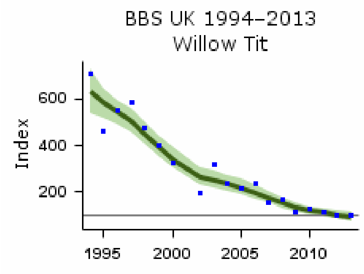
CBC/BBS England graph



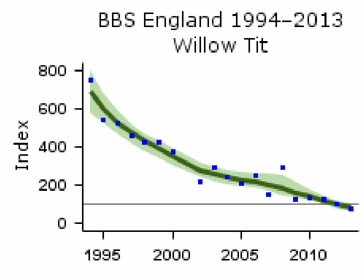
CES adults graph



CES juveniles graph

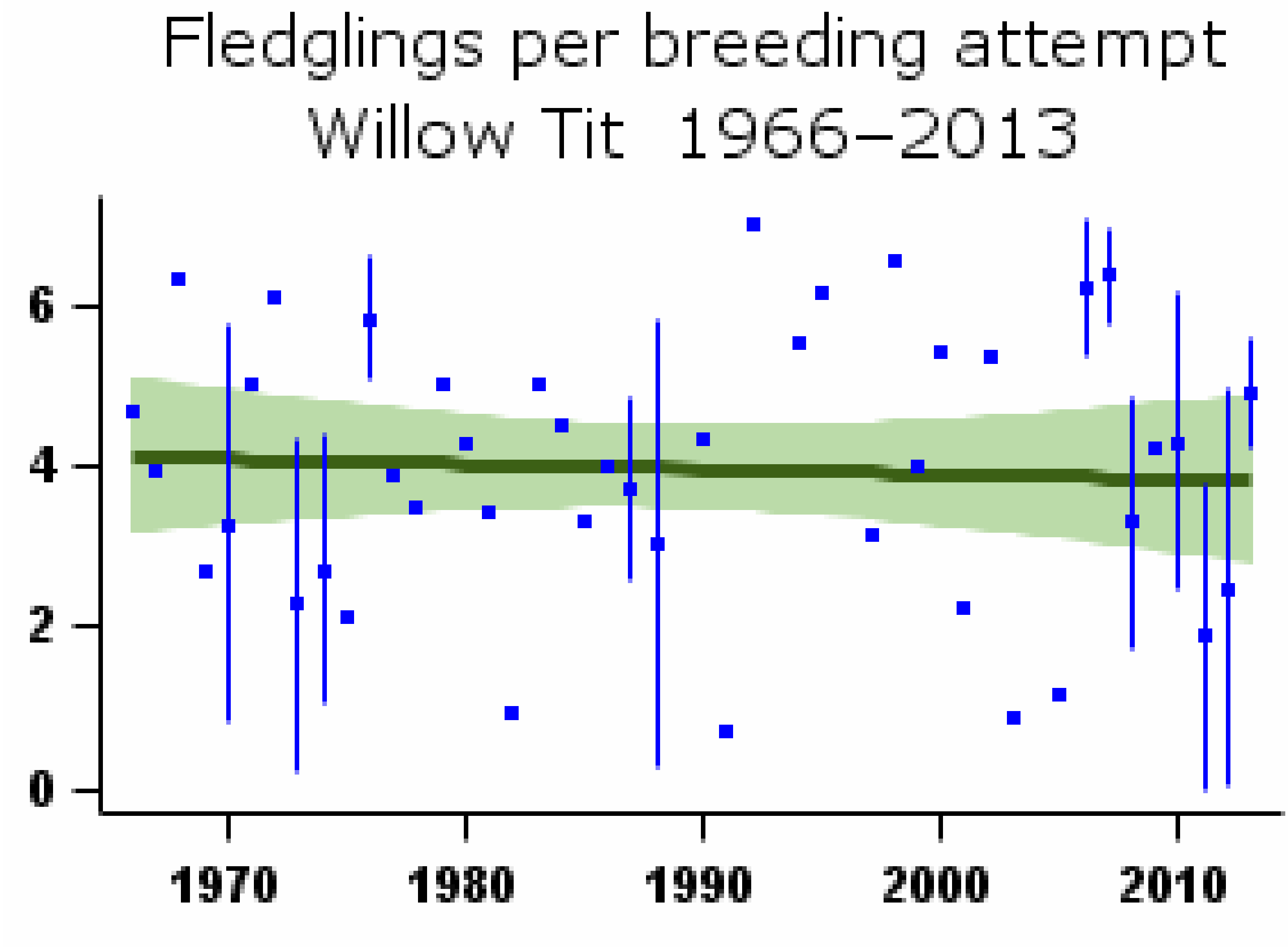


BBS UK graph

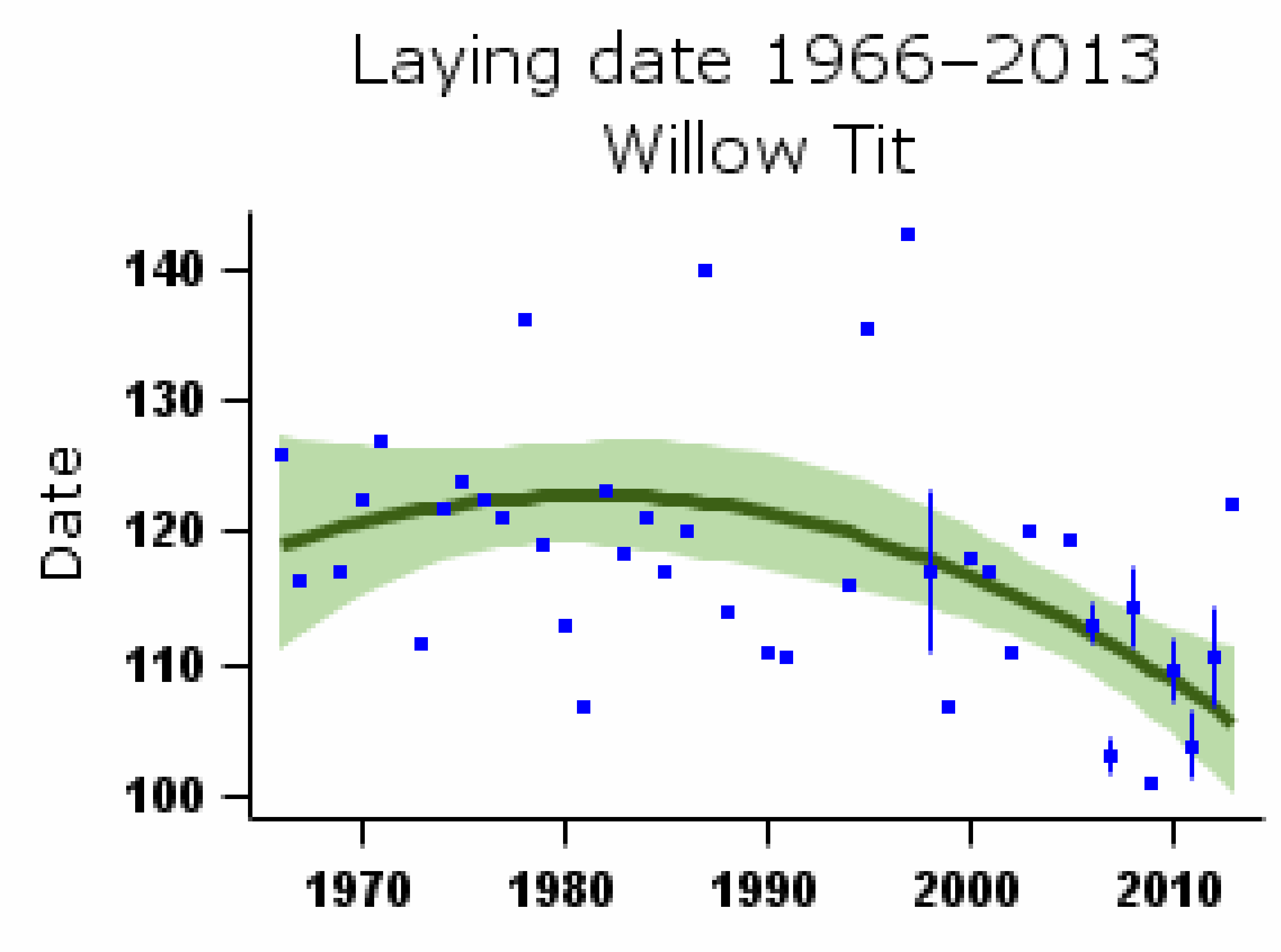


BBS England graph

Demographic trends



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

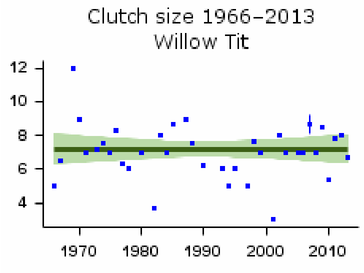


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

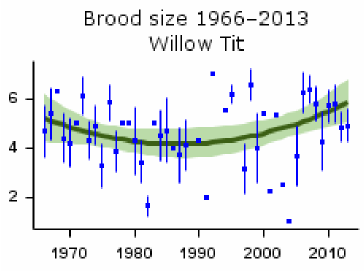
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	4	None					
Clutch size	44	1968-2012	3	None					Small sample
Brood size	44	1968-2012	7	Curvilinear	5.01 chicks	5.73 chicks	14.4%		Small sample
Nest failure rate at egg stage	44	1968-2012	5	None					Small sample
Nest failure rate at chick stage	44	1968-2012	5	Curvilinear	0.87% nests/day	2.39% nests/day	174.7%		Small sample
Laying date	44	1968-2012	3	Curvilinear	Apr 30	Apr 17	-13 days		Small sample
Juvenile to Adult ratio (CES)	28	1984-2012	29	Smoothed trend	320 Index value	100 Index value	-69%	>50	
Juvenile to Adult ratio (CES)	25	1987-2012	30	Smoothed trend	210 Index value	100 Index value	-52%		
Juvenile to Adult ratio (CES)	10	2002-2012	16	Smoothed trend	294 Index value	100 Index value	-66%	>50	
Juvenile to Adult ratio (CES)	5	2007-2012	15	Smoothed trend	186 Index value	100 Index value	-46%		

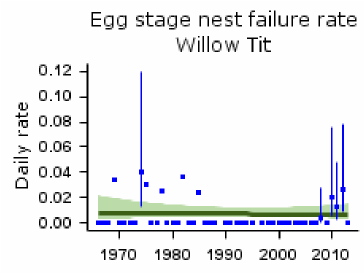
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



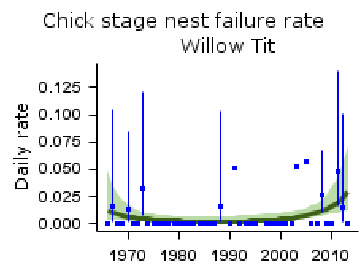
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



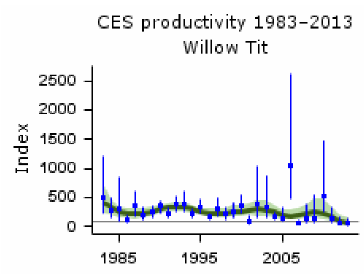
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



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

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 shows very different habitat preferences to the Fennoscandian one, preferring wet woodland rather than conifers, emphasising that Continental 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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Marsh Tit

Poecile palustris

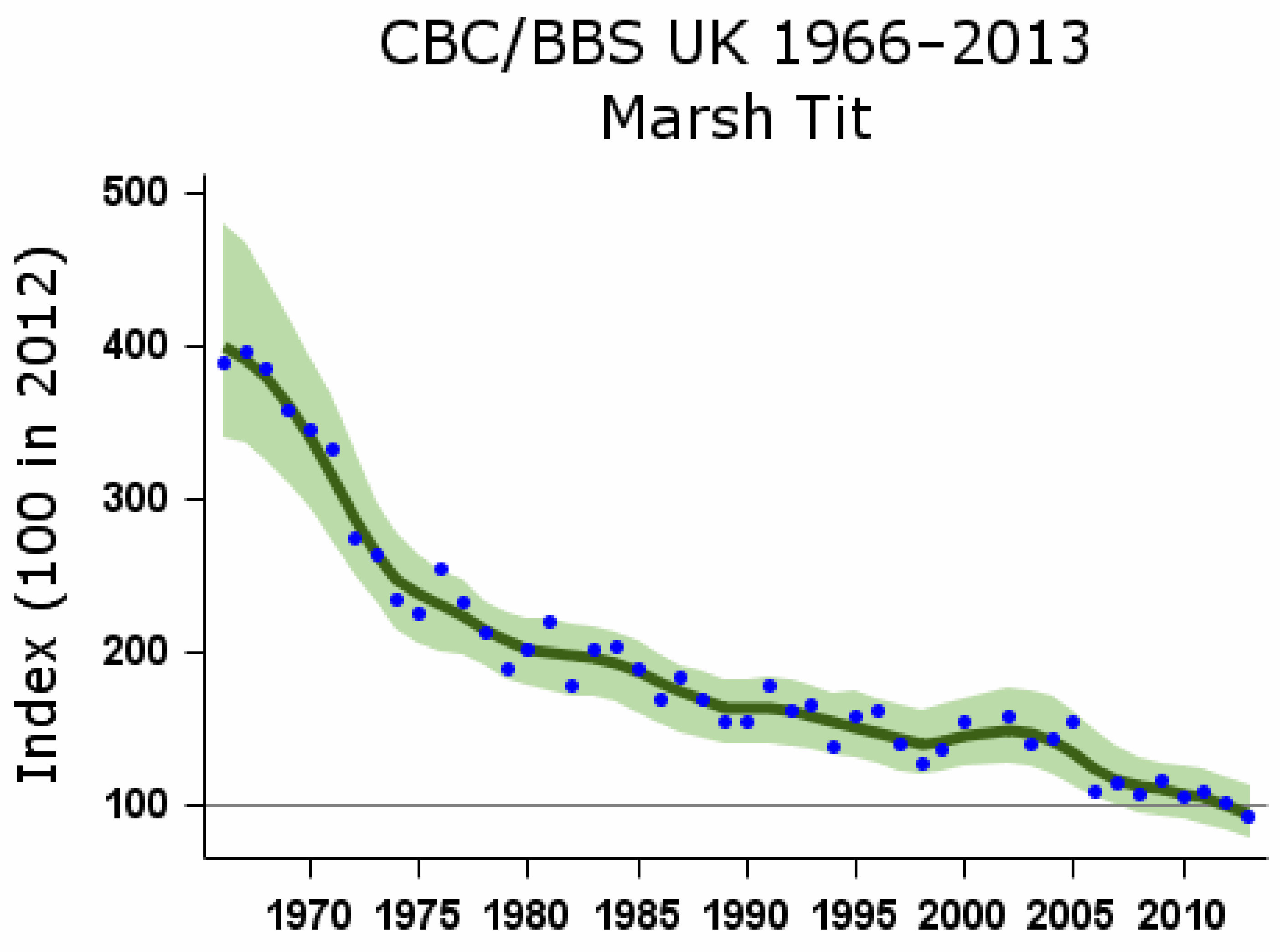
Key facts

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 been upgraded from amber to red. Numbers have shown widespread moderate decline across Europe since 1980, though with some increase since 2000 (PECBMS 2014a) and the European status of this species is no longer considered "secure" (BirdLife International 2004).



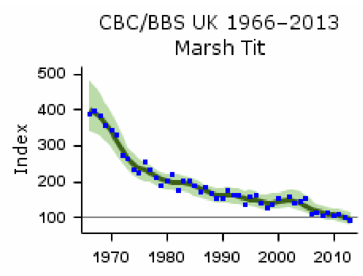
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

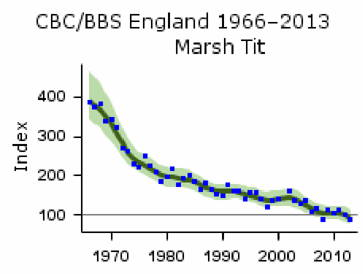
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	45	1967-2012	100	-74	-82	-65	>50	
	25	1987-2012	134	-42	-54	-25	>25	
	10	2002-2012	163	-33	-44	-22	>25	
	5	2007-2012	169	-14	-26	-2		
CBC/BBS England	45	1967-2012	92	-74	-81	-64	>50	
	25	1987-2012	122	-42	-53	-26	>25	
	10	2002-2012	148	-31	-41	-17	>25	
	5	2007-2012	155	-10	-24	4		
BBS UK	17	1995-2012	150	-29	-41	-15	>25	
	10	2002-2012	163	-34	-43	-23	>25	
	5	2007-2012	169	-14	-27	-3		
BBS England	17	1995-2012	135	-31	-43	-17	>25	
	10	2002-2012	148	-31	-43	-15	>25	
	5	2007-2012	155	-10	-22	3		

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

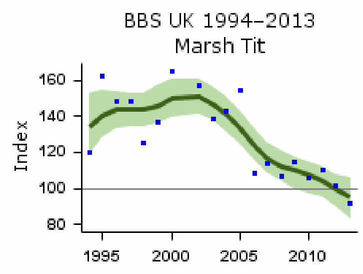
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



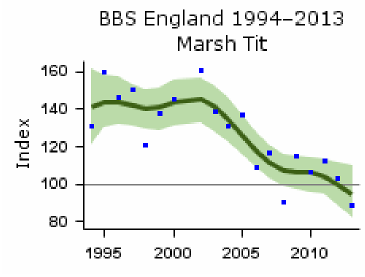
CBC/BBS UK graph



CBC/BBS England graph

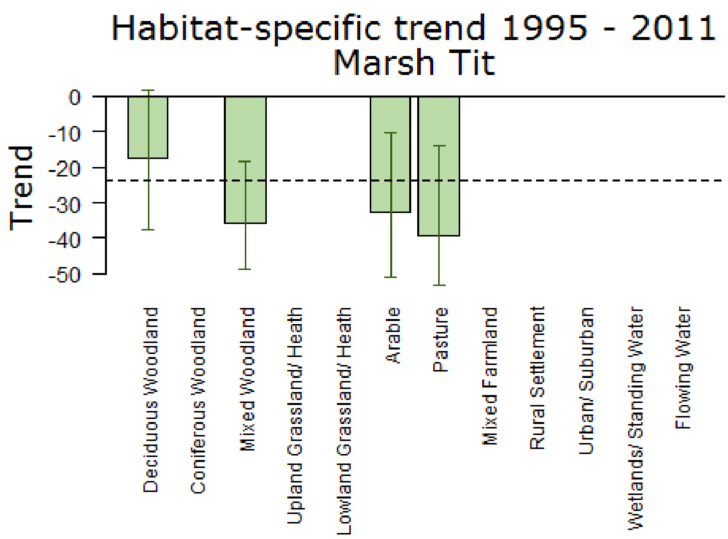


BBS UK graph



BBS England graph

Population trends by habitat



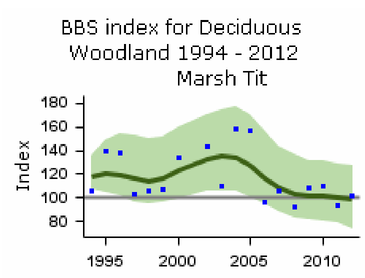
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

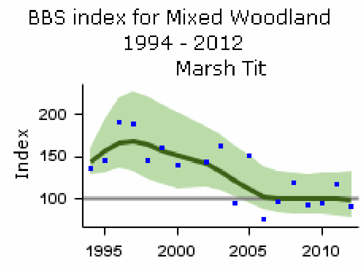
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	60	-17	-37	2
Mixed Woodland	16	1995-2011	38	-36	-49	-18
Arable	16	1995-2011	30	-33	-51	-10
Pasture	16	1995-2011	43	-39	-53	-14

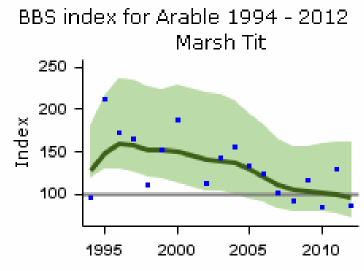
Further information on habitat-specific trends, please follow link here.



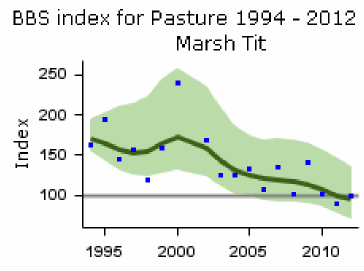
Habitat graph



Habitat graph

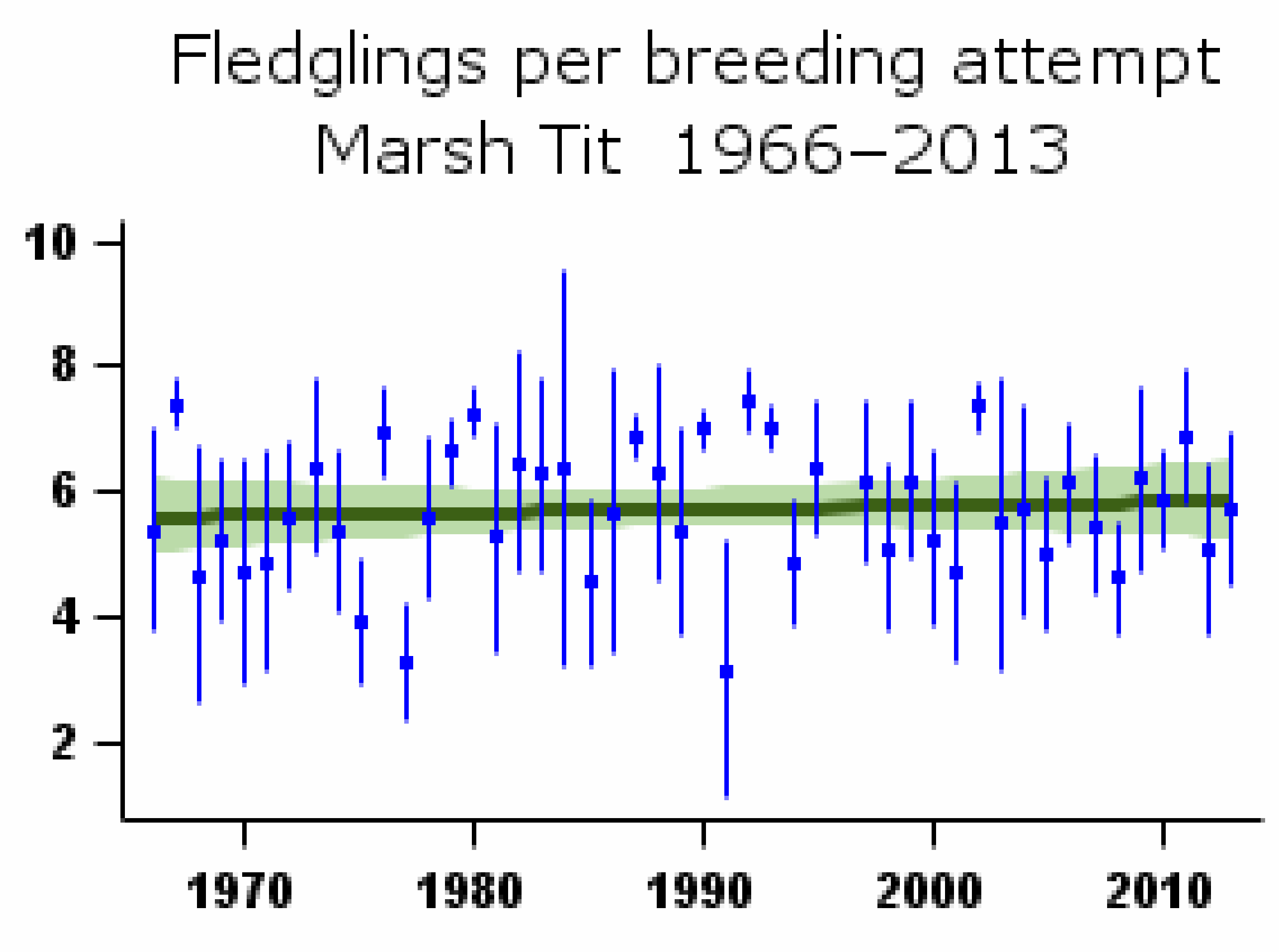


Habitat graph

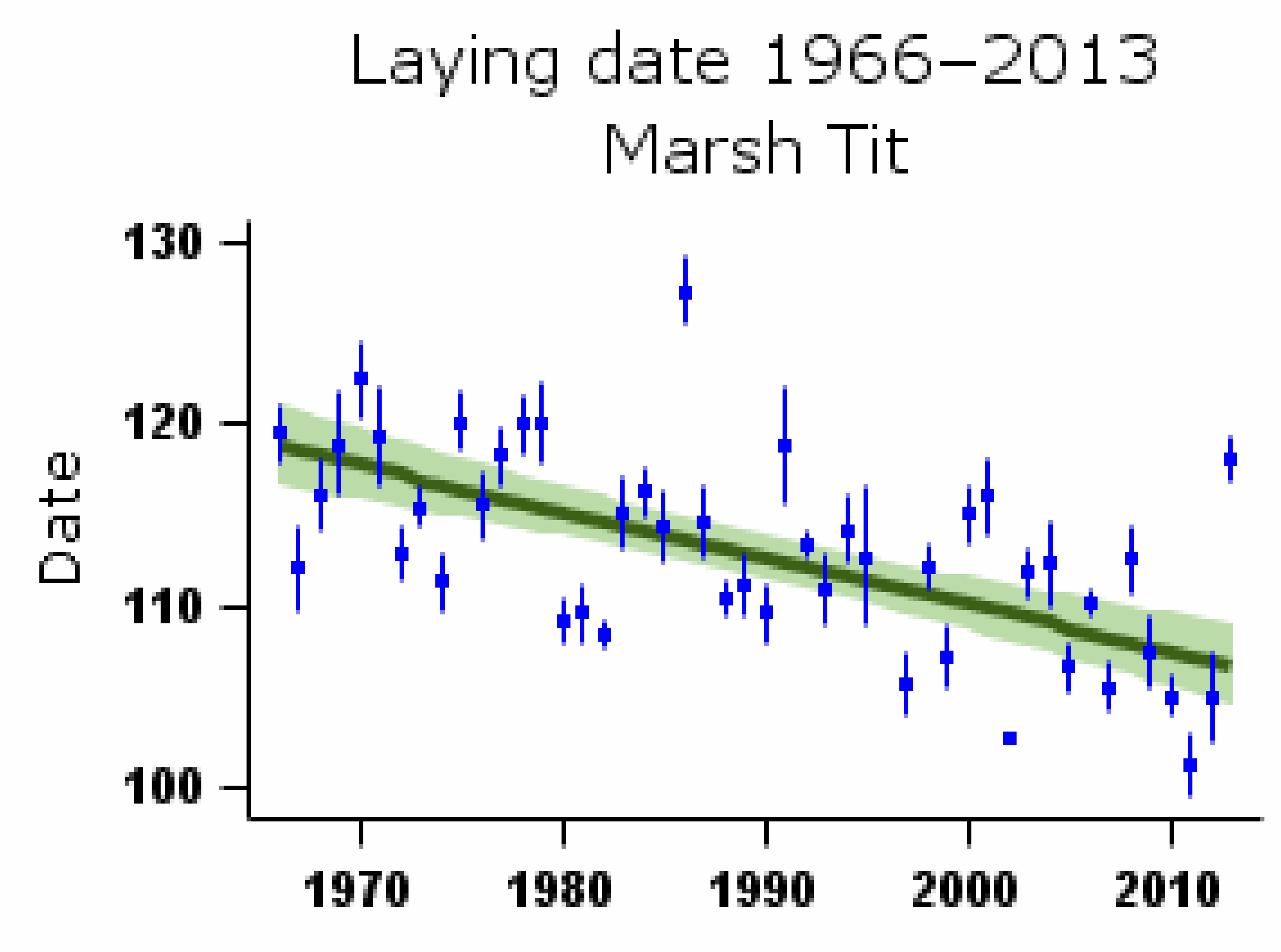


Habitat graph

Demographic trends



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

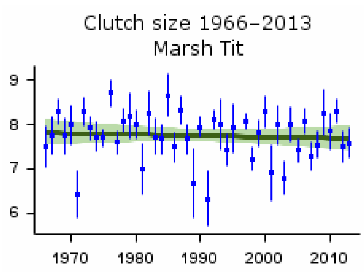


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

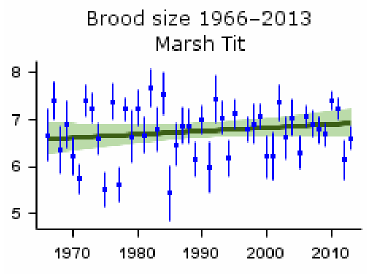
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	19	None					
Clutch size	44	1968-2012	14	None					Small sample
Brood size	44	1968-2012	24	None					Small sample
Nest failure rate at egg stage	44	1968-2012	21	Linear decline	0.72% nests/day	0.12% nests/day	-83.3%		Small sample
Nest failure rate at chick stage	44	1968-2012	20	None					Small sample
Laying date	44	1968-2012	14	Linear decline	Apr 28	Apr 17	-11 days		Small sample

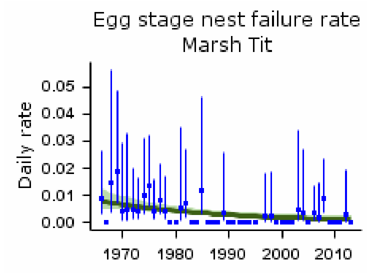
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



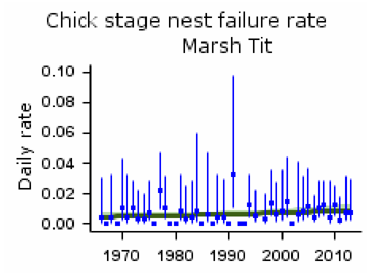
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



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

There is good evidence that changes in the habitat quality of woodlands, particularly 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 has 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.

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 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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

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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) UK Biodiversity Action Plan: 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

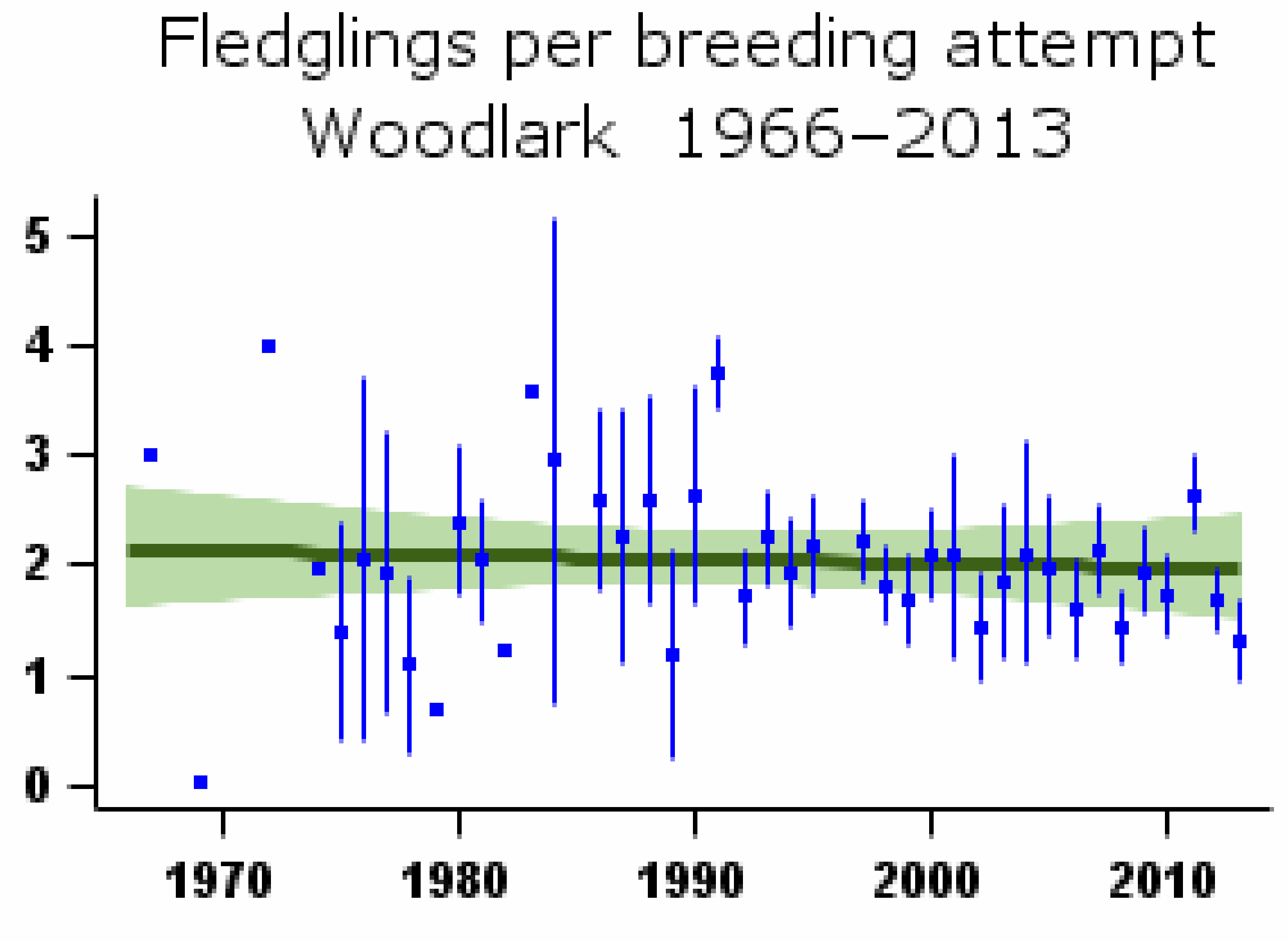
This species is too rare and restricted in range for population changes to be monitored annually by BTO volunteer surveys. A 62% reduction occurred in the number of 10-km squares occupied between 1968-72 and 1988-91; the species had ceased to breed in Wales and in several southern English counties over 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 Balmer et al. 2013).

Farmland setaside, especially close to forest, was valuable additional habitat for the expanding population, although clutch sizes may be lower there than in more traditional habitats (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). Numbers have shown widespread moderate increase across Europe since 1980 (PECBMS 2014a).

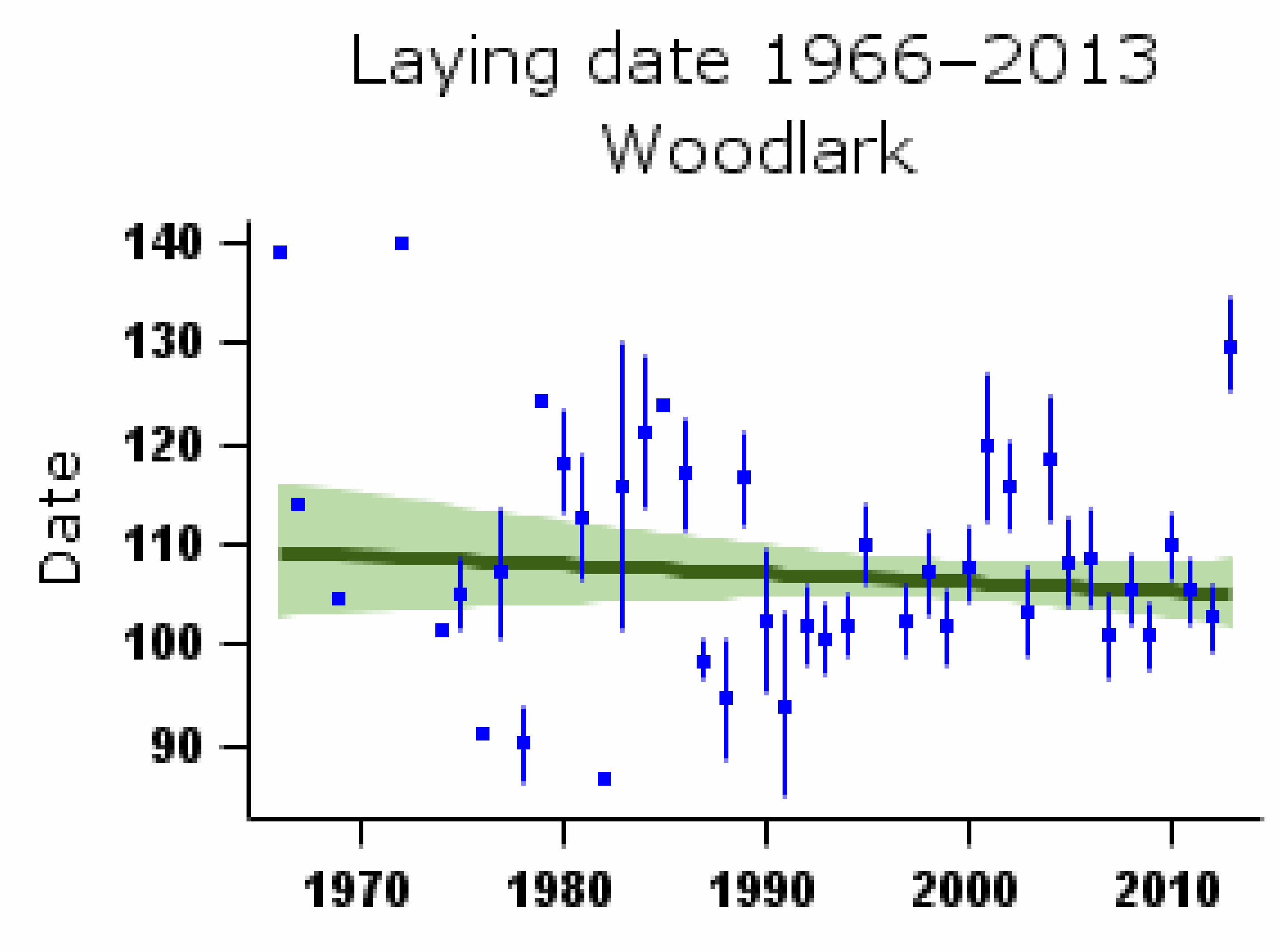
Population changes in detail

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

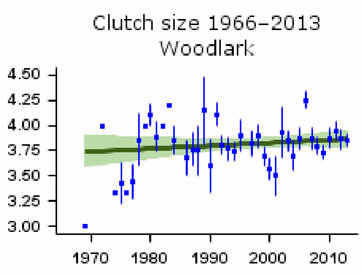


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

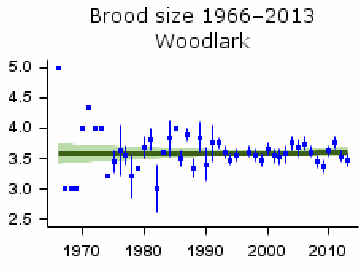
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	22	None					
Clutch size	44	1968-2012	21	None					Small sample
Brood size	44	1968-2012	33	None					
Nest failure rate at egg stage	44	1968-2012	23	Curvilinear	6.09% nests/day	2.69% nests/day	-55.8%		Small sample
Nest failure rate at chick stage	44	1968-2012	34	None					
Laying date	44	1968-2012	22	None			0 days		Small sample

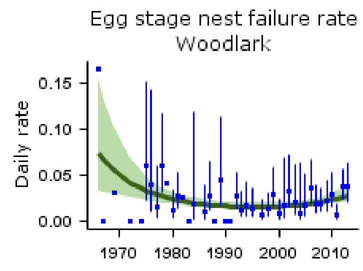
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



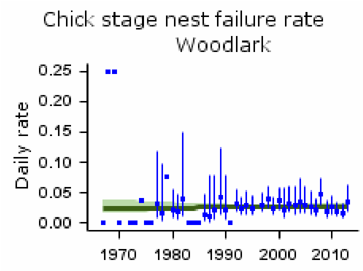
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Skylark

Alauda arvensis

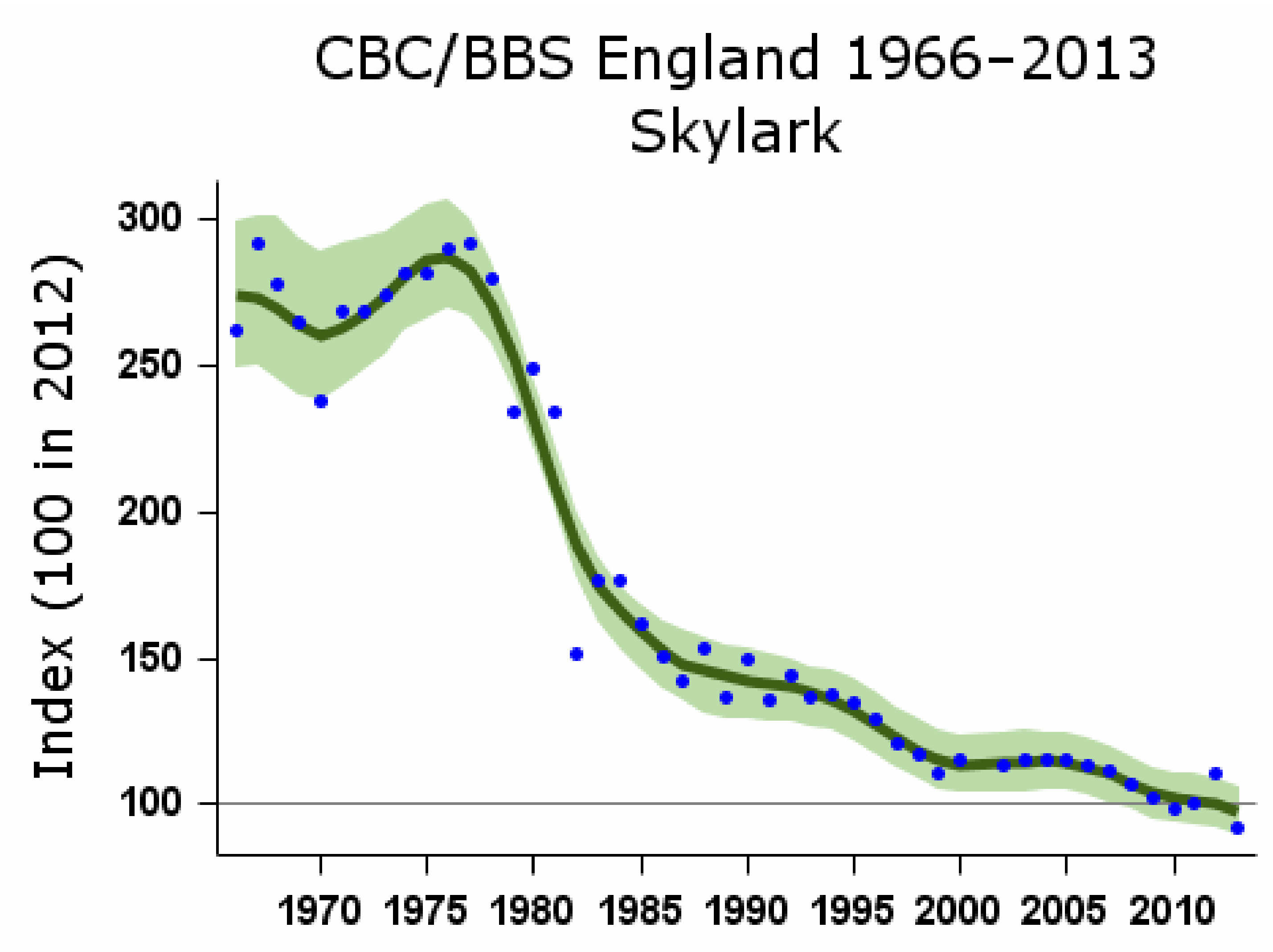
Key facts

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: 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 2014a).



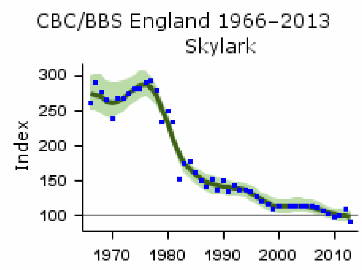
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

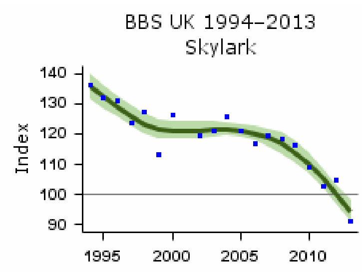
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	45	1967-2012	628	-63	-70	-56	>50	
	25	1987-2012	1039	-33	-39	-23	>25	
	10	2002-2012	1549	-12	-16	-8		
	5	2007-2012	1732	-9	-12	-6		
BBS UK	17	1995-2012	1752	-24	-29	-20		
	10	2002-2012	1916	-18	-22	-13		
	5	2007-2012	2123	-16	-19	-12		
BBS England	17	1995-2012	1401	-25	-29	-21	>25	
	10	2002-2012	1549	-12	-16	-9		
	5	2007-2012	1732	-9	-12	-6		
BBS Scotland	17	1995-2012	212	-27	-36	-14	>25	
	10	2002-2012	220	-26	-33	-18	>25	
	5	2007-2012	247	-30	-36	-22	>25	
BBS Wales	17	1995-2012	103	-5	-22	12		
	10	2002-2012	111	-1	-16	15		
	5	2007-2012	110	4	-9	20		
BBS N.Ireland	17	1995-2012	33	-54	-62	-48	>50	
	10	2002-2012	34	-57	-67	-52	>50	
	5	2007-2012	32	-35	-44	-25	>25	

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

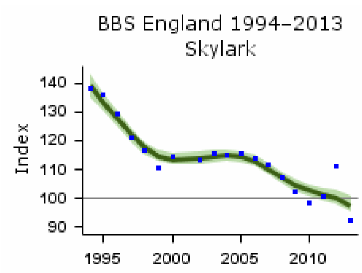
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



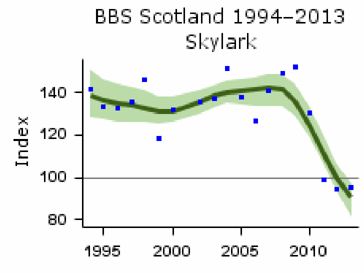
CBC/BBS England graph



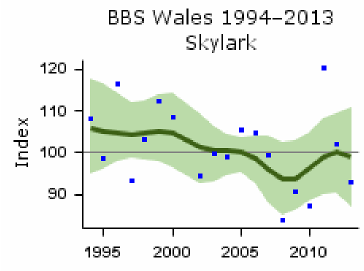
BBS UK graph



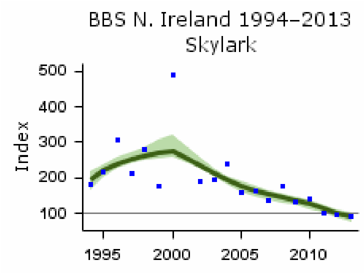
BBS England graph



BBS Scotland graph

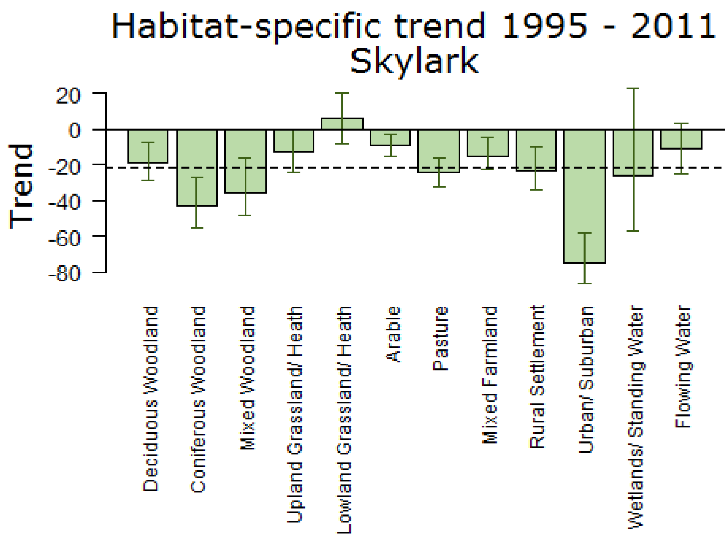


BBS Wales graph



BBS N.Ireland graph

Population trends by habitat



Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

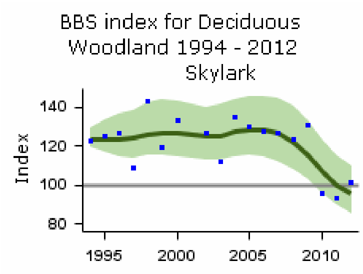
Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

More on habitat trends

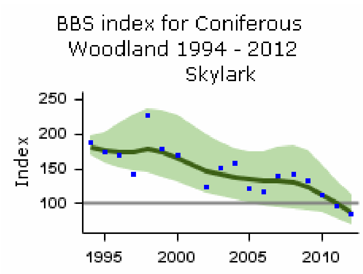
Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	306	-19	-29	-7

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Coniferous Woodland	16	1995-2011	75	-43	-56	-27
Mixed Woodland	16	1995-2011	129	-36	-48	-17
Upland Grassland/ Heath	16	1995-2011	91	-13	-24	0
Lowland Grassland/ Heath	16	1995-2011	155	6	-9	20
Arable	16	1995-2011	659	-9	-15	-3
Pasture	16	1995-2011	738	-24	-32	-16
Mixed Farmland	16	1995-2011	498	-15	-22	-5
Rural Settlement	16	1995-2011	336	-23	-34	-10
Urban/ Suburban	16	1995-2011	61	-75	-86	-58
Wetlands/ Standing Water	16	1995-2011	45	-26	-58	23
Flowing Water	16	1995-2011	233	-11	-25	3

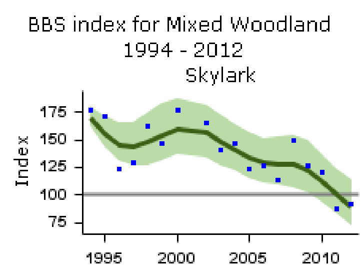
Further information on habitat-specific trends, please follow link here.



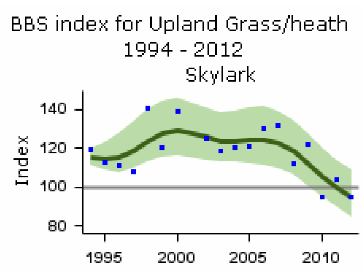
Habitat graph



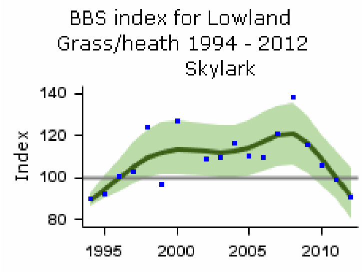
Habitat graph



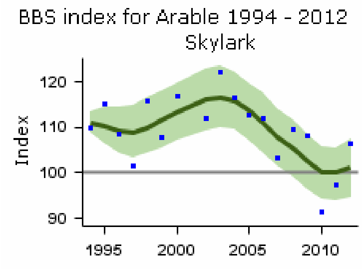
Habitat graph



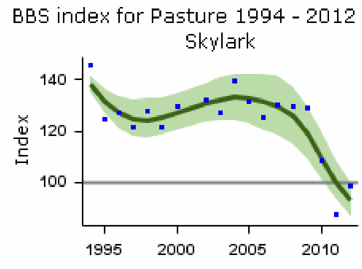
Habitat graph



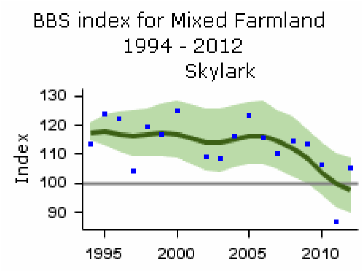
Habitat graph



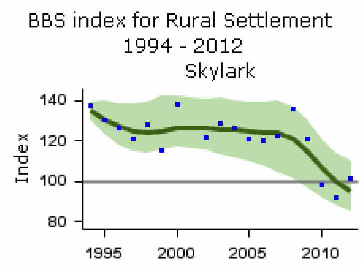
Habitat graph



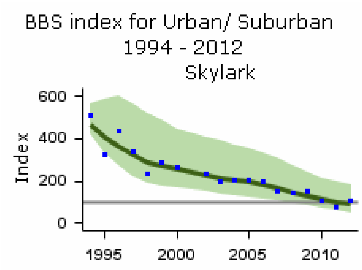
Habitat graph



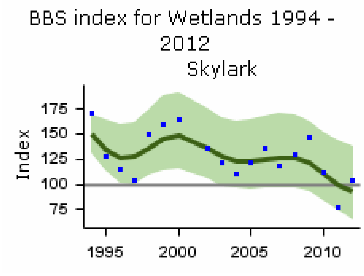
Habitat graph



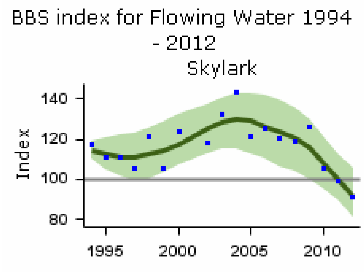
Habitat graph



Habitat graph

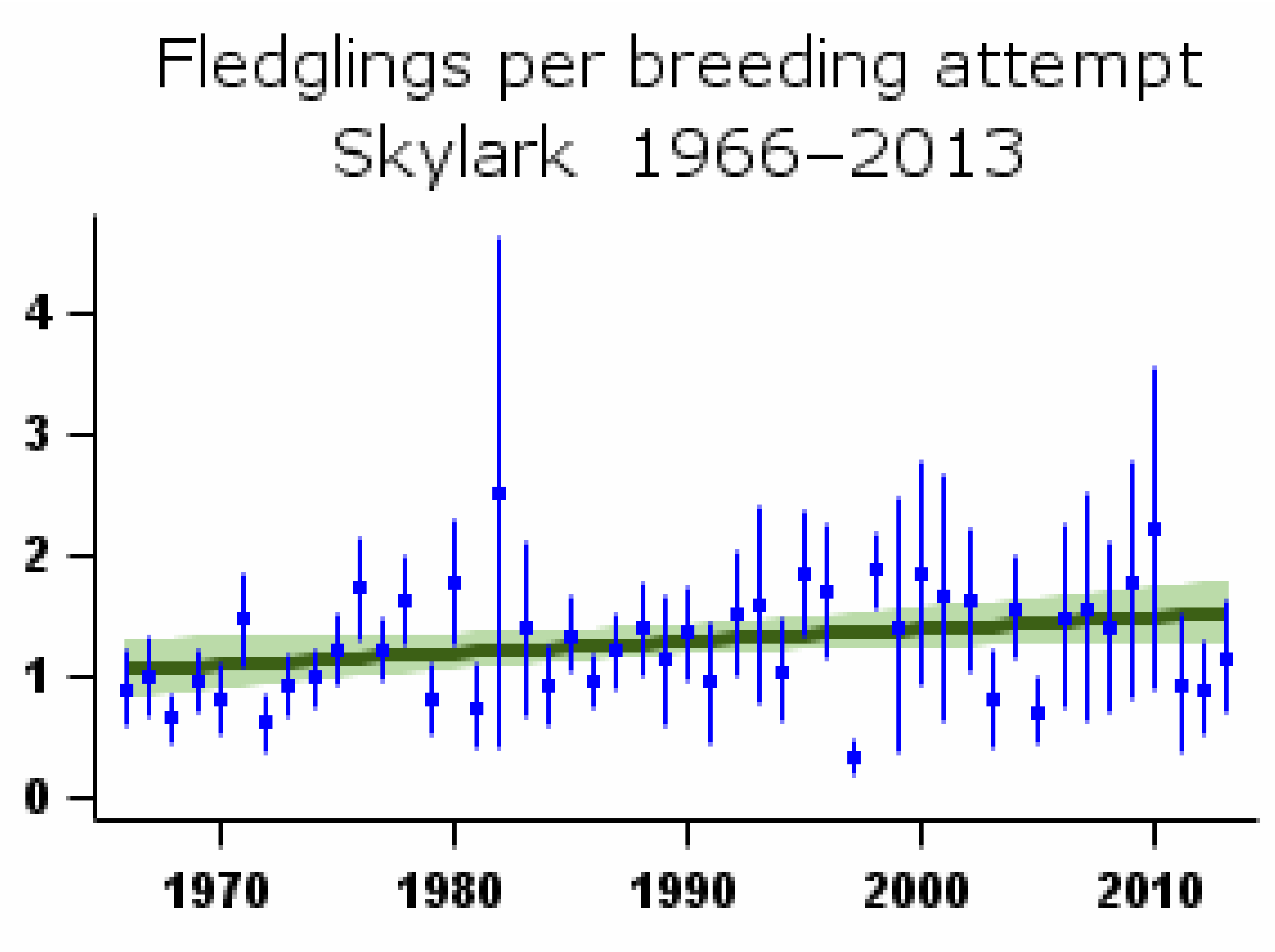


Habitat graph

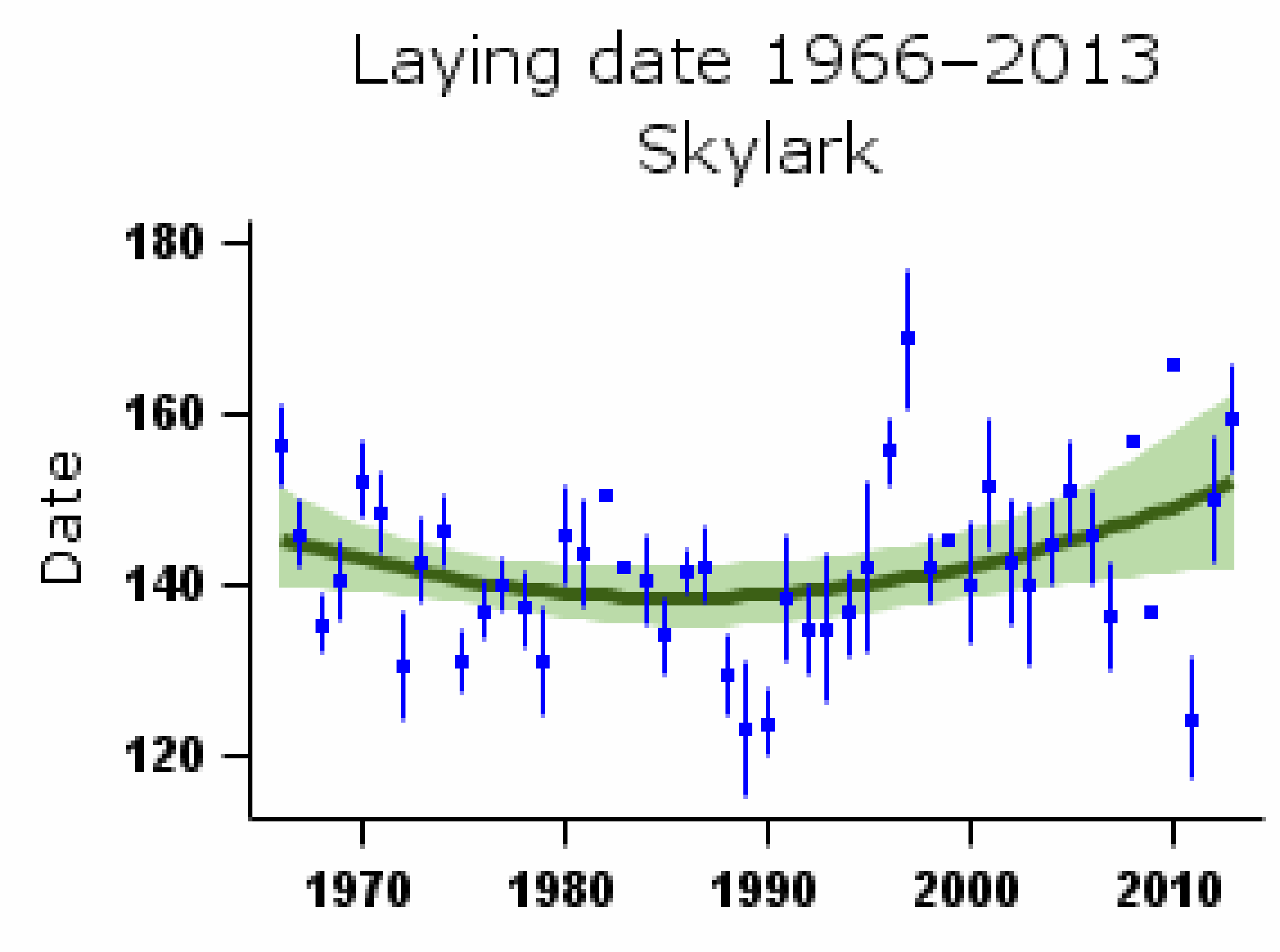


Habitat graph

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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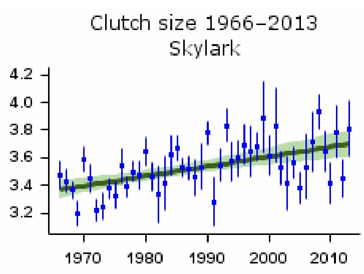
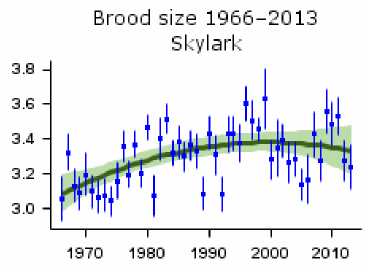
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	42	Linear increase	1.09 fledglings	1.52 fledglings	40.1%		
Clutch size	44	1968-2012	35	Linear increase	3.38 eggs	3.69 eggs	9.1%		
Brood size	44	1968-2012	65	Curvilinear	3.12 chicks	3.34 chicks	7.2%		
Nest failure rate at egg stage	44	1968-2012	44	Curvilinear	3.65% nests/day	4.54% nests/day	24.4%		
Nest failure rate at chick stage	44	1968-2012	53	Linear decline	4.78% nests/day	3.02% nests/day	-36.8%		
Laying date	44	1968-2012	19	Curvilinear	May 24	May 31	7 days		Small sample

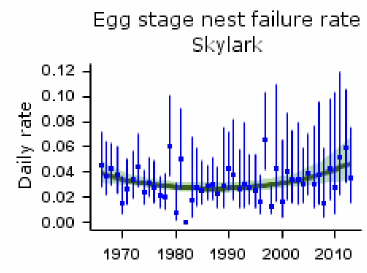
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



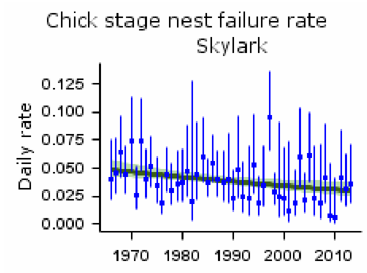
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



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

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.

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Sand Martin

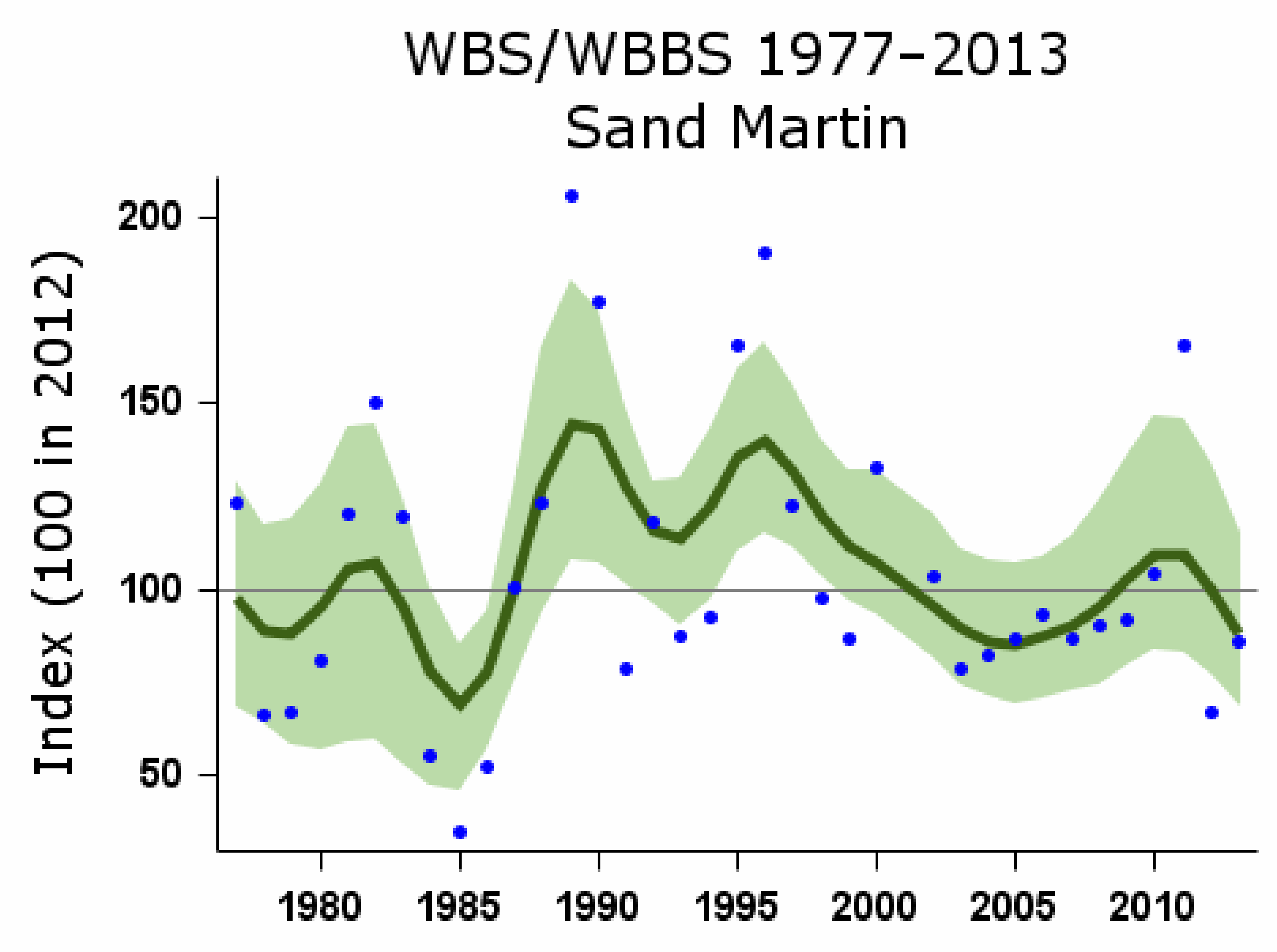
Riparia riparia

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 were of apparently occupied nest holes along riverbanks but BBS and WBBS record birds seen. WBS/WBBS suggests 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 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; 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). Mark-recapture in Cheshire during 1981-2003 found that, after allowing for the effects of African rainfall, some demographic measures were density dependent, with adult survival low when wintering densities (measured as the size of the western European population) were high and recruitment low when the local Cheshire population was high (Norman & Peach 2013). This study did not replicate an earlier finding (Cowley & Siriwardena 2005) that summer rainfall on the breeding grounds has a negative influence on survival rates through the following winter.



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

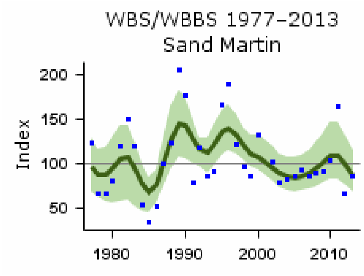
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
WBS/WBBS waterways	34	1978-2012	47	13	-29	119		

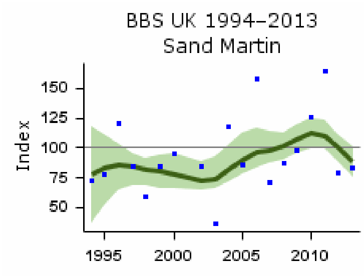
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	25	1987-2012	59	-1	-40	86		
	10	2002-2012	92	5	-23	41		
	5	2007-2012	83	11	-7	32		
BBS UK	17	1995-2012	134	20	-18	120		
	10	2002-2012	150	37	2	77		
	5	2007-2012	171	1	-17	23		
BBS England	17	1995-2012	86	4	-30	29		
	10	2002-2012	95	0	-26	21		
	5	2007-2012	104	-8	-28	12		
BBS Scotland	17	1995-2012	31	42	-21	319		
	10	2002-2012	36	119	37	218		
	5	2007-2012	47	11	-22	57		

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

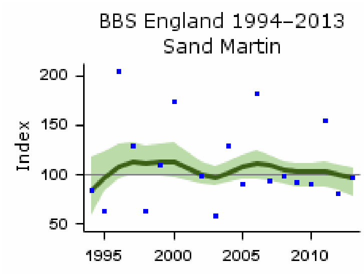
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



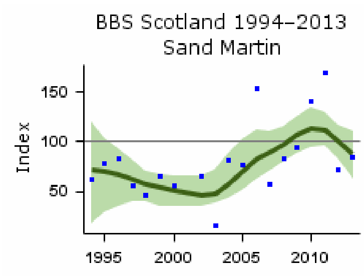
WBS/WBBS waterways graph



BBS UK graph

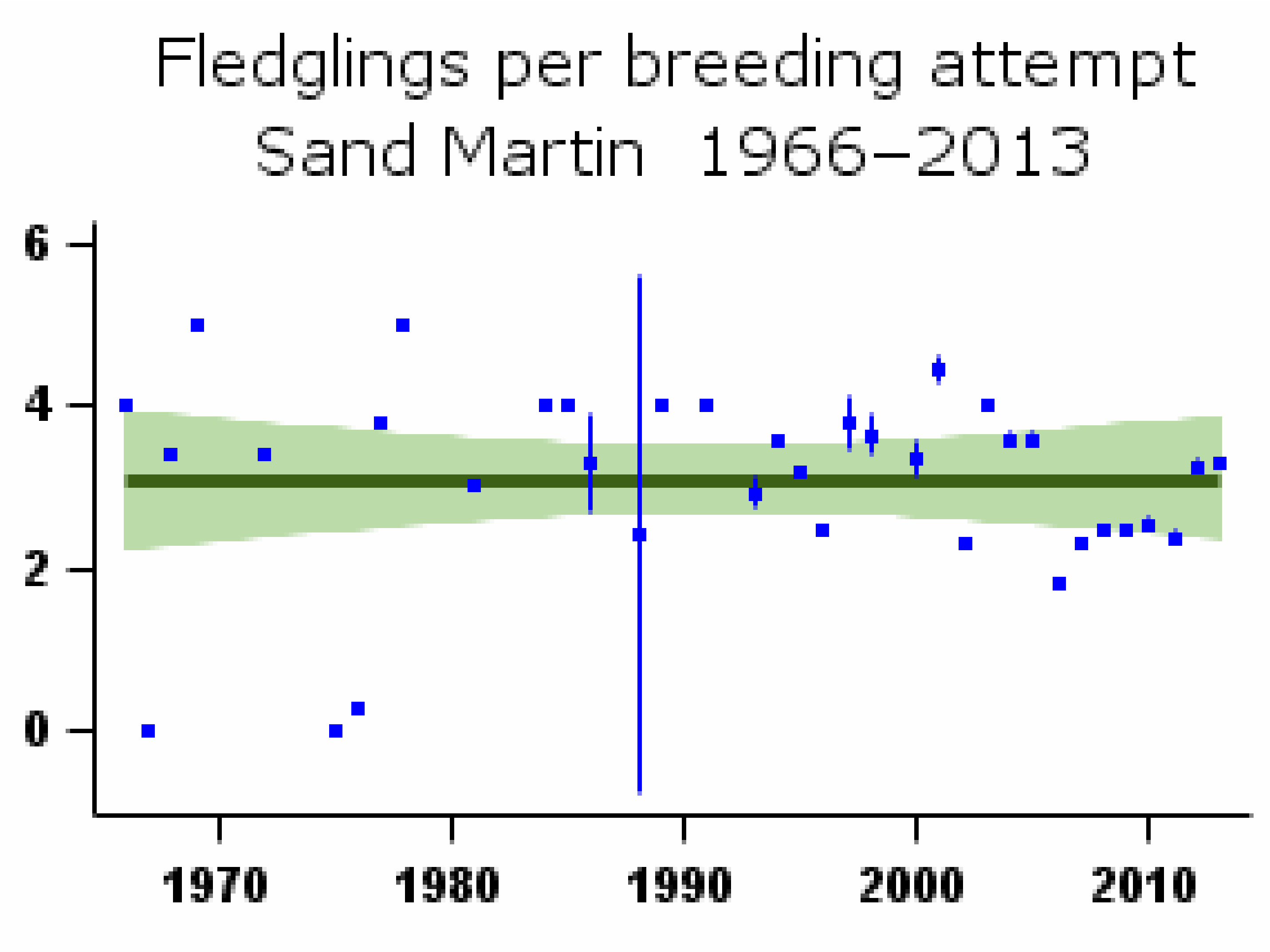


BBS England graph

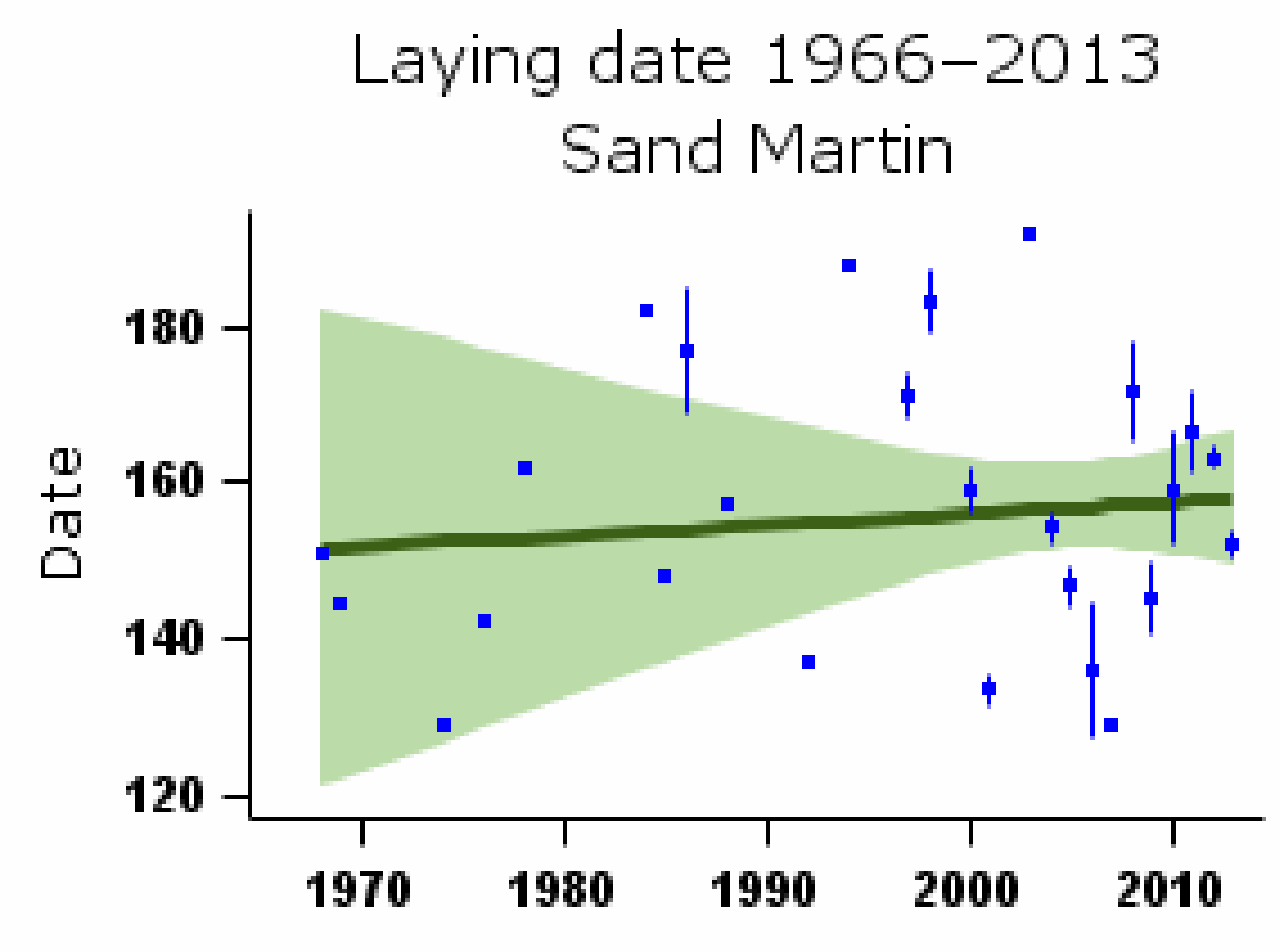


BBS Scotland graph

Demographic trends



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

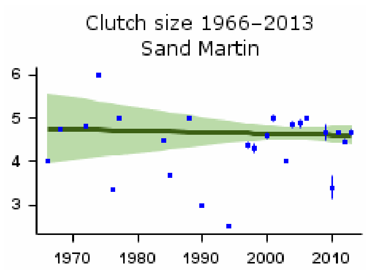


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

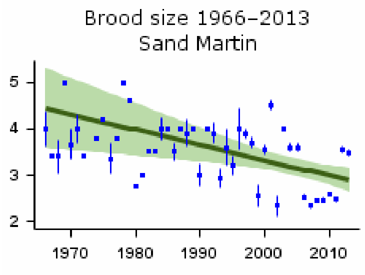
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	42	None					
Clutch size	44	1968-2012	47	None					
Brood size	44	1968-2012	64	Linear decline	4.37 chicks	2.92 chicks	-33.3%		
Nest failure rate at egg stage	44	1968-2012	43	Curvilinear	1.85% nests/day	0.36% nests/day	-80.5%		
Nest failure rate at chick stage	44	1968-2012	69	Linear decline	1.06% nests/day	0.06% nests/day	-94.3%		
Laying date	44	1968-2012	48	None			0 days		

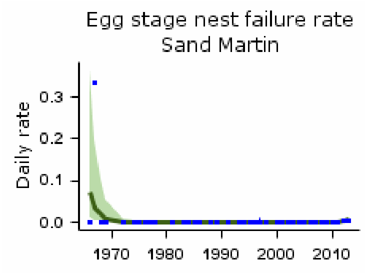
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



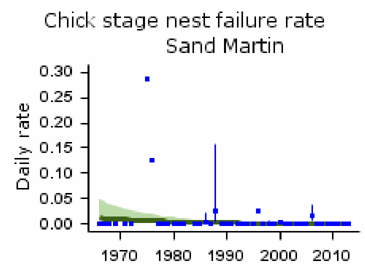
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



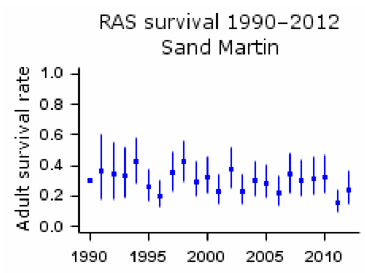
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



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



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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Swallow

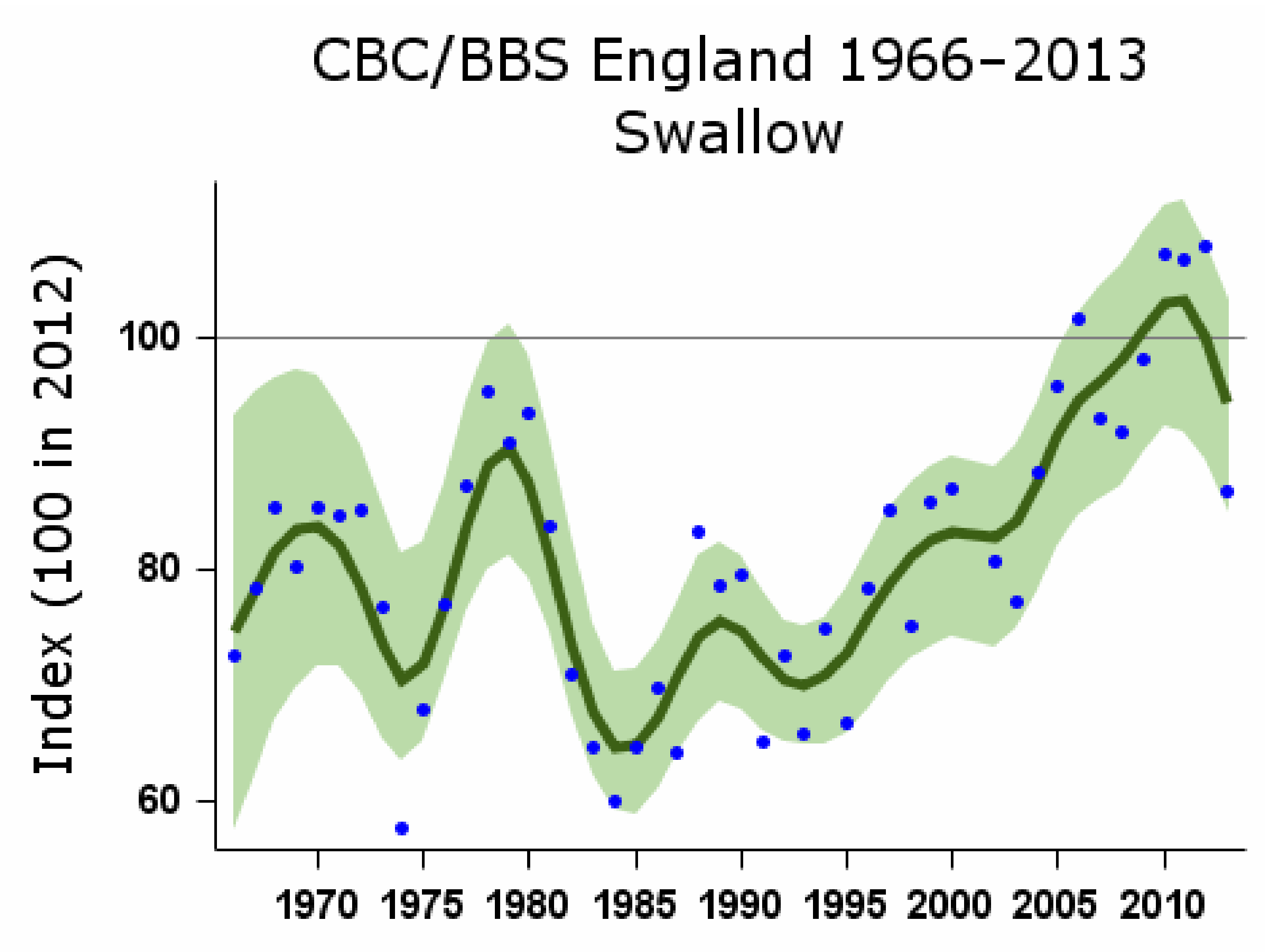
Hirundo rustica

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 decline on CBC plots in the early 1980s, but continues to qualify through its widespread decline across the European continent (BirdLife International 2004). Numbers across Europe have shown little change in the period since 1980, however (PECBMS 2014a). Later modelling of UK population change from CBC gave evidence of fluctuations but not for long-term decline (Robinson et al. 2003). BBS data suggest increases in England, Scotland and Wales since 1994. The BBS Robinson et al. 2014), most likely on their wintering grounds (Baillie & Peach 1992). More particularly, 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). Brood size increased up to the late 1980s, and may now be falling again, while nest losses have increased and the number of fledglings per breeding attempt shows 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).



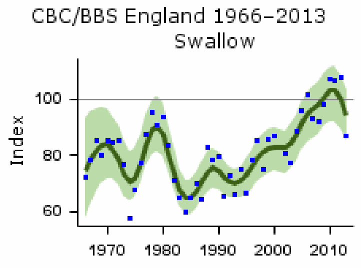
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

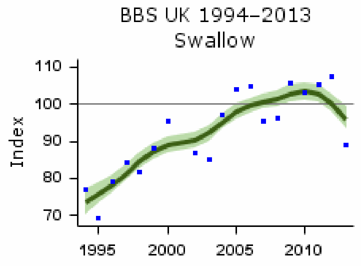
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	45	1967-2012	647	27	-6	81		
	25	1987-2012	1114	42	18	66		
	10	2002-2012	1746	21	15	28		
	5	2007-2012	1981	4	0	8		
BBS UK	17	1995-2012	1991	32	26	40		
	10	2002-2012	2261	11	6	16		
	5	2007-2012	2540	-1	-4	4		
BBS England	17	1995-2012	1537	35	27	43		
	10	2002-2012	1746	20	15	27		
	5	2007-2012	1981	4	0	8		
BBS Scotland	17	1995-2012	181	37	12	58		
	10	2002-2012	204	10	-7	28		
	5	2007-2012	240	0	-15	13		
BBS Wales	17	1995-2012	173	38	19	61		
	10	2002-2012	195	0	-12	18		
	5	2007-2012	198	-3	-13	9		
BBS N.Ireland	17	1995-2012	85	0	-22	32		
	10	2002-2012	99	-24	-32	-13		
	5	2007-2012	104	-24	-30	-16		

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

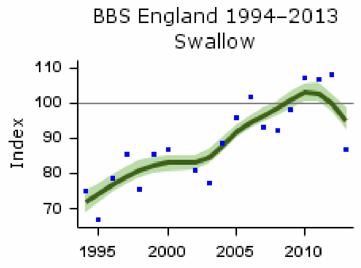
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



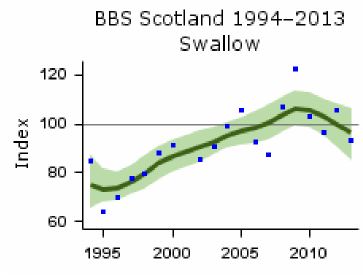
CBC/BBS England graph



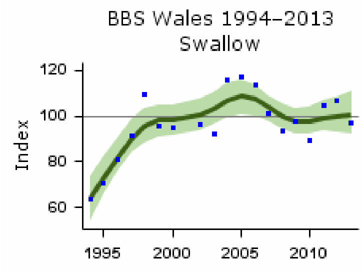
BBS UK graph



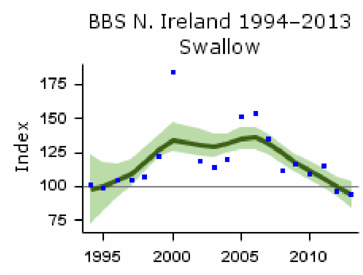
BBS England graph



BBS Scotland graph

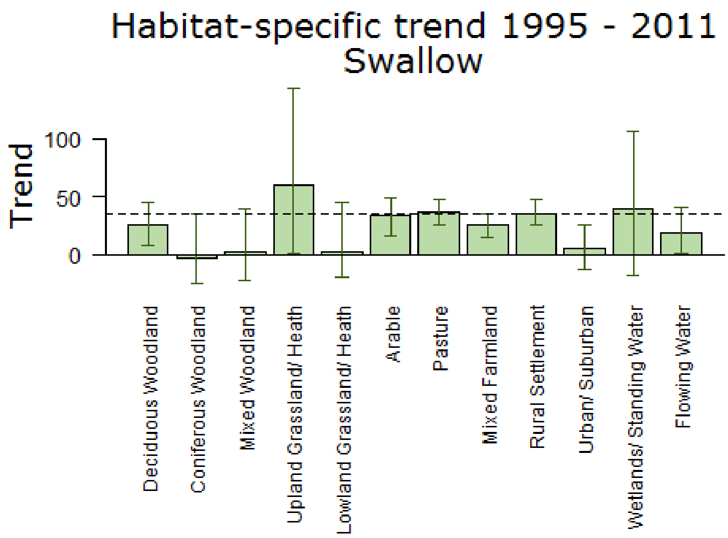


BBS Wales graph



BBS N.Ireland graph

Population trends by habitat



Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

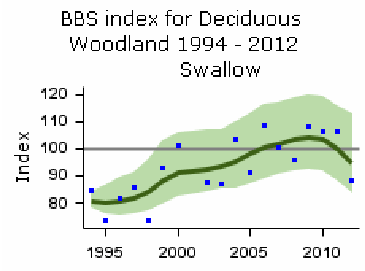
Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

More on habitat trends

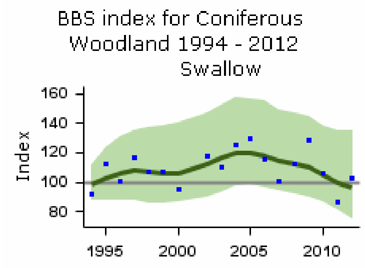
Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	374	25	8	45

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Coniferous Woodland	16	1995-2011	82	3	-24	35
Mixed Woodland	16	1995-2011	166	3	-21	40
Upland Grassland/ Heath	16	1995-2011	44	59	1	143
Lowland Grassland/ Heath	16	1995-2011	114	3	-19	45
Arable	16	1995-2011	504	34	16	50
Pasture	16	1995-2011	1076	37	26	47
Mixed Farmland	16	1995-2011	523	26	15	36
Rural Settlement	16	1995-2011	685	36	26	47
Urban/ Suburban	16	1995-2011	186	6	-13	25
Wetlands/ Standing Water	16	1995-2011	67	40	-18	106
Flowing Water	16	1995-2011	319	19	1	40

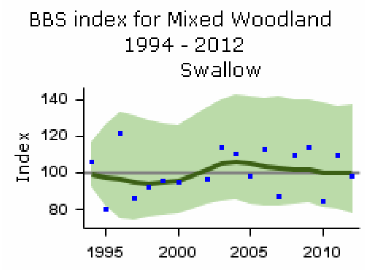
Further information on habitat-specific trends, please follow link here.



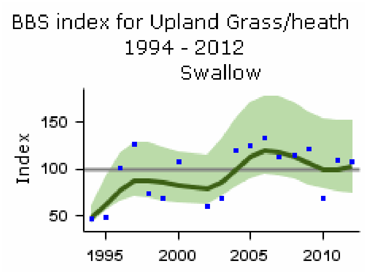
Habitat graph



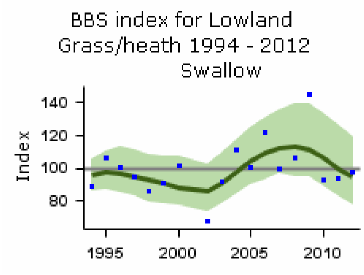
Habitat graph



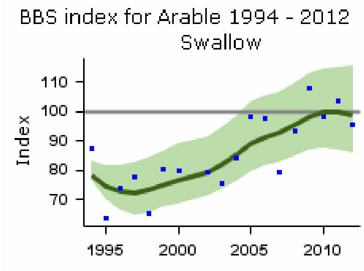
Habitat graph



Habitat graph



Habitat graph



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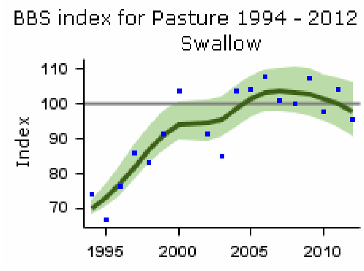
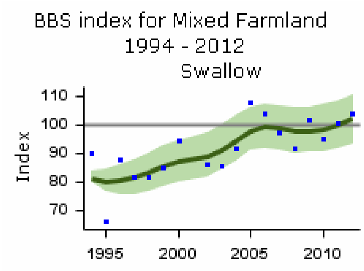
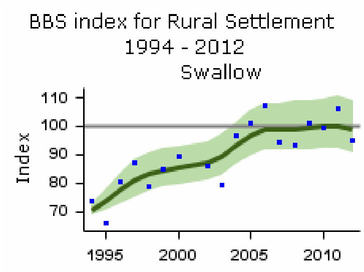


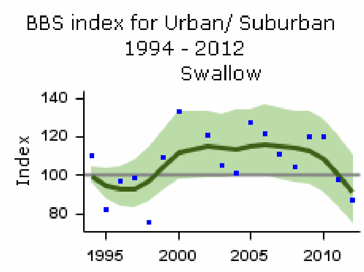
Habitat graph



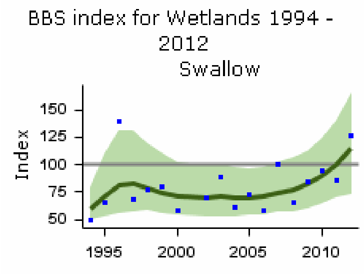
Habitat graph



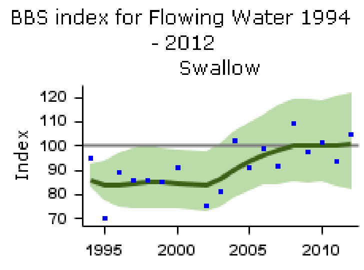
Habitat graph



Habitat graph

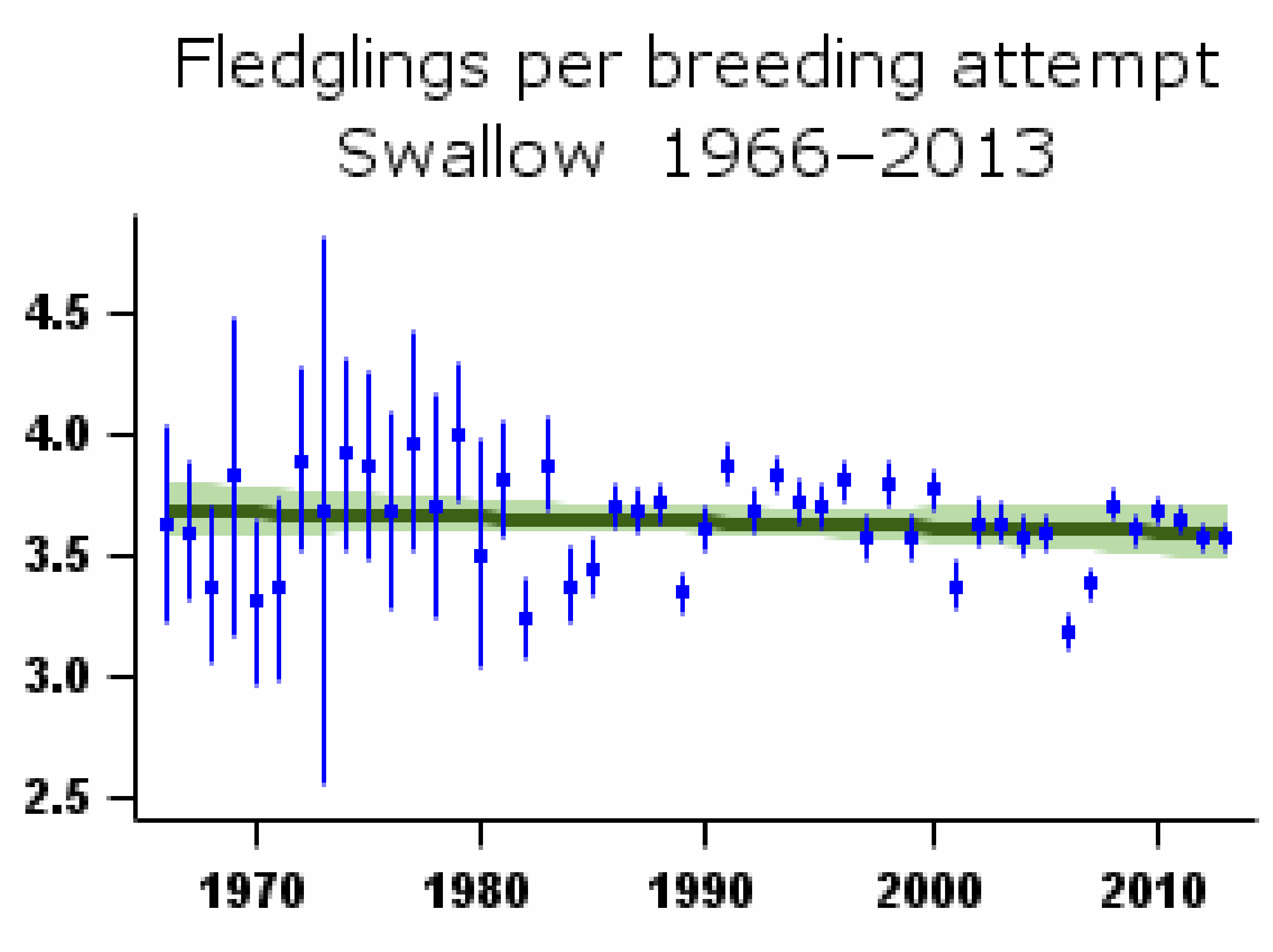


Habitat graph

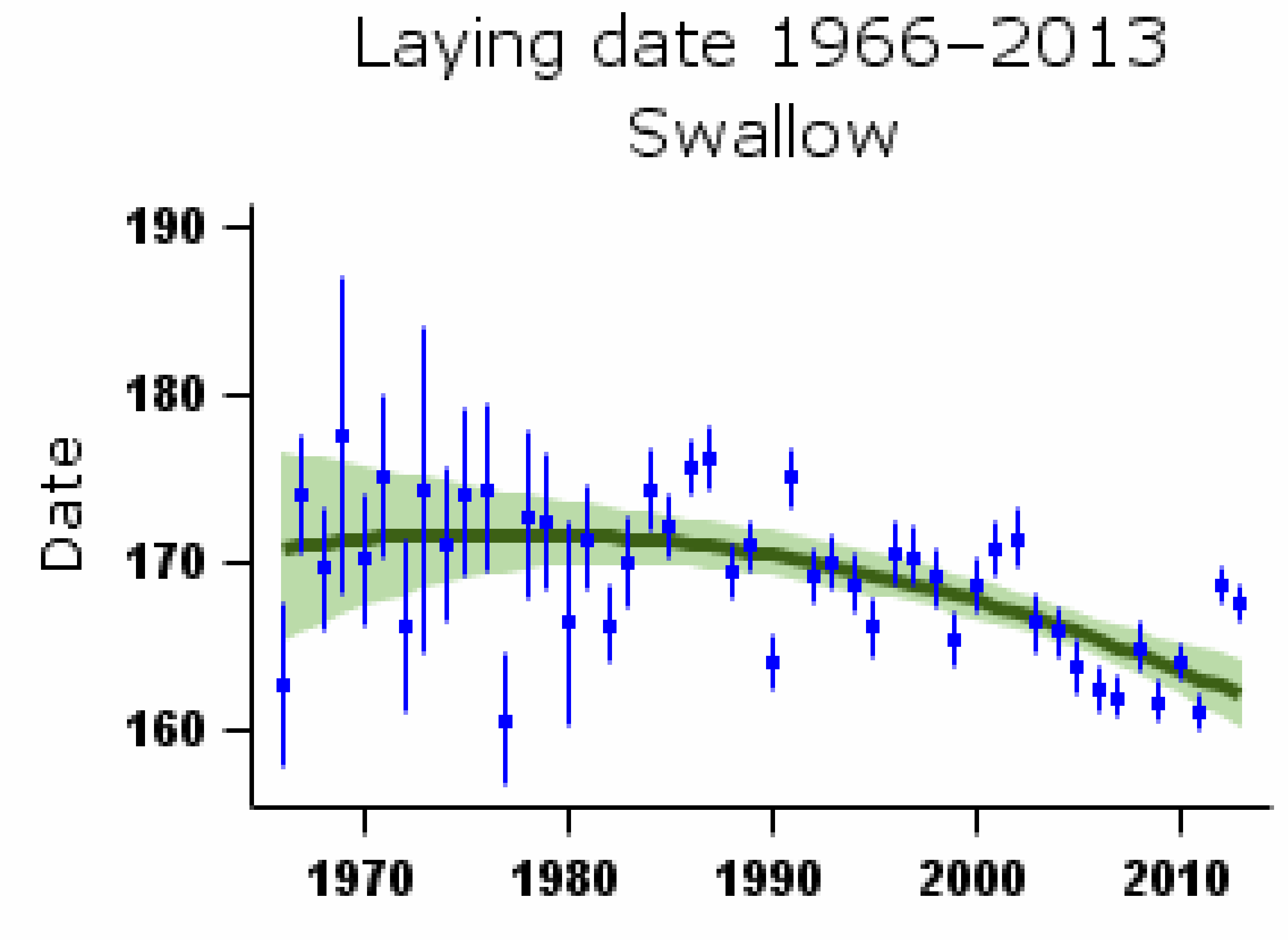


Habitat graph

Demographic trends



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

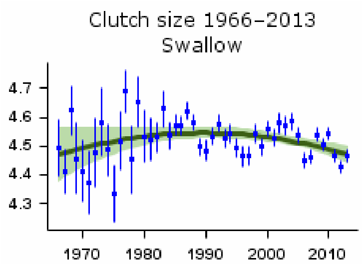


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

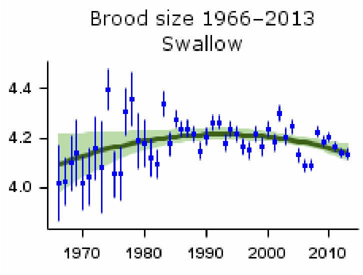
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	512	None					
Clutch size	44	1968-2012	488	Curvilinear	4.48 eggs	4.48 eggs	-0.1%		
Brood size	44	1968-2012	845	Curvilinear	4.11 chicks	4.15 chicks	0.9%		
Nest failure rate at egg stage	44	1968-2012	600	None					
Nest failure rate at chick stage	44	1968-2012	512	Linear increase	0.32% nests/day	0.43% nests/day	34.4%		
Laying date	44	1968-2012	214	Curvilinear	Jun 20	Jun 12	-8 days		

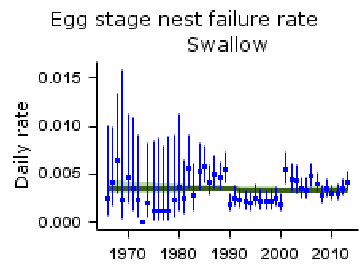
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



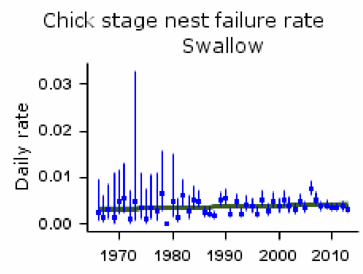
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



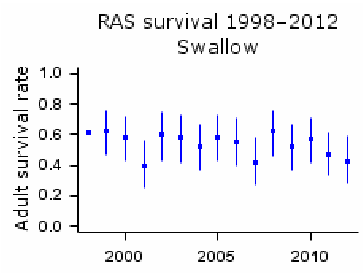
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



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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House Martin

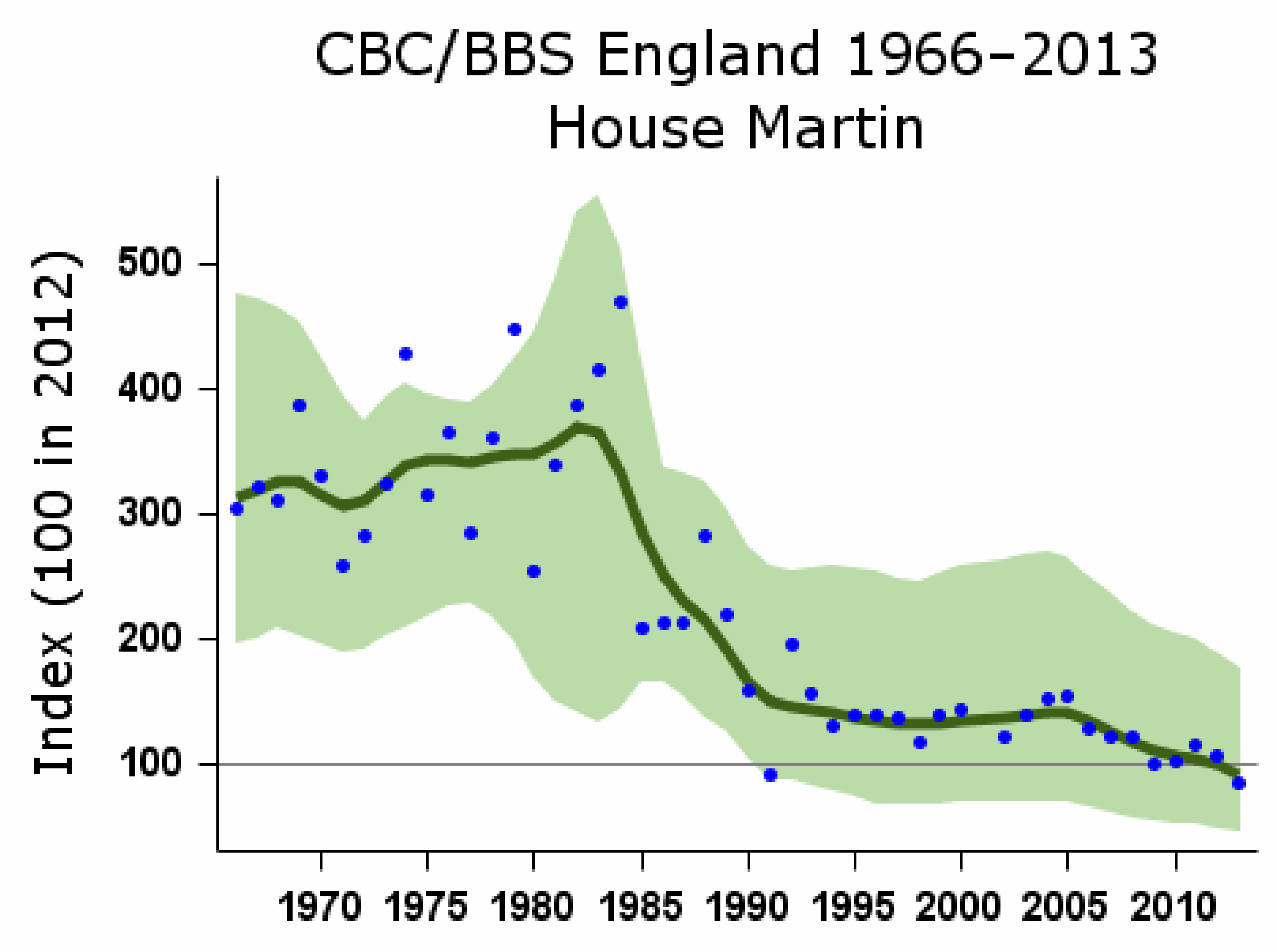
Delichon urbicum

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. A first national survey designed on these principles will be undertaken by BTO in 2015-16 (see BirdLife International 2004). There has been widespread moderate decline across Europe since 1980, though with little change since 1995 (PECBMS 2014a). 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

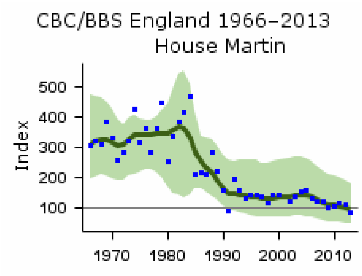
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	45	1967-2012	304	-69	-88	-7	>50	Small CBC sample
	25	1987-2012	532	-57	-82	3		Small CBC sample
	10	2002-2012	813	-27	-33	-19	>25	
	5	2007-2012	855	-21	-26	-16		

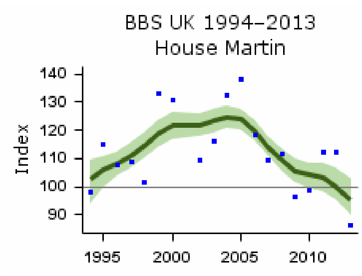
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	17	1995-2012	947	-5	-13	6		
	10	2002-2012	1044	-18	-25	-10		
	5	2007-2012	1101	-12	-19	-5		
BBS England	17	1995-2012	742	-27	-34	-16	>25	
	10	2002-2012	813	-28	-34	-20	>25	
	5	2007-2012	855	-21	-26	-15		
BBS Scotland	17	1995-2012	67	125	40	216		
	10	2002-2012	78	4	-26	55		
	5	2007-2012	94	-1	-22	31		
BBS Wales	17	1995-2012	88	1	-25	38		
	10	2002-2012	94	-14	-29	6		
	5	2007-2012	92	-3	-23	16		
BBS N.Ireland	17	1995-2012	43	82	16	186		
	10	2002-2012	52	18	-10	49		
	5	2007-2012	55	26	0	53		

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

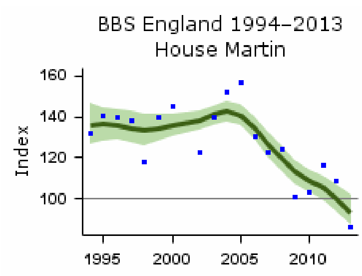
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



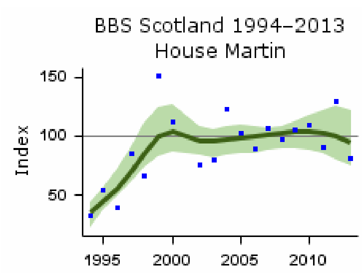
CBC/BBS England graph



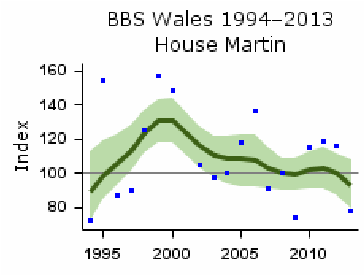
BBS UK graph



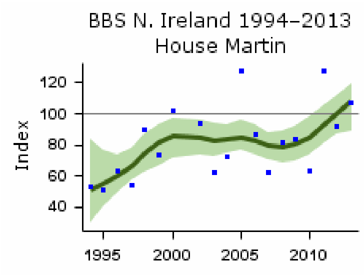
BBS England graph



BBS Scotland graph

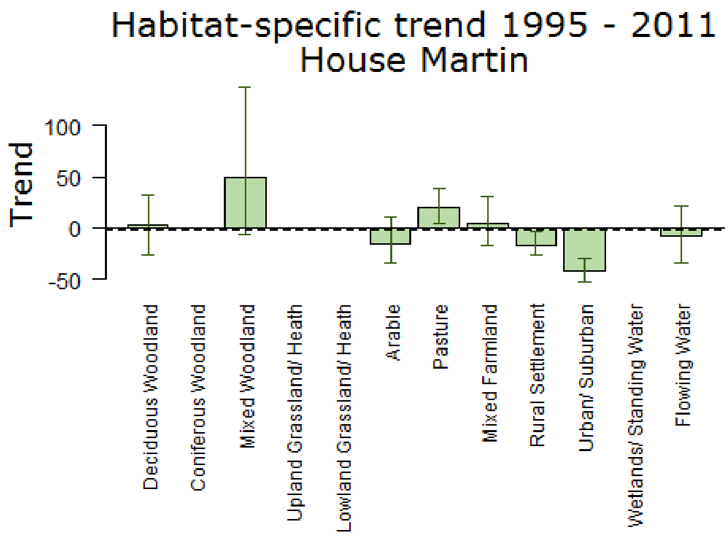


BBS Wales graph



BBS N.Ireland graph

Population trends by habitat



Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

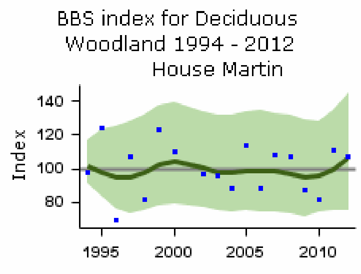
Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

More on habitat trends

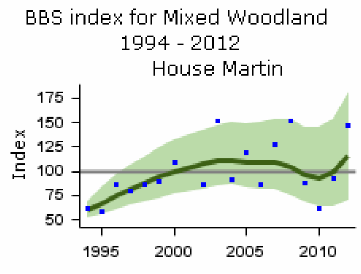
Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	111	2	-26	33
Mixed Woodland	16	1995-2011	49	50	-7	137
Arable	16	1995-2011	161	-15	-35	11
Pasture	16	1995-2011	412	19	4	38
Mixed Farmland	16	1995-2011	164	4	-16	31
Rural Settlement	16	1995-2011	321	-17	-27	-4
Urban/ Suburban	16	1995-2011	174	-42	-52	-30
Flowing Water	16	1995-2011	120	-7	-35	22

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit

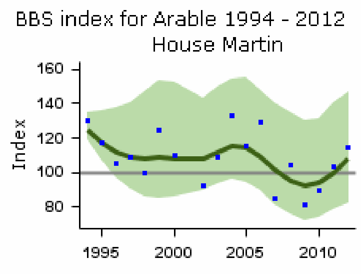
Further information on habitat-specific trends, please follow link here.



Habitat graph



Habitat graph



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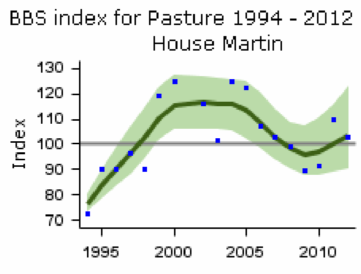

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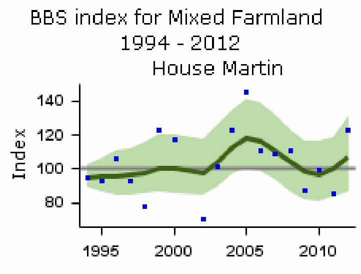

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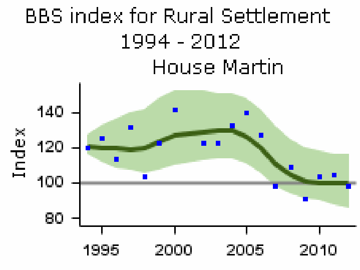

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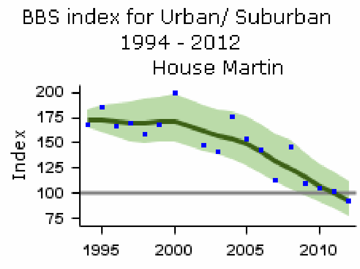
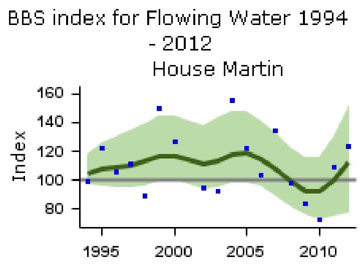


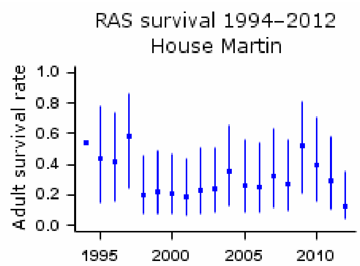
Habitat graph



Habitat 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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Cetti's Warbler

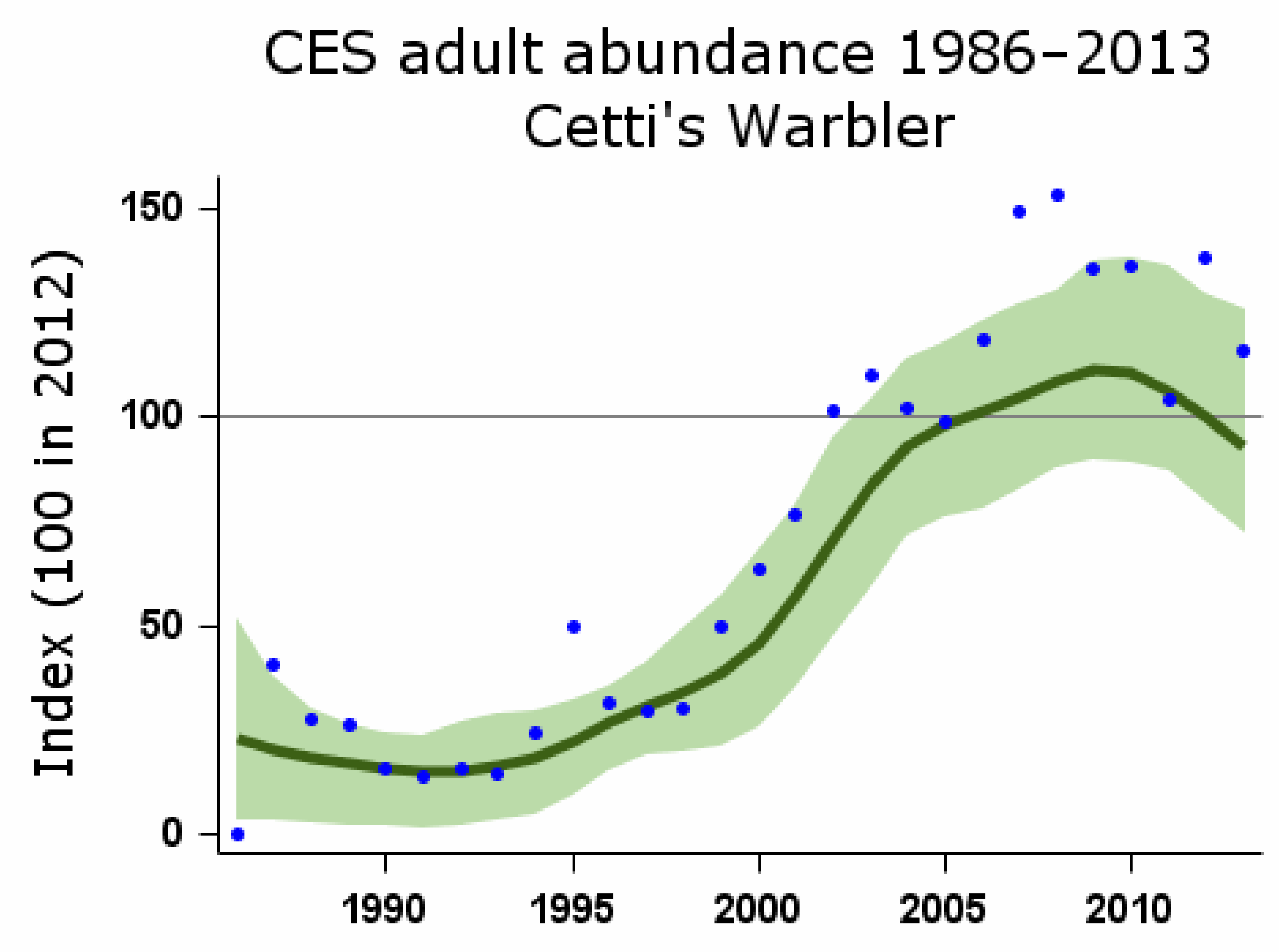
Cettia cetti

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 Warbler was first recorded in Britain as recently as 1961, as part of its 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 2014. 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. The index has fallen owing to cold winters since 2010. Numbers have shown a widespread moderate increase across Europe since 1989, but with little change since 1997 (PECBMS 2014a).



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

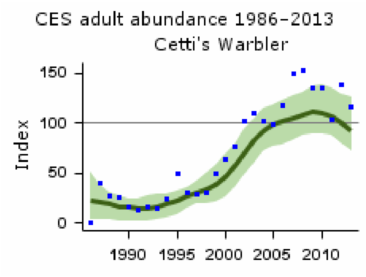
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CES adults	25	1987-2012	10	171	25	791		Small sample
	10	2002-2012	15	40	-11	172		Small sample

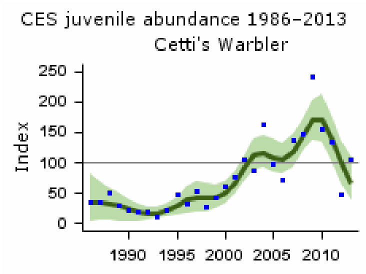
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CES juveniles	25	1987-2012	10	186	-3	3579		Small sample
	10	2002-2012	16	10	-41	100		Small sample
	5	2007-2012	20	-16	-54	39		

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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Long-tailed Tit

Aegithalos caudatus

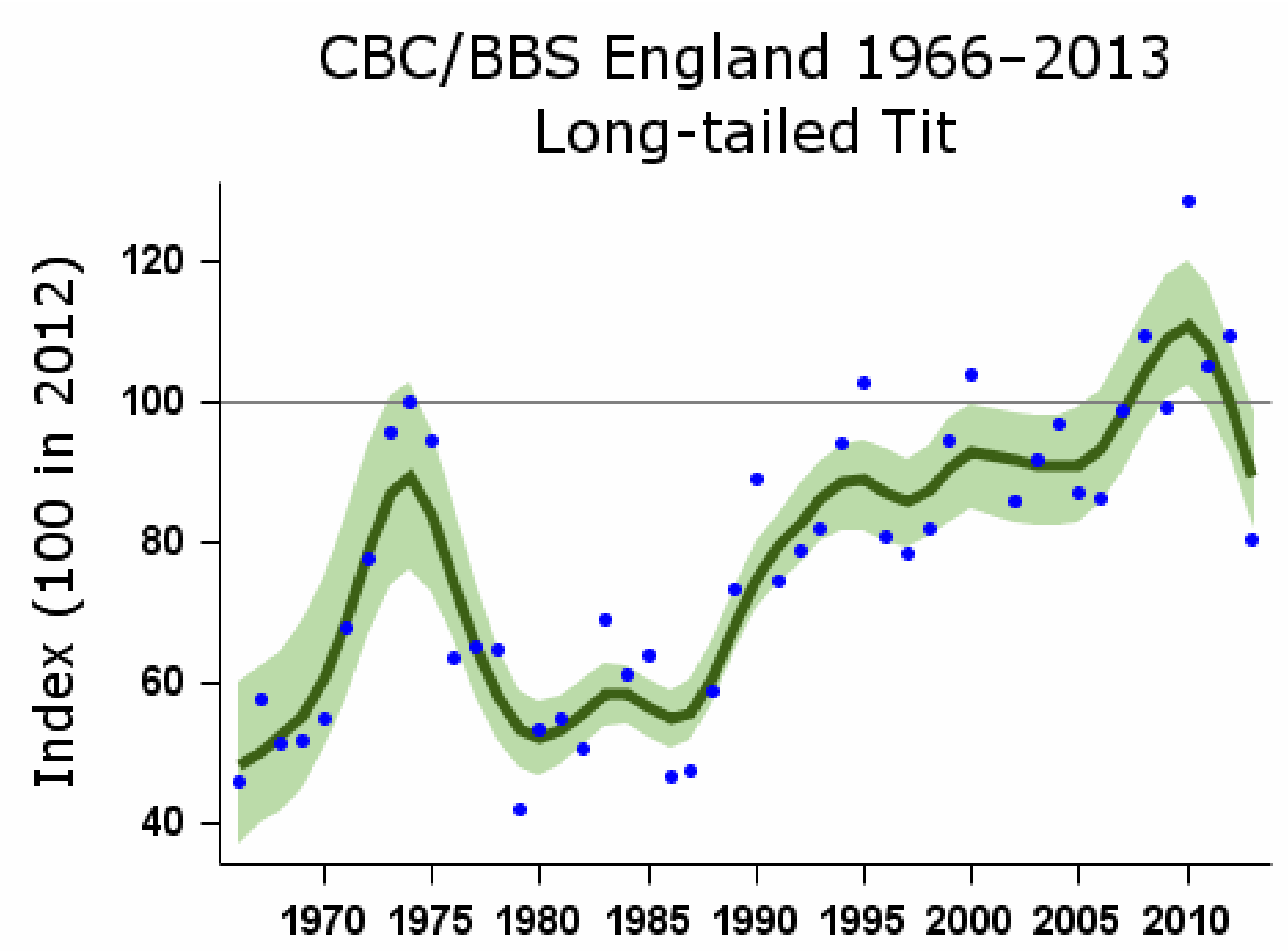
Key facts

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: moderate 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 in some years but able to recover quickly by virtue of its high breeding potential. In a mark-recapture study near Sheffield during 1994-2012, weather explained 73% of the inter-annual variation in adult survival: warm springs and autumns increased survival, wet springs reduced survival but, during the period of study, winter weather had little effect (Gullett et al. 2014). Numbers were low, however, after the severe winters of the early 1960s and again during a series of relatively cold winters beginning in the late 1970s, and have fallen again after the cold winters since 2010.

The starting years of the 25-year and longest monitoring periods coincide 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 across Europe have shown little change since 1980 (PECBMS 2014a).



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

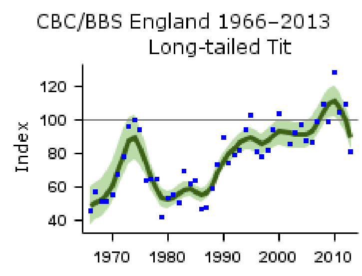
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	45	1967-2012	420	98	45	183		
	25	1987-2012	672	79	57	104		

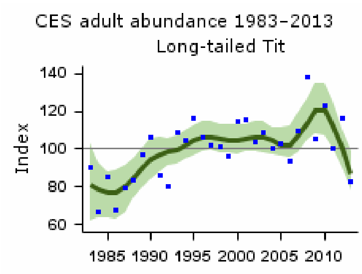
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	5	2007-2012	1181	2	-3	7		
CES adults	28	1984-2012	81	27	-3	74		
	25	1987-2012	88	25	1	67		
	10	2002-2012	93	-6	-18	10		
	5	2007-2012	92	-6	-17	3		
CES juveniles	28	1984-2012	76	15	-20	84		
	25	1987-2012	82	39	-1	109		
	10	2002-2012	89	-29	-43	-12	>25	
	5	2007-2012	89	-37	-47	-26	>25	
BBS UK	17	1995-2012	969	15	7	28		
	10	2002-2012	1137	9	4	18		
	5	2007-2012	1325	2	-2	8		
BBS England	17	1995-2012	858	10	3	21		
	10	2002-2012	1008	9	4	17		
	5	2007-2012	1181	1	-2	7		
BBS Scotland	17	1995-2012	31	38	-6	115		
	10	2002-2012	36	-6	-27	55		
	5	2007-2012	45	3	-17	60		
BBS Wales	17	1995-2012	61	26	2	70		
	10	2002-2012	68	33	6	74		
	5	2007-2012	73	-10	-24	17		

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

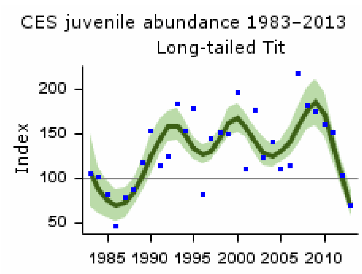
BTO JNCC rspb The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



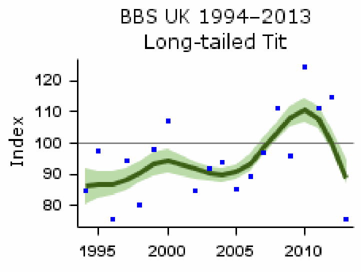
CBC/BBS England graph



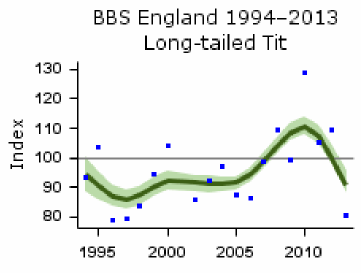
CES adults graph



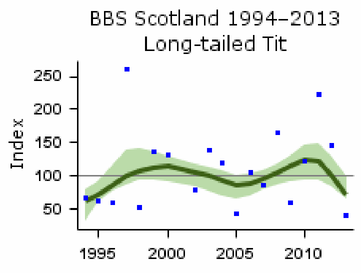
CES juveniles graph



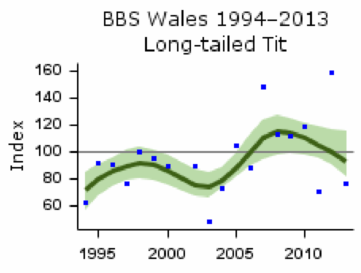
BBS UK graph



BBS England graph

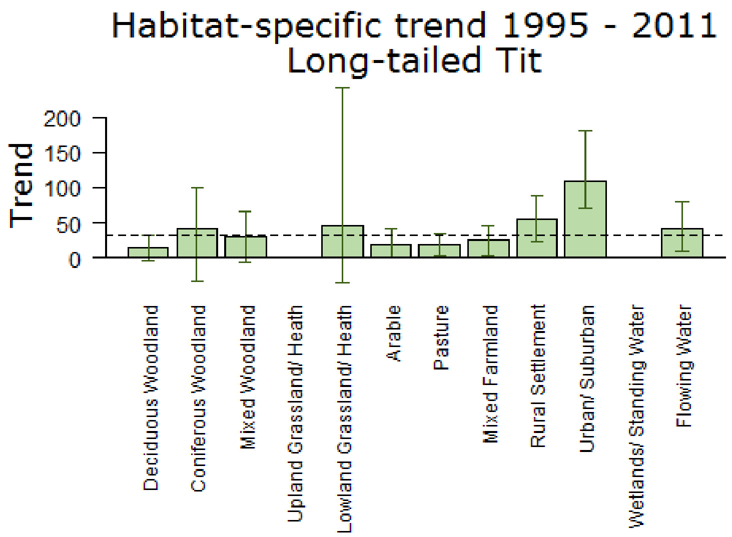


BBS Scotland graph



BBS Wales graph

Population trends by habitat



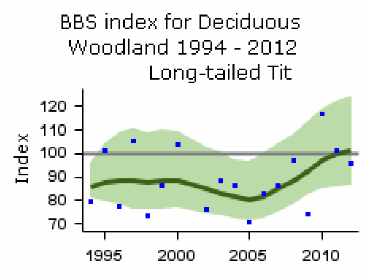
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

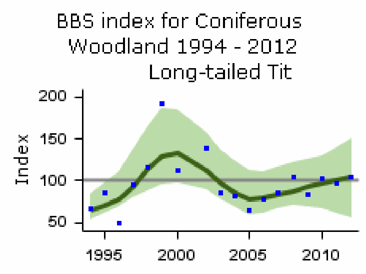
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	257	14	-3	32
Coniferous Woodland	16	1995-2011	33	42	-32	101
Mixed Woodland	16	1995-2011	125	31	-7	66
Lowland Grassland/ Heath	16	1995-2011	30	45	-34	241
Arable	16	1995-2011	190	20	2	42
Pasture	16	1995-2011	337	19	3	35
Mixed Farmland	16	1995-2011	137	26	3	47
Rural Settlement	16	1995-2011	173	54	24	90
Urban/ Suburban	16	1995-2011	111	109	70	180
Flowing Water	16	1995-2011	135	42	9	80

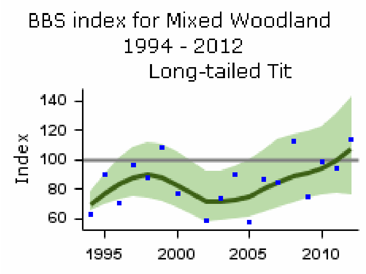
Further information on habitat-specific trends, please follow link here.



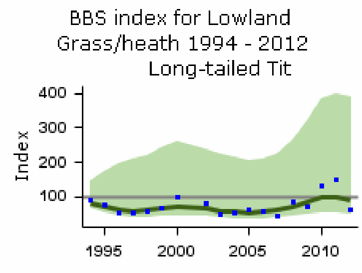
Habitat graph



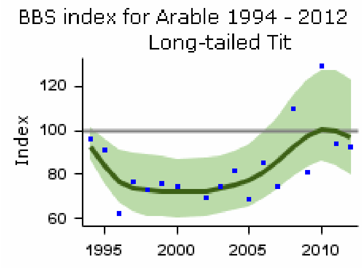
Habitat graph



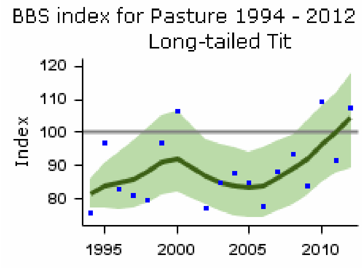
Habitat graph



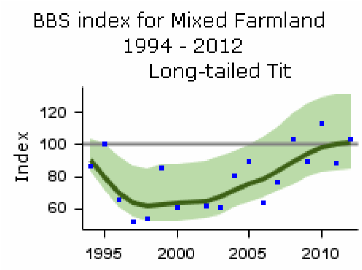
Habitat graph



Habitat graph



Habitat graph



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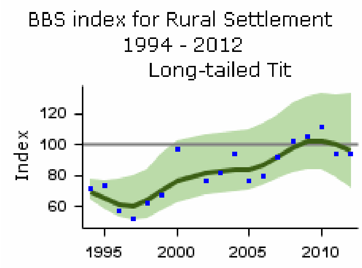

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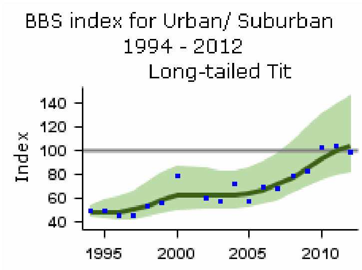
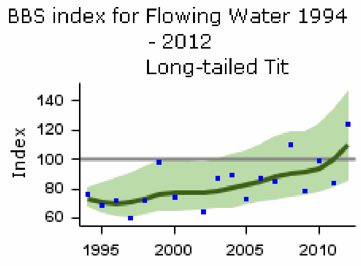
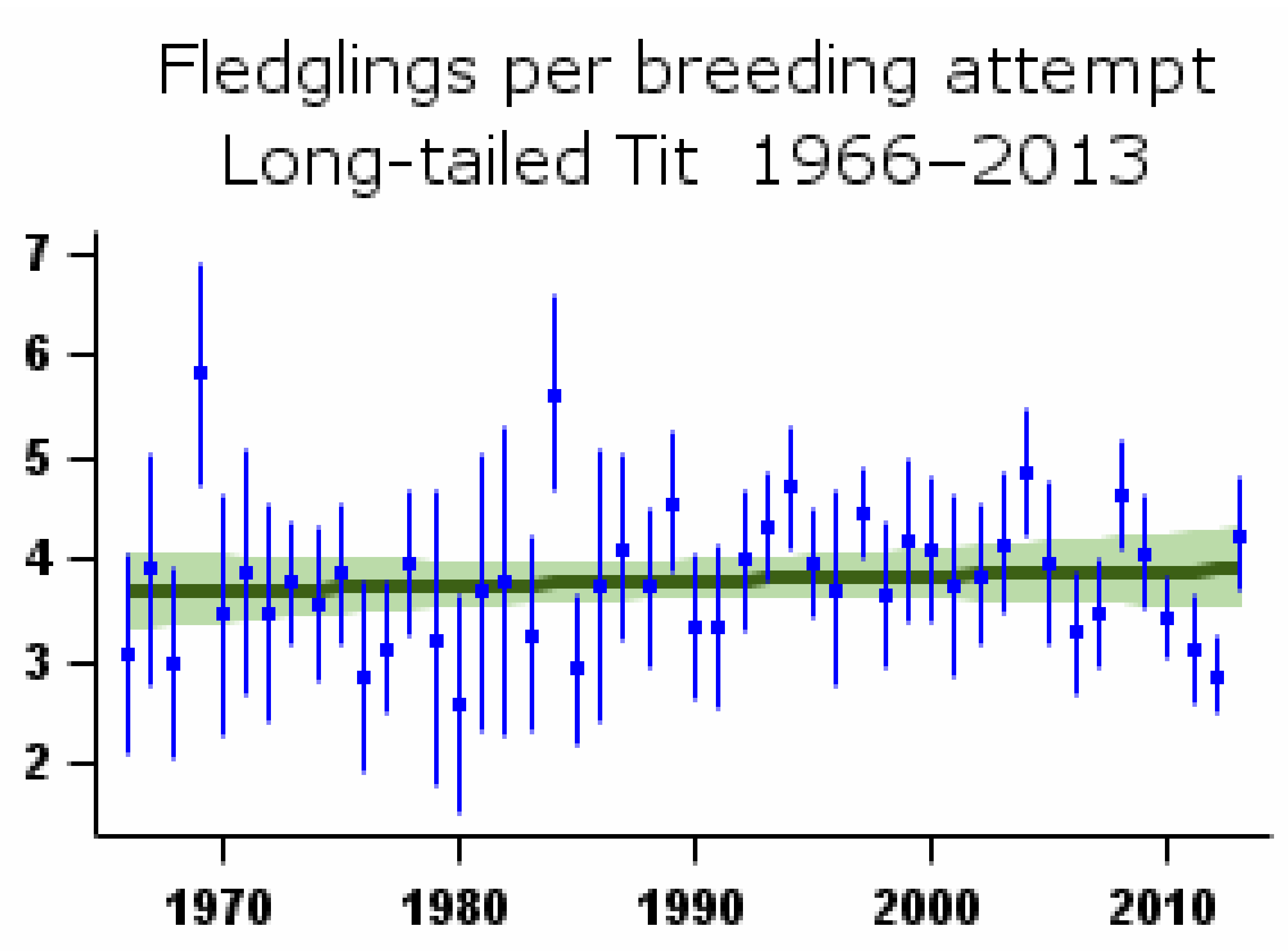


Habitat graph

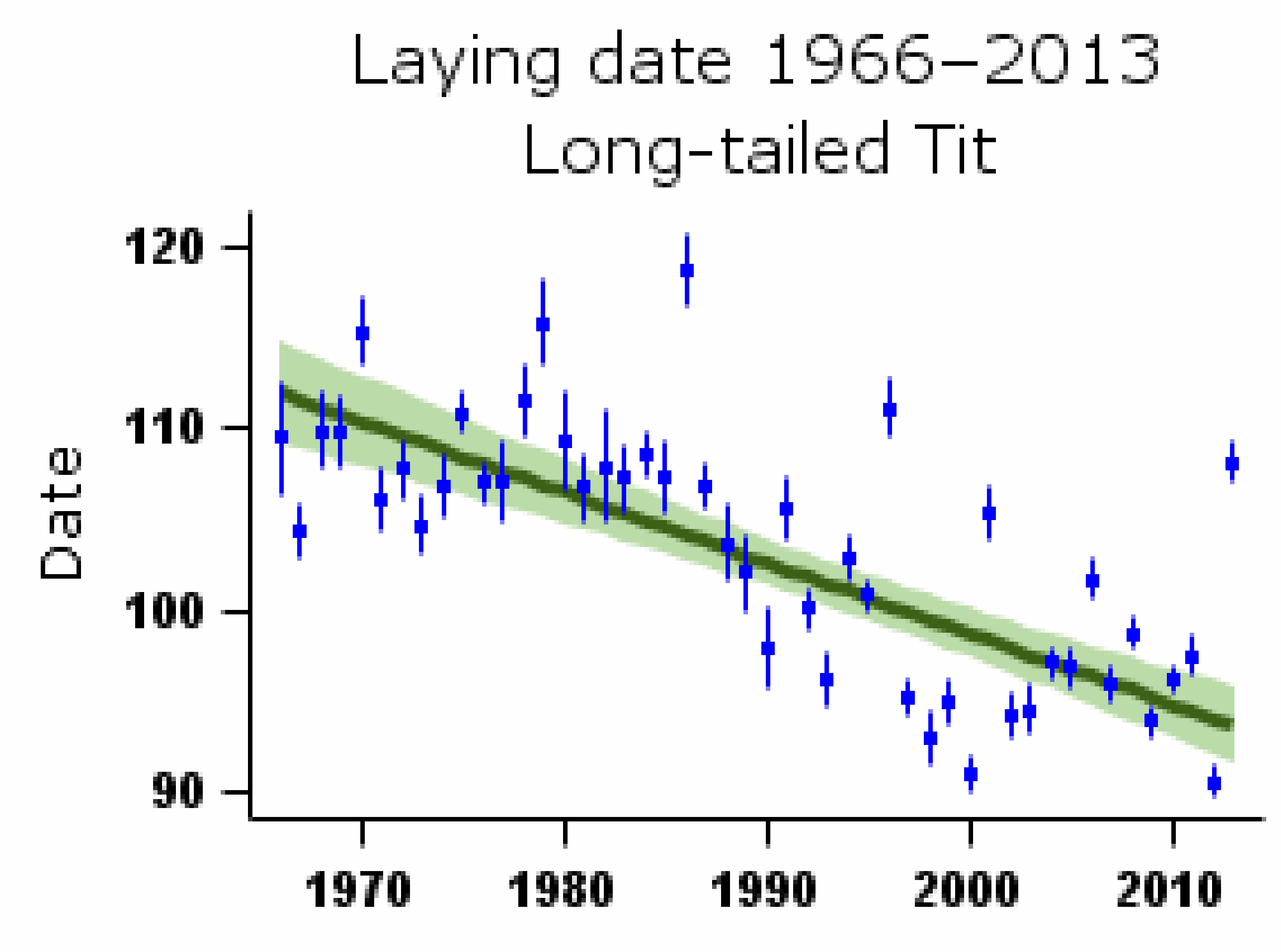


Habitat graph

Demographic trends



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

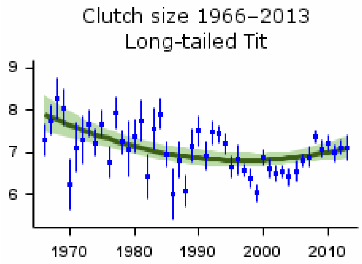


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

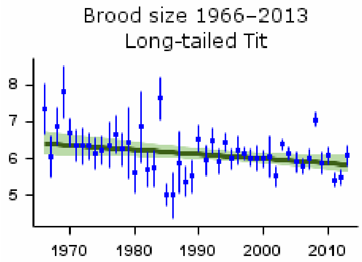
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	33	None					
Clutch size	44	1968-2012	42	Curvilinear	7.77 eggs	7.06 eggs	-9.1%		
Brood size	44	1968-2012	33	Linear decline	6.38 chicks	5.86 chicks	-8.2%		
Nest failure rate at egg stage	44	1968-2012	59	Curvilinear	3.62% nests/day	1.10% nests/day	-69.6%		
Nest failure rate at chick stage	44	1968-2012	40	Linear increase	0.72% nests/day	2.14% nests/day	197.2%		
Laying date	44	1968-2012	53	Linear decline	Apr 21	Apr 4	-17 days		
Juvenile to Adult ratio (CES)	28	1984-2012	88	Smoothed trend	148 Index value	100 Index value	-32%		
Juvenile to Adult ratio (CES)	25	1987-2012	95	Smoothed trend	92 Index value	100 Index value	9%		
Juvenile to Adult ratio (CES)	10	2002-2012	101	Smoothed trend	133 Index value	100 Index value	-25%		
Juvenile to Adult ratio (CES)	5	2007-2012	100	Smoothed trend	134 Index value	100 Index value	-25%	>25	

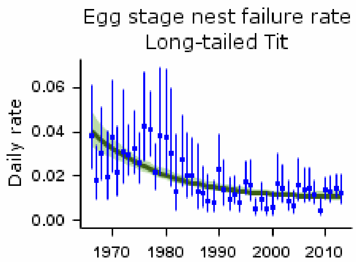
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



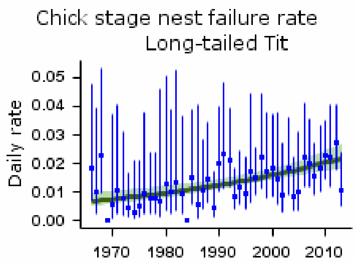
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



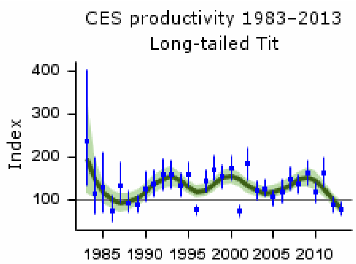
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



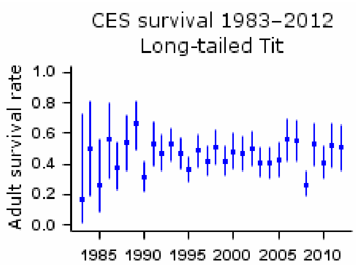
Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



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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Wood Warbler

Phylloscopus sibilatrix

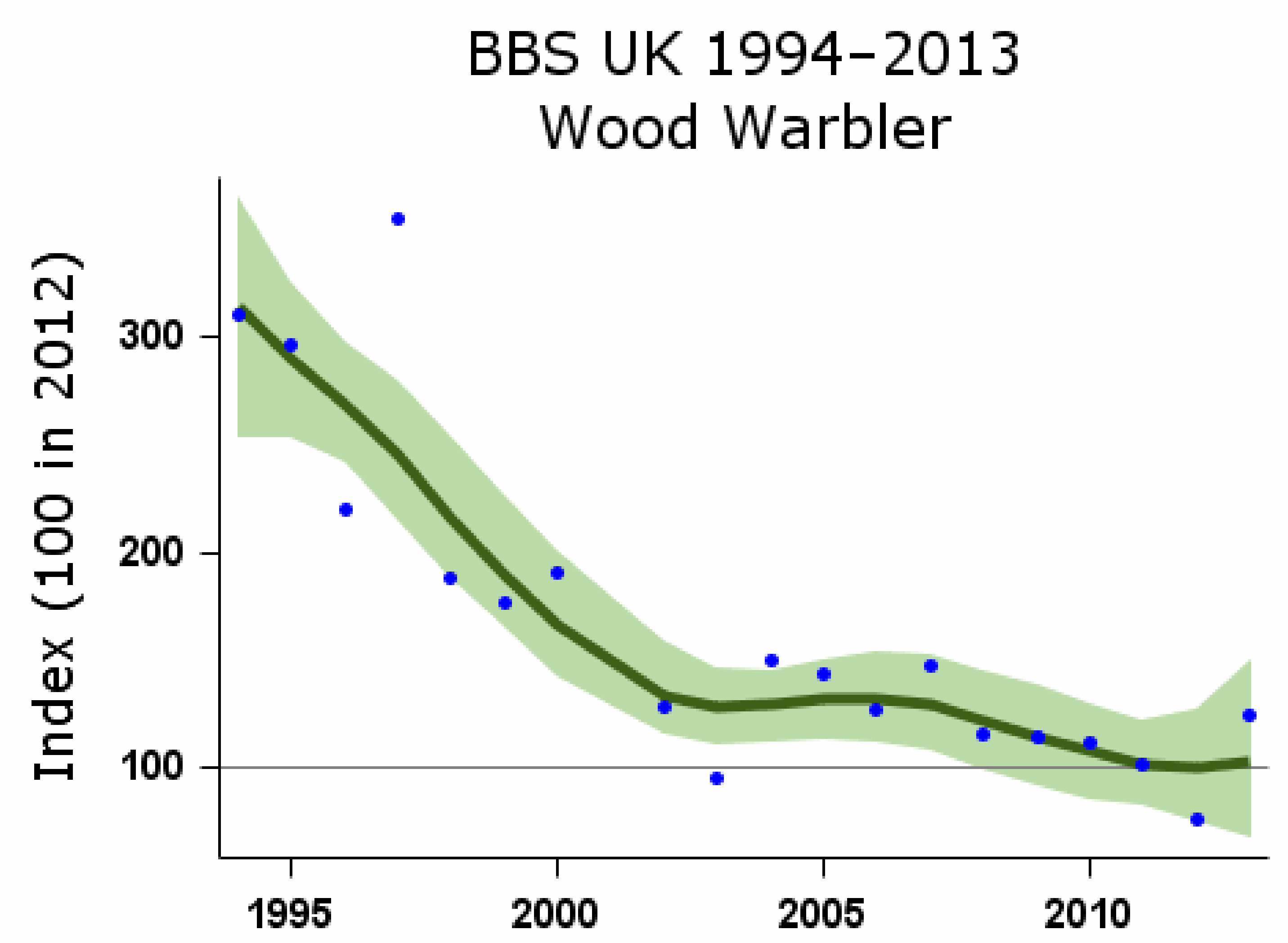
Key facts

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 first two atlas periods (Gibbonset al. 1993), but has subsequently withdrawn from large areas of lowland England (Balmer et al. 2013). 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 warranted a further shift to the red list in 2009. 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 decline across Europe since 1980 (PECBMS 2014a).



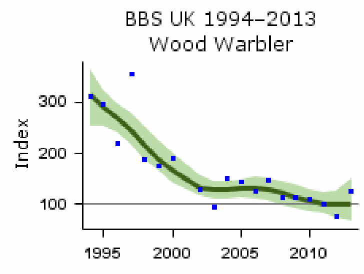
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	17	1995-2012	52	-66	-78	-49	>50	
	10	2002-2012	49	-25	-47	6		
	5	2007-2012	50	-22	-46	14		

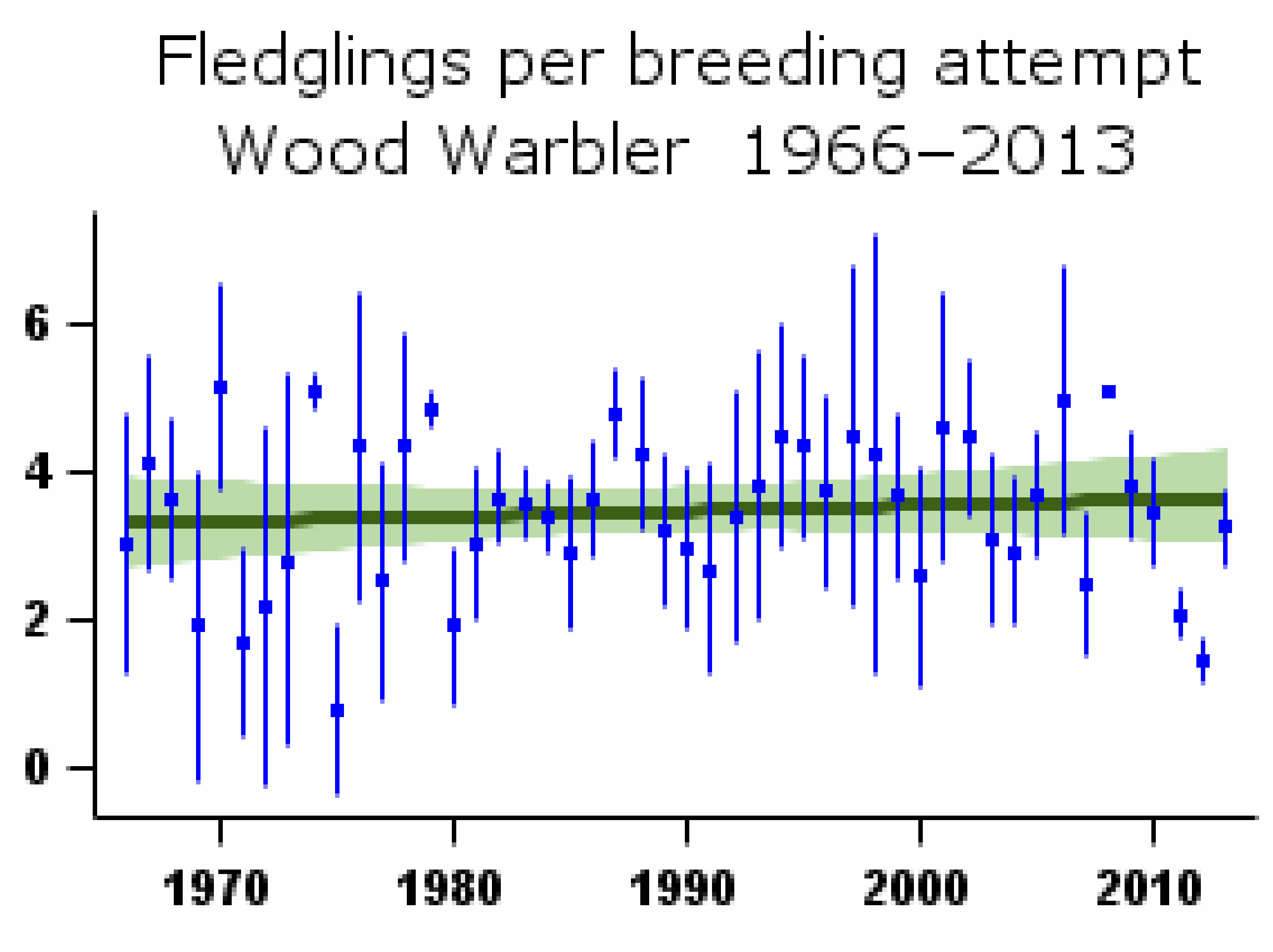
Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

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

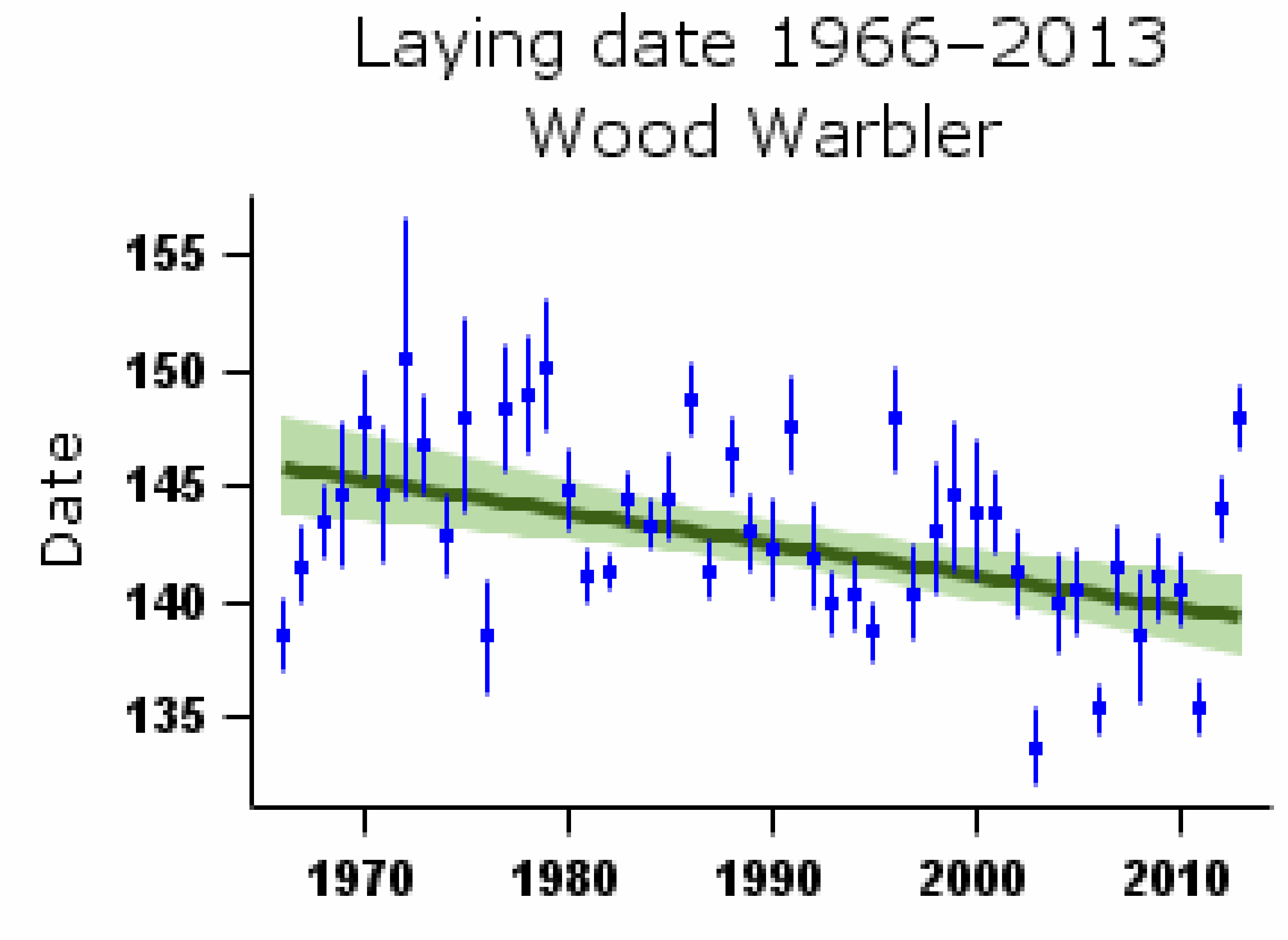


BBS UK graph

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

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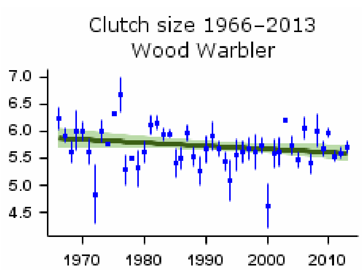
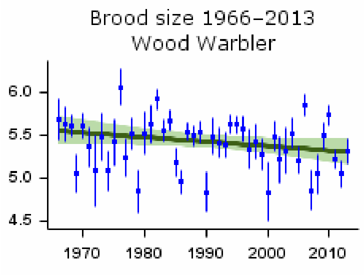
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	24	None					
Clutch size	44	1968-2012	20	None					Small sample
Brood size	44	1968-2012	39	None					
Nest failure rate at egg stage	44	1968-2012	25	Curvilinear	2.20% nests/day	1.25% nests/day	-43.2%		Small sample
Nest failure rate at chick stage	44	1968-2012	31	Curvilinear	2.61% nests/day	5.01% nests/day	92.0%		
Laying date	44	1968-2012	36	Linear decline	May 26	May 19	-7 days		

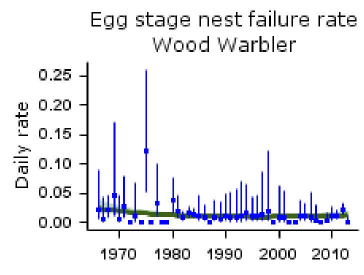
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



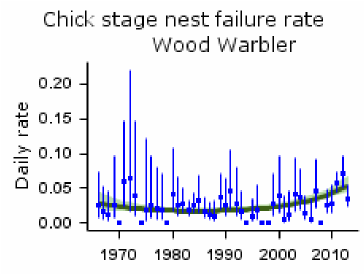
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



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 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 failures now seem more likely to occur at the chick stage, although nest record samples are small. There has been no trend in the number of fledglings per breeding attempt.

Bibby (1989) postulated that soils, climate, competition or predator numbers have probably had an effect on Wood Warbler numbers but provided no evidence in support. 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, where an average of over 70% of nests were lost and predators were responsible for over 80% of the losses, have reported that varying predation rates were a main factor responsible for variation in production between years and habitats (Wesolowski 1985). 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.

Mismatch between timing of breeding and the seasonal peaks of caterpillar abundance is potentially not a serious problem for Wood Warblers, because of their ability to feed their young successfully on flying insects and spiders (Mallord et al. in prep: Hayhowet al. 2014).

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Chiffchaff

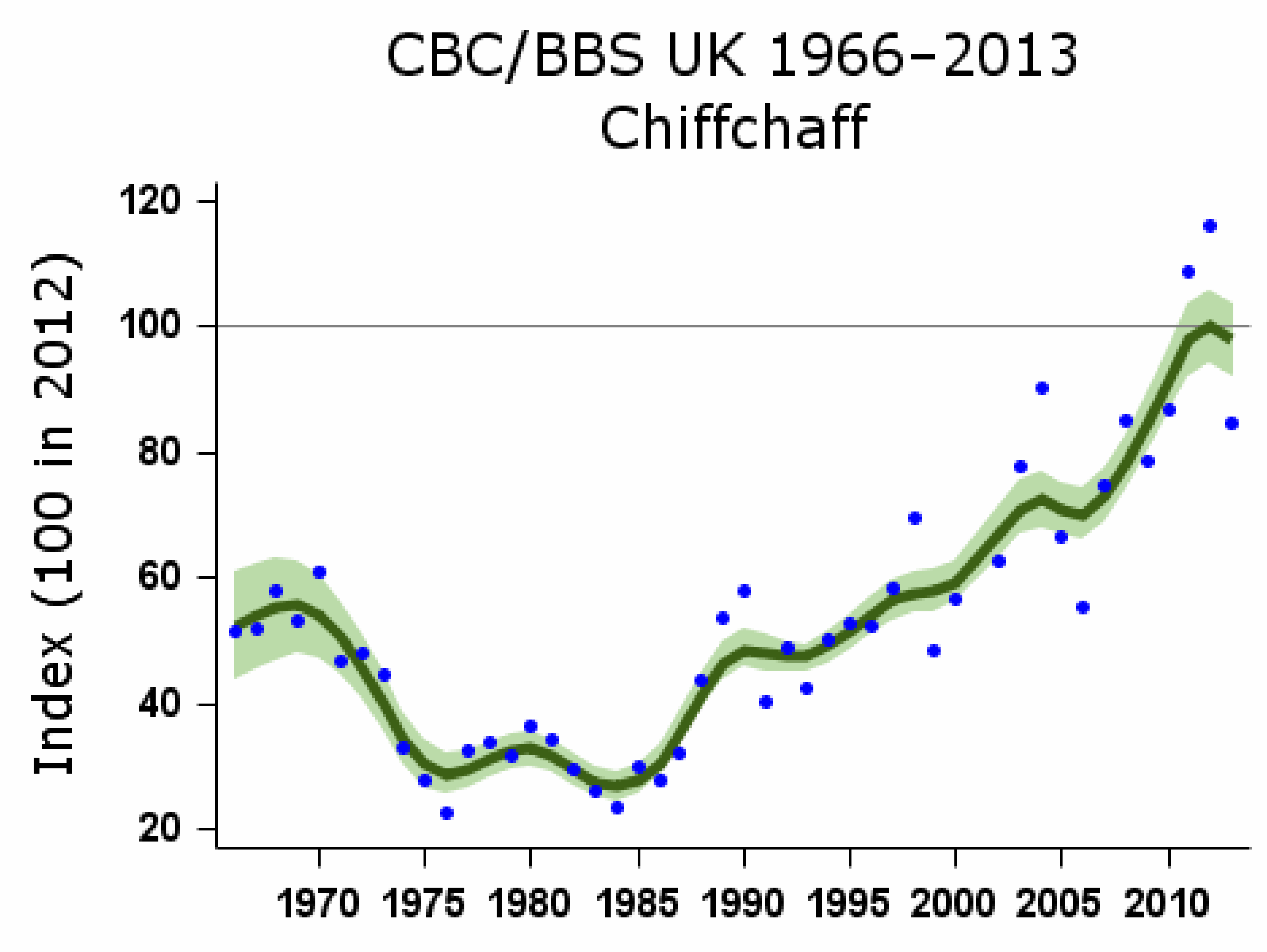
Phylloscopus collybita

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 declined 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 2014a).



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

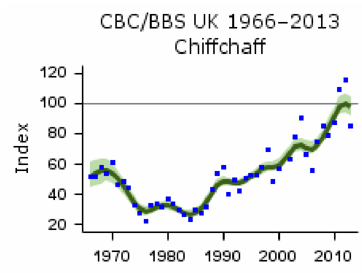
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	45	1967-2012	682	85	49	133		
	25	1987-2012	1132	185	147	211		
	10	2002-2012	1793	49	43	54		
	5	2007-2012	2091	37	33	41		
CBC/BBS England	45	1967-2012	581	88	55	145		
	25	1987-2012	960	183	138	213		

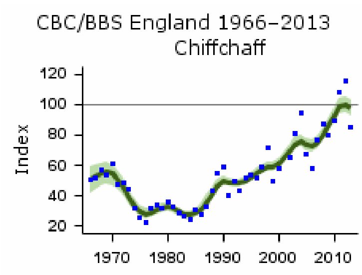
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	10	2002-2012	1509	44	37	48		
	5	2007-2012	1767	34	30	37		
CES adults	28	1984-2012	74	245	121	479		
	25	1987-2012	80	153	81	305		
	10	2002-2012	92	28	15	50		
	5	2007-2012	93	44	33	60		
CES juveniles	28	1984-2012	85	181	94	378		
	25	1987-2012	91	95	37	218		
	10	2002-2012	99	16	-5	39		
	5	2007-2012	101	46	29	67		
BBS UK	17	1995-2012	1506	88	81	100		
	10	2002-2012	1793	51	44	56		
	5	2007-2012	2091	36	33	39		
BBS England	17	1995-2012	1271	86	78	97		
	10	2002-2012	1509	44	38	48		
	5	2007-2012	1767	32	29	35		
BBS Scotland	17	1995-2012	50	457	267	773		
	10	2002-2012	66	120	67	198		
	5	2007-2012	88	71	43	99		
BBS Wales	17	1995-2012	140	59	34	86		
	10	2002-2012	164	48	29	69		
	5	2007-2012	170	38	24	54		
BBS N.Ireland	17	1995-2012	35	21	-6	54		
	10	2002-2012	42	54	20	123		
	5	2007-2012	53	31	14	55		

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

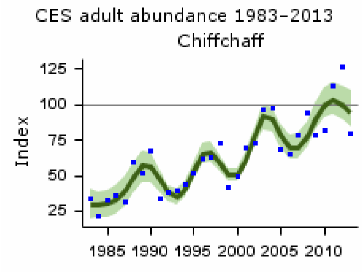
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



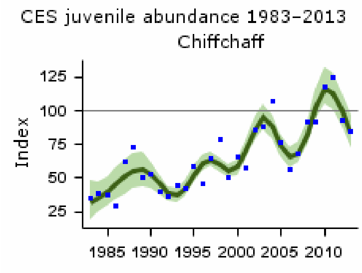
CBC/BBS UK graph



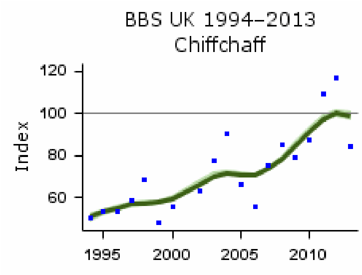
CBC/BBS England graph



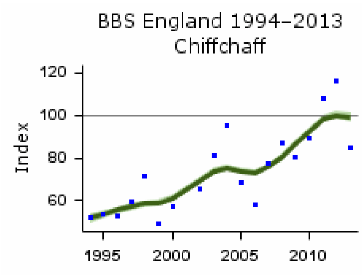
CES adults graph



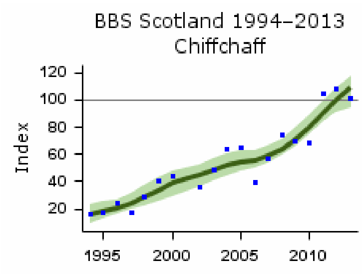
CES juveniles graph



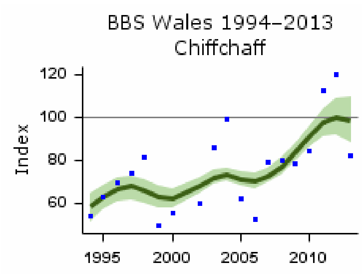
BBS UK graph



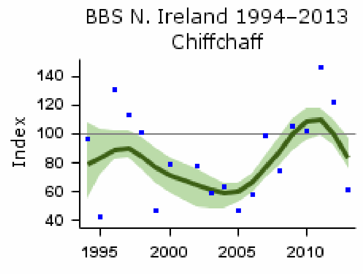
BBS England graph



BBS Scotland graph

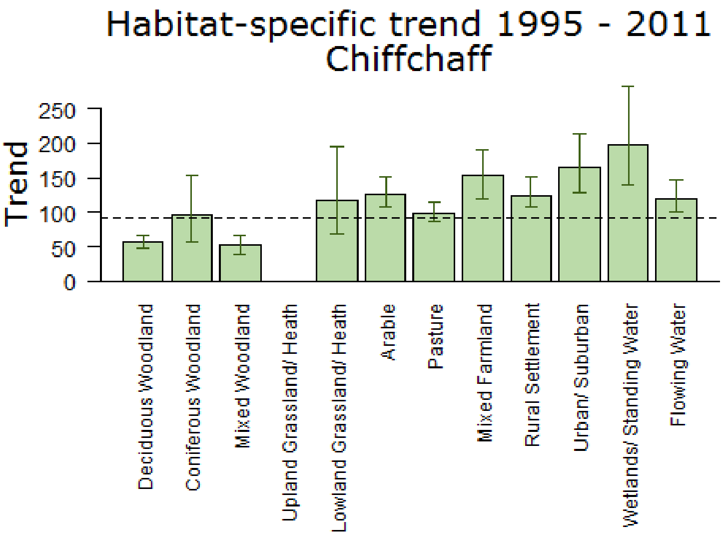


BBS Wales graph



BBS N.Ireland graph

Population trends by habitat



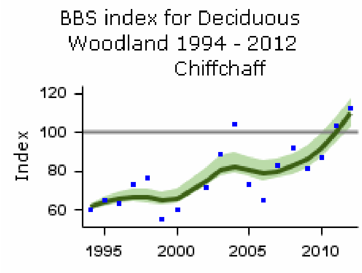
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

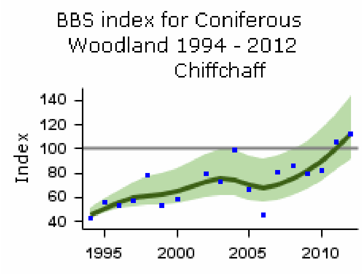
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	601	56	47	67
Coniferous Woodland	16	1995-2011	106	96	56	154
Mixed Woodland	16	1995-2011	319	53	38	67
Lowland Grassland/ Heath	16	1995-2011	77	117	67	196
Arable	16	1995-2011	372	127	107	151
Pasture	16	1995-2011	691	99	88	114
Mixed Farmland	16	1995-2011	296	154	120	190
Rural Settlement	16	1995-2011	401	125	107	152
Urban/ Suburban	16	1995-2011	178	166	129	214
Wetlands/ Standing Water	16	1995-2011	56	198	141	283
Flowing Water	16	1995-2011	265	120	101	148

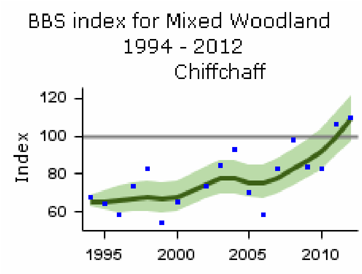
Further information on habitat-specific trends, please follow link here.



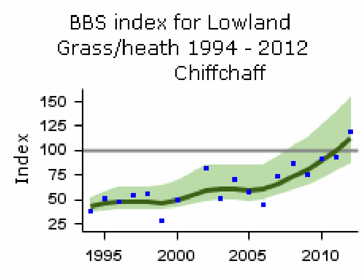
Habitat graph



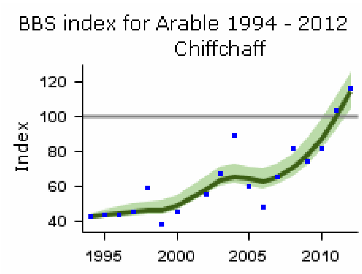
Habitat graph



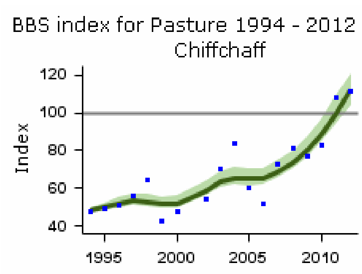
Habitat graph



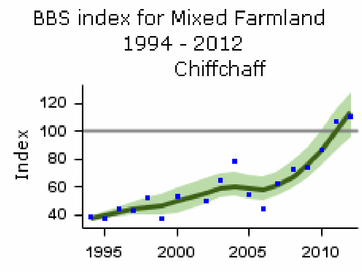
Habitat graph



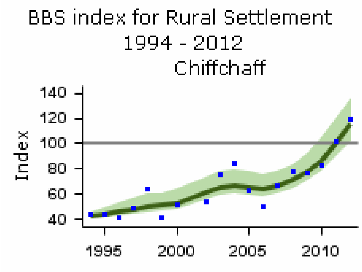
Habitat graph



Habitat graph



Habitat graph



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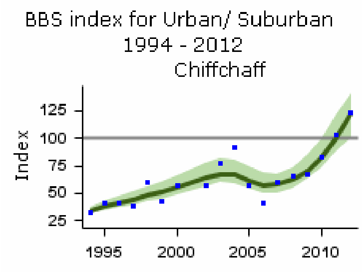

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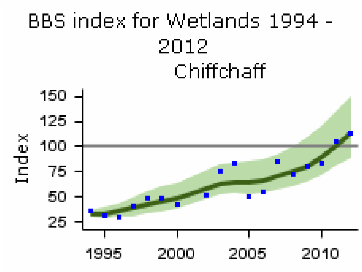
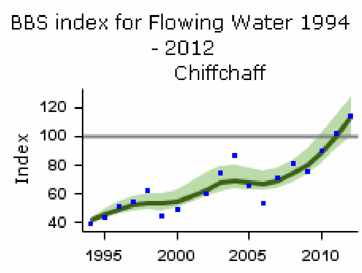
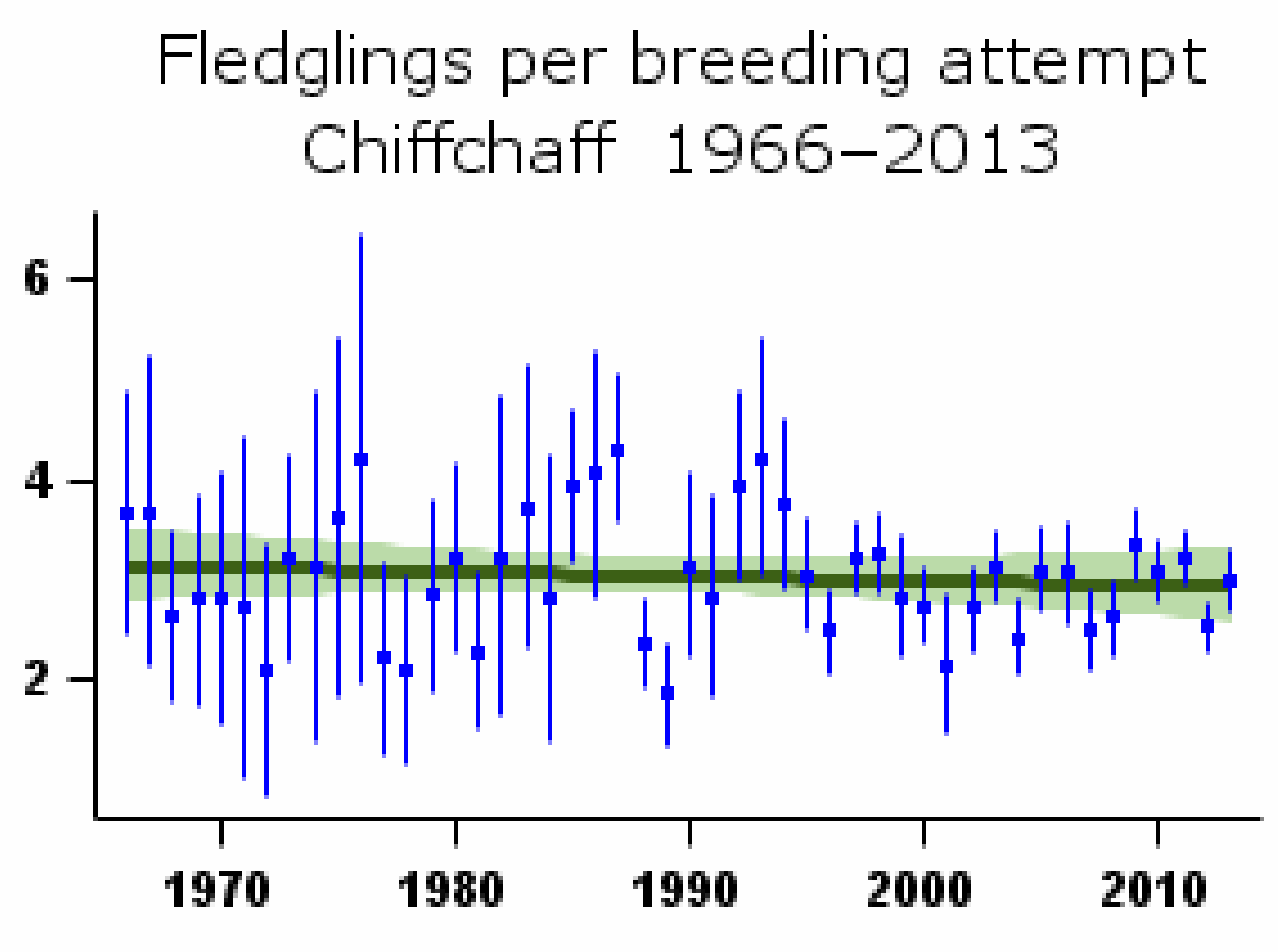


Habitat graph

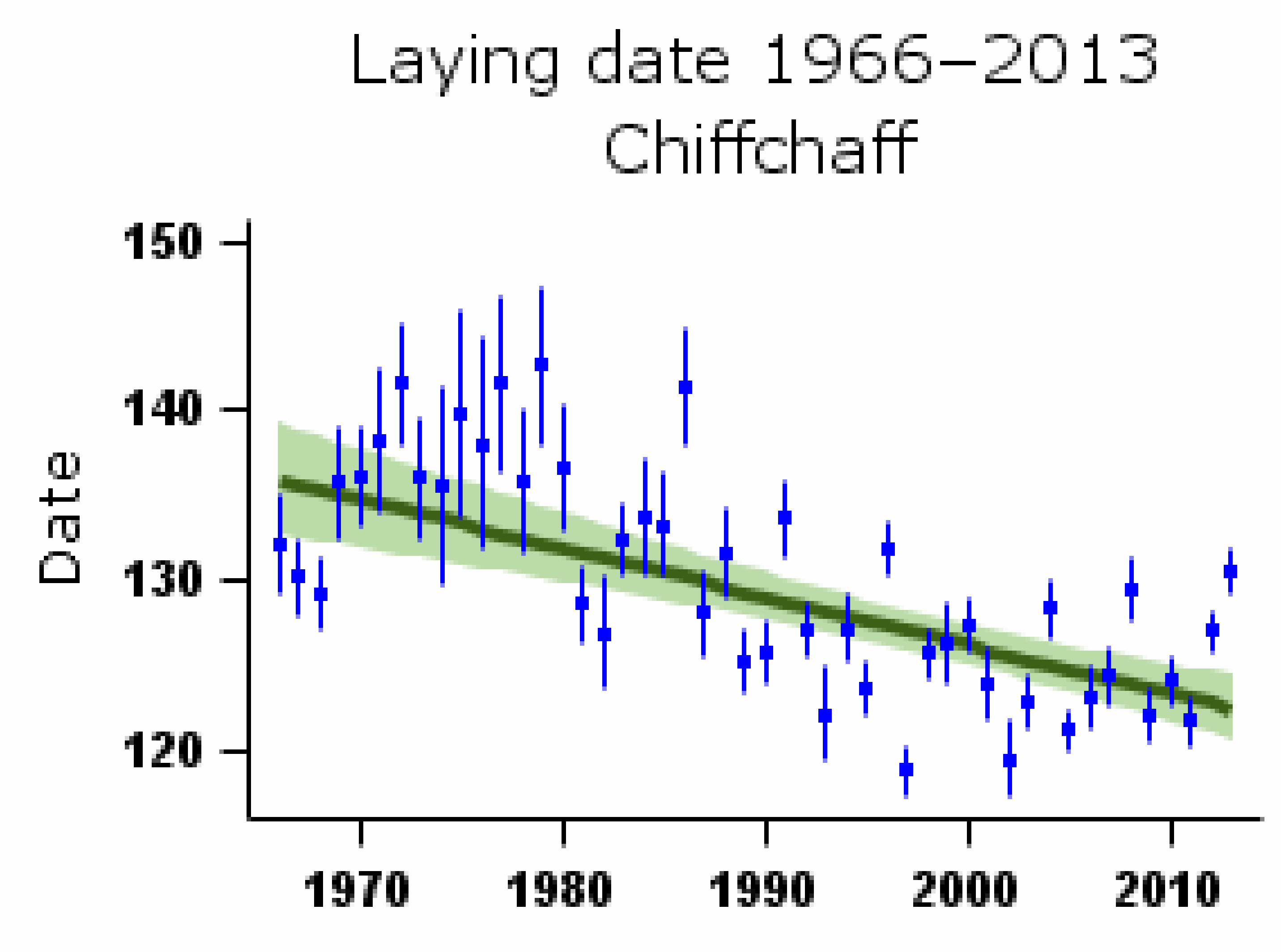


Habitat graph

Demographic trends



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

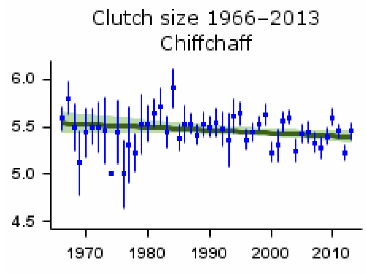


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

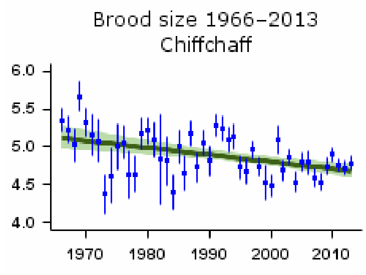
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	41	None					
Clutch size	44	1968-2012	40	None					
Brood size	44	1968-2012	45	Linear decline	5.10 chicks	4.69 chicks	-8.0%		
Nest failure rate at egg stage	44	1968-2012	51	None					
Nest failure rate at chick stage	44	1968-2012	45	None					
Laying date	44	1968-2012	59	Linear decline	May 15	May 3	-12 days		
Juvenile to Adult ratio (CES)	28	1984-2012	91	Smoothed trend	119 Index value	100 Index value	-16%		
Juvenile to Adult ratio (CES)	25	1987-2012	98	Smoothed trend	151 Index value	100 Index value	-34%	>25	
Juvenile to Adult ratio (CES)	10	2002-2012	104	Smoothed trend	125 Index value	100 Index value	-20%		
Juvenile to Adult ratio (CES)	5	2007-2012	105	Smoothed trend	99 Index value	100 Index value	1%		

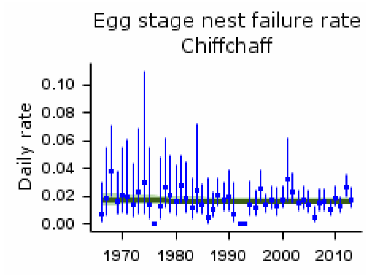
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



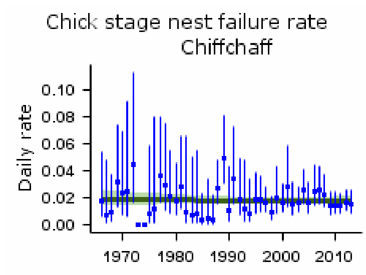
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



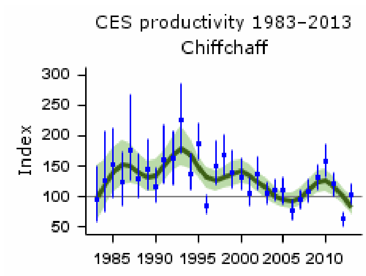
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



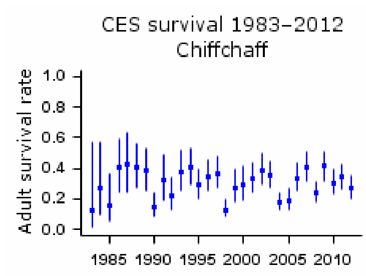
Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Willow Warbler

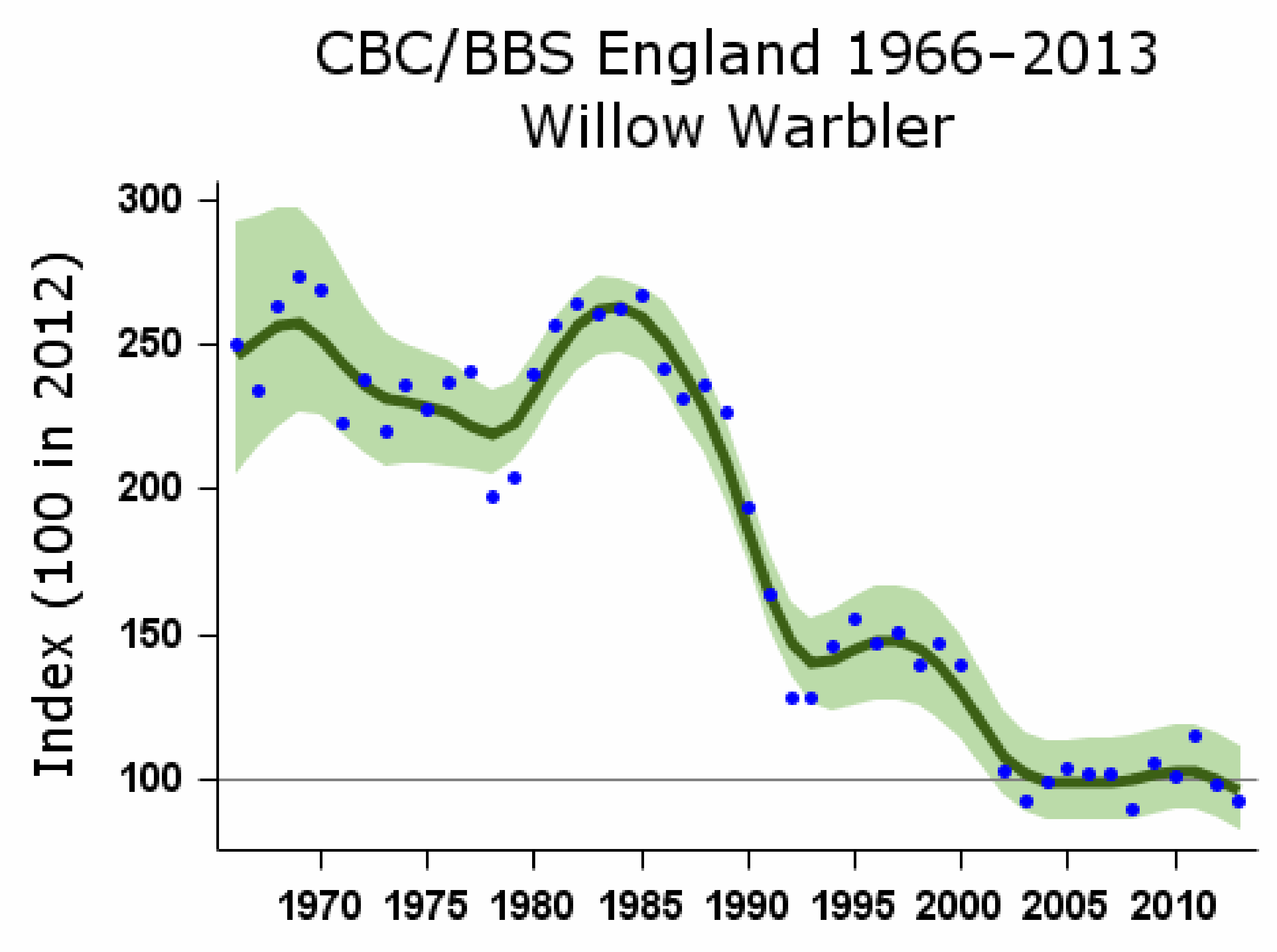
Phylloscopus trochilus

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, 2013a, Massimino et al. 2013, Balmer et al. 2013). 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 upward trend in Scotland and in Northern Ireland, and continued severe decreases in England, with no overall trend in Wales. The BBS Fuller et al. 2005). It is among a suite of species that winter in the humid zone of West Africa and correspondingly are showing the strongest population declines among our migrant species (Ockendon et al. 2012, 2014). The recent population decline is associated with a shallow decline in productivity as measured by CES and with a substantial increase in nest failure rates, 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 shifted earlier by more than a week, perhaps in response to recent climatic warming (Crick & Sparks 1999). Numbers have shown a widespread moderate decline across Europe since 1980 (PECBMS 2014a, Lehikoinen et al. 2014).



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

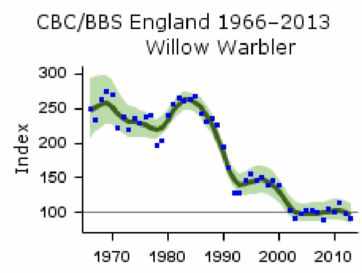
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	45	1967-2012	492	-60	-72	-45	>50	

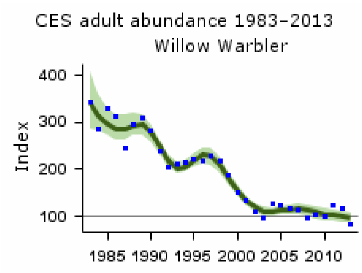
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	25	1987-2012	752	-58	-66	-52	>50	
	10	2002-2012	968	-7	-13	-3		
	5	2007-2012	1083	1	-3	6		
CES adults	28	1984-2012	89	-68	-75	-61	>50	
	25	1987-2012	95	-65	-72	-58	>50	
	10	2002-2012	87	-17	-27	-4		
	5	2007-2012	88	-14	-20	-7		
CES juveniles	28	1984-2012	93	-40	-59	-12	>25	
	25	1987-2012	99	-44	-61	-22	>25	
	10	2002-2012	96	1	-21	23		
	5	2007-2012	97	10	-11	31		
BBS UK	17	1995-2012	1405	0	-6	7		
	10	2002-2012	1470	14	6	20		
	5	2007-2012	1633	12	7	17		
BBS England	17	1995-2012	945	-34	-38	-29	>25	
	10	2002-2012	968	-8	-14	-3		
	5	2007-2012	1083	1	-3	5		
BBS Scotland	17	1995-2012	215	29	14	42		
	10	2002-2012	231	16	4	30		
	5	2007-2012	273	11	4	20		
BBS Wales	17	1995-2012	161	-7	-20	12		
	10	2002-2012	173	27	13	44		
	5	2007-2012	174	19	6	32		
BBS N.Ireland	17	1995-2012	81	92	42	126		
	10	2002-2012	94	39	23	63		
	5	2007-2012	100	26	14	39		

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

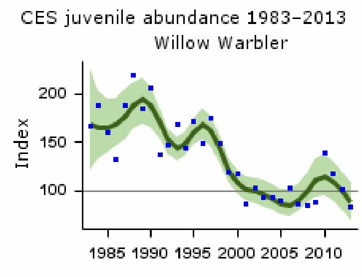
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



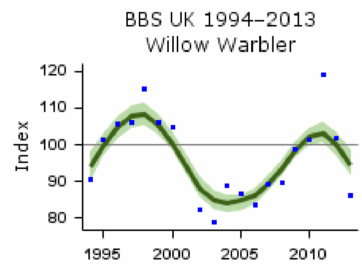
CBC/BBS England graph



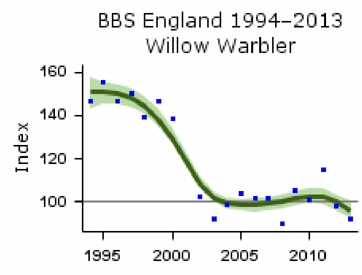
CES adults graph



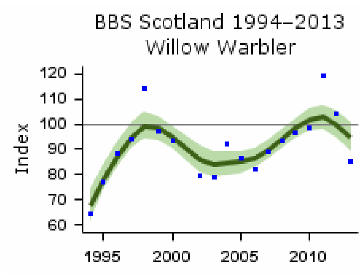
CES juveniles graph



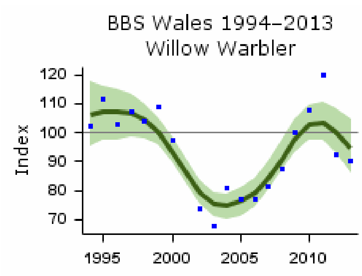
BBS UK graph



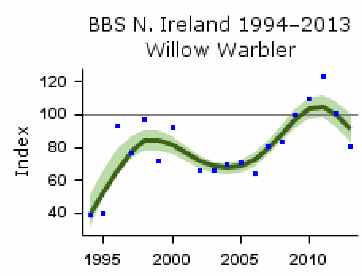
BBS England graph



BBS Scotland graph

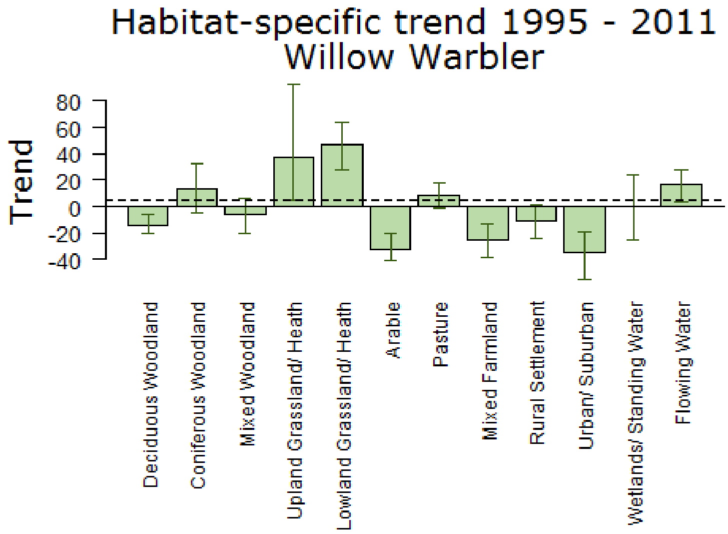


BBS Wales graph



BBS N.Ireland graph

Population trends by habitat



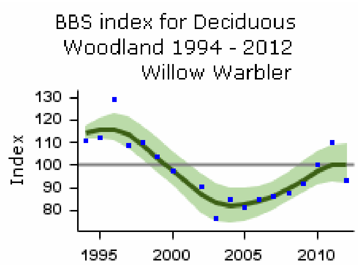
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

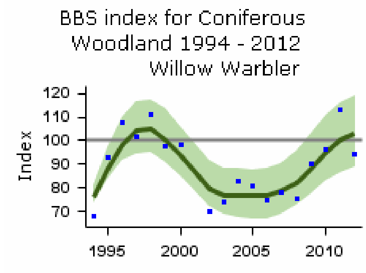
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	448	-14	-20	-6
Coniferous Woodland	16	1995-2011	185	13	-4	33
Mixed Woodland	16	1995-2011	260	-5	-20	6
Upland Grassland/ Heath	16	1995-2011	57	38	5	92
Lowland Grassland/ Heath	16	1995-2011	166	46	28	63
Arable	16	1995-2011	254	-32	-41	-20
Pasture	16	1995-2011	651	8	-1	18
Mixed Farmland	16	1995-2011	206	-25	-39	-14
Rural Settlement	16	1995-2011	294	-11	-23	1
Urban/ Suburban	16	1995-2011	110	-35	-55	-19
Wetlands/ Standing Water	16	1995-2011	61	1	-26	24
Flowing Water	16	1995-2011	273	17	4	27

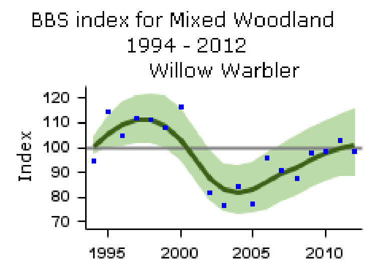
Further information on habitat-specific trends, please follow link here.



Habitat graph



Habitat graph



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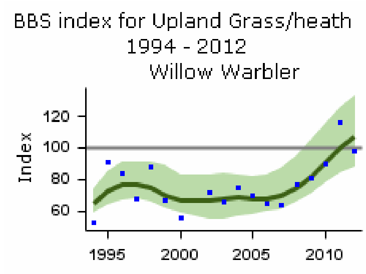

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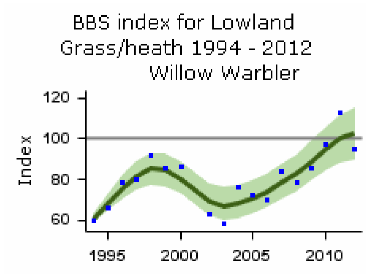
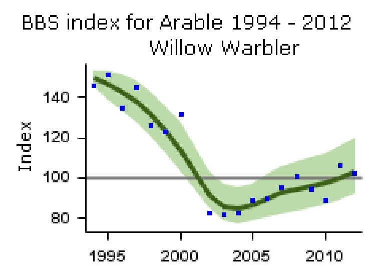
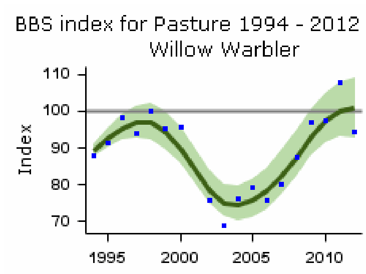


Habitat graph



Habitat graph



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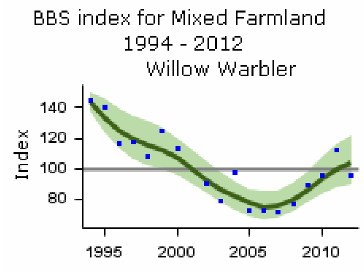
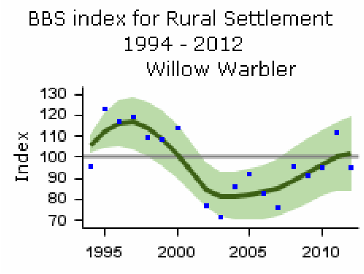


Habitat graph



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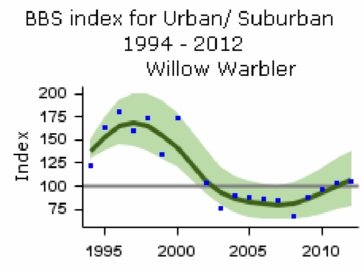
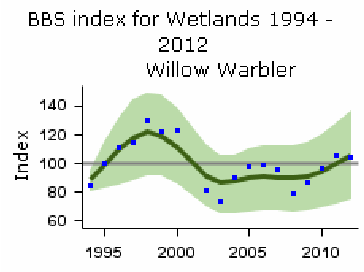


Habitat graph



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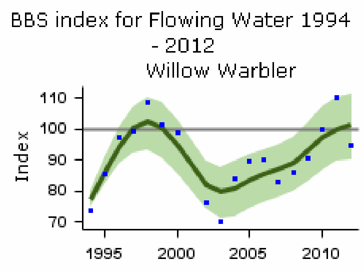
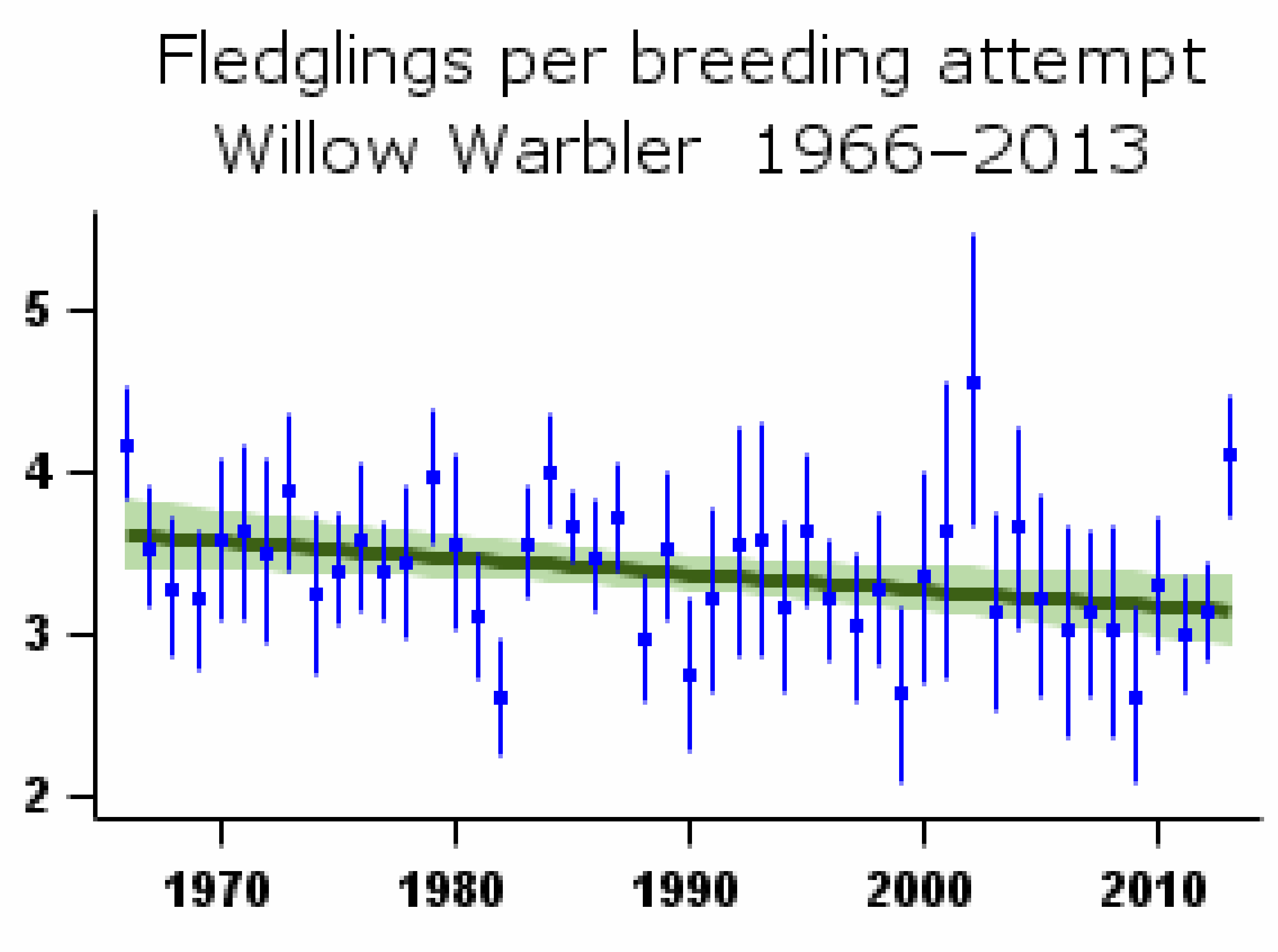
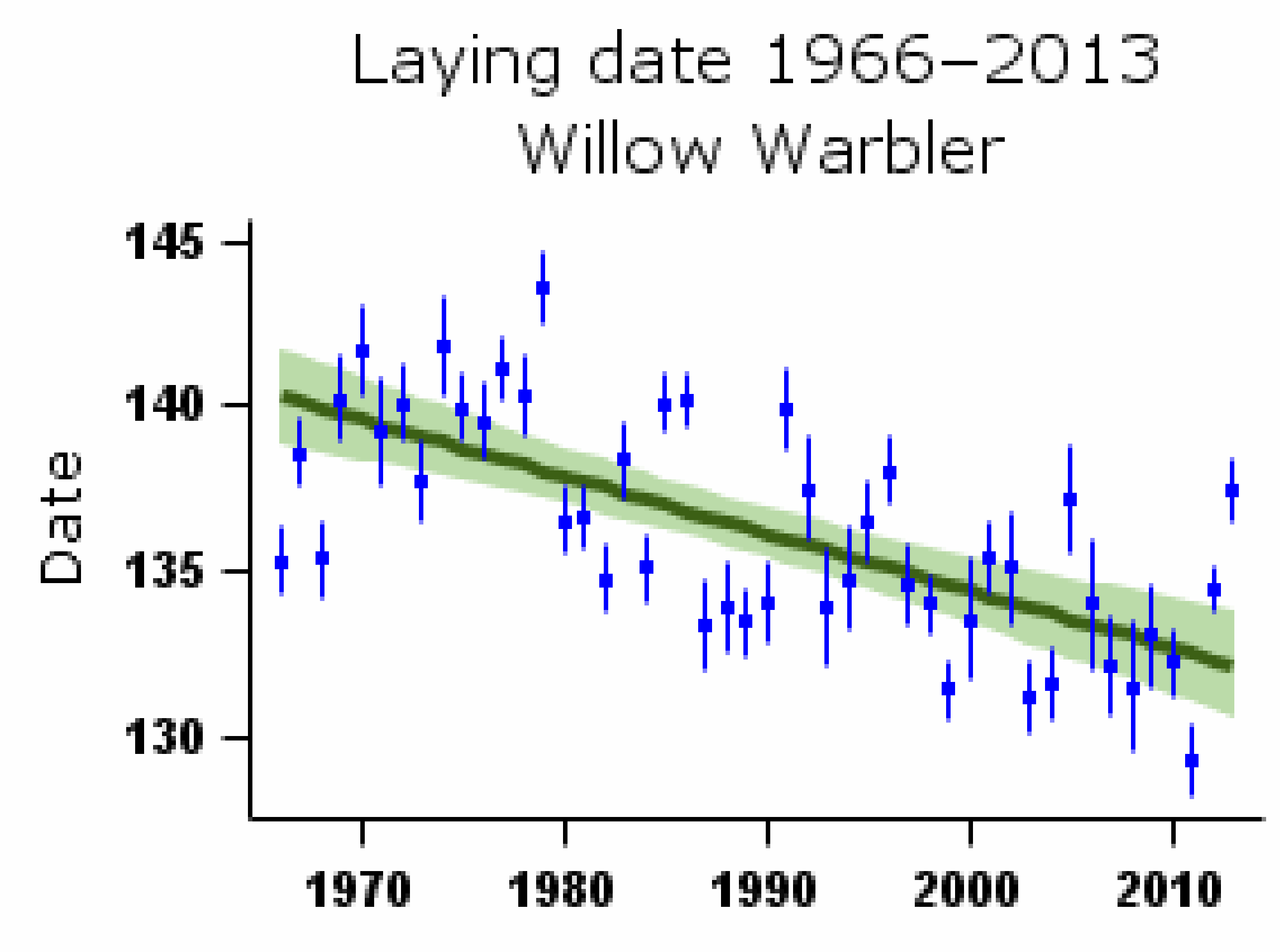


Habitat graph

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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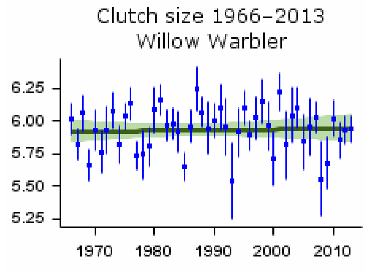
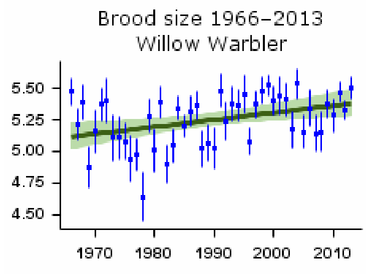
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	69	Linear decline	3.59 fledglings	3.15 fledglings	-12.3%		
Clutch size	44	1968-2012	50	None					
Brood size	44	1968-2012	150	Linear increase	5.13 chicks	5.38 chicks	4.8%		
Nest failure rate at egg stage	44	1968-2012	69	Linear increase	0.94% nests/day	1.75% nests/day	86.2%		
Nest failure rate at chick stage	44	1968-2012	129	Linear increase	1.54% nests/day	2.05% nests/day	33.1%		
Laying date	44	1968-2012	90	Linear decline	May 20	May 12	-8 days		
Juvenile to Adult ratio (CES)	28	1984-2012	99	Smoothed trend	141 Index value	100 Index value	-29%	>25	
Juvenile to Adult ratio (CES)	25	1987-2012	105	Smoothed trend	126 Index value	100 Index value	-21%		
Juvenile to Adult ratio (CES)	10	2002-2012	102	Smoothed trend	105 Index value	100 Index value	-5%		
Juvenile to Adult ratio (CES)	5	2007-2012	103	Smoothed trend	96 Index value	100 Index value	4%		

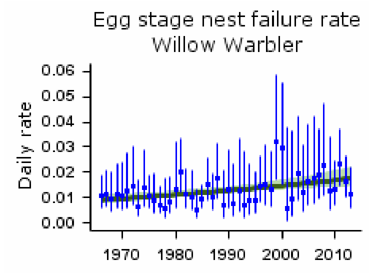
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



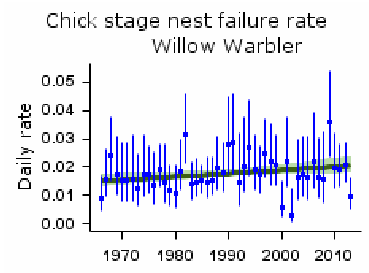
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



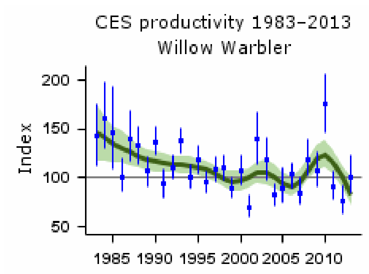
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



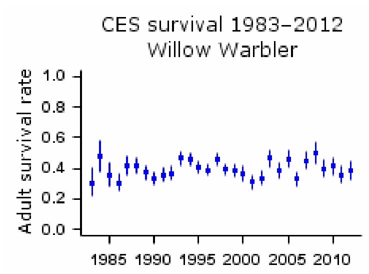
Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Blackcap

Sylvia atricapilla

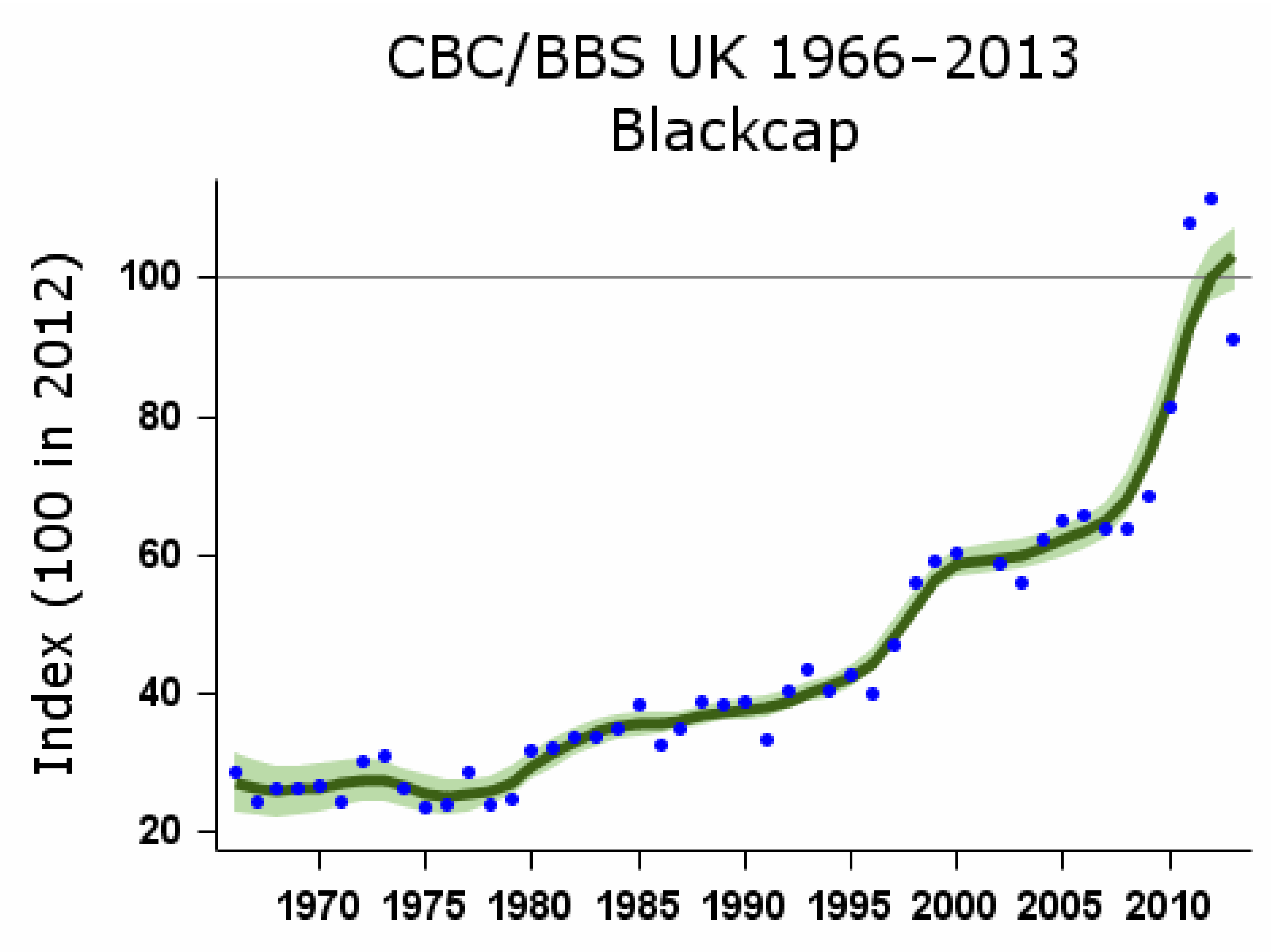
Key facts

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. An acceleration of the upward trend over the last five years has been extraordinary. Overall increase has occurred despite a reduction in habitat quality for Blackcap, and other species dependent on the understorey, brought about by deer browsing in young woodland (Holt et al. 2012d). The BBS Balmer et al. 2013), is indicated by the BBS trend. Numbers have shown widespread moderate increase across Europe since 1980 (PECBMS 2014a).



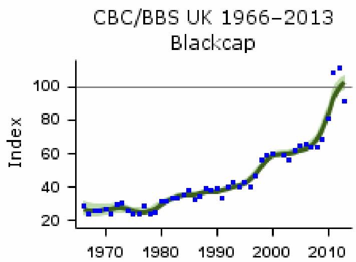
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

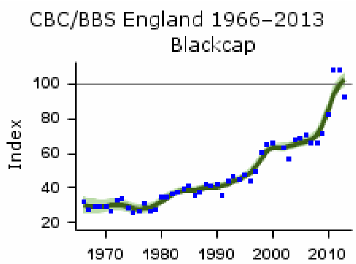
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	45	1967-2012	736	280	219	370		
	25	1987-2012	1210	177	158	199		
	10	2002-2012	1871	68	62	76		
	5	2007-2012	2145	54	51	59		
CBC/BBS England	45	1967-2012	637	242	180	329		
	25	1987-2012	1042	154	138	171		
	10	2002-2012	1590	57	53	62		
	5	2007-2012	1820	47	43	53		
CES adults	28	1984-2012	91	110	75	162		
	25	1987-2012	98	113	85	148		
	10	2002-2012	102	43	32	55		
	5	2007-2012	102	25	14	38		
CES juveniles	28	1984-2012	93	11	-22	53		
	25	1987-2012	99	42	11	86		
	10	2002-2012	104	1	-14	18		
	5	2007-2012	103	-3	-15	10		
BBS UK	17	1995-2012	1597	137	126	154		
	10	2002-2012	1871	68	64	76		
	5	2007-2012	2145	53	50	59		
BBS England	17	1995-2012	1369	113	102	124		
	10	2002-2012	1590	57	53	62		
	5	2007-2012	1820	46	42	50		
BBS Scotland	17	1995-2012	60	372	237	599		
	10	2002-2012	77	112	74	179		
	5	2007-2012	104	68	48	100		
BBS Wales	17	1995-2012	124	124	92	190		
	10	2002-2012	144	61	47	88		
	5	2007-2012	151	47	32	71		
BBS N.Ireland	17	1995-2012	38	2572352				
	10	2002-2012	49	133				
	5	2007-2012	59	149				

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

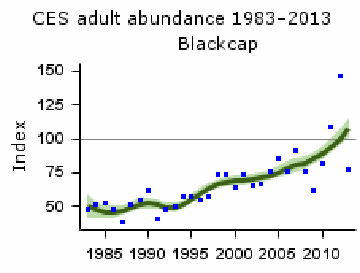
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



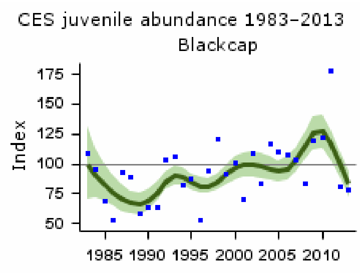
CBC/BBS UK graph



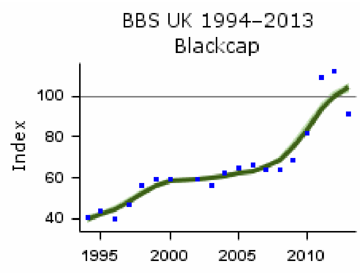
CBC/BBS England graph



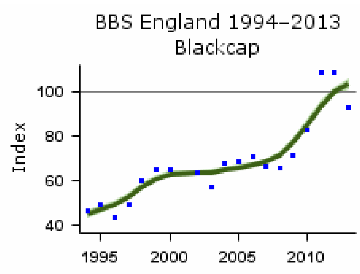
CES adults graph



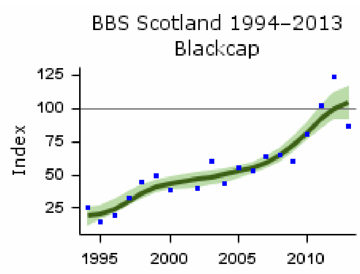
CES juveniles graph



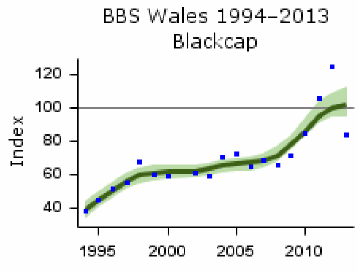
BBS UK graph



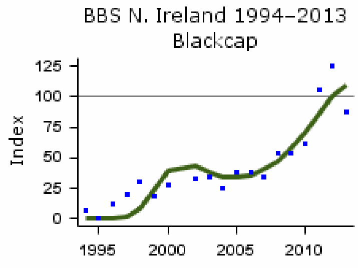
BBS England graph



BBS Scotland graph

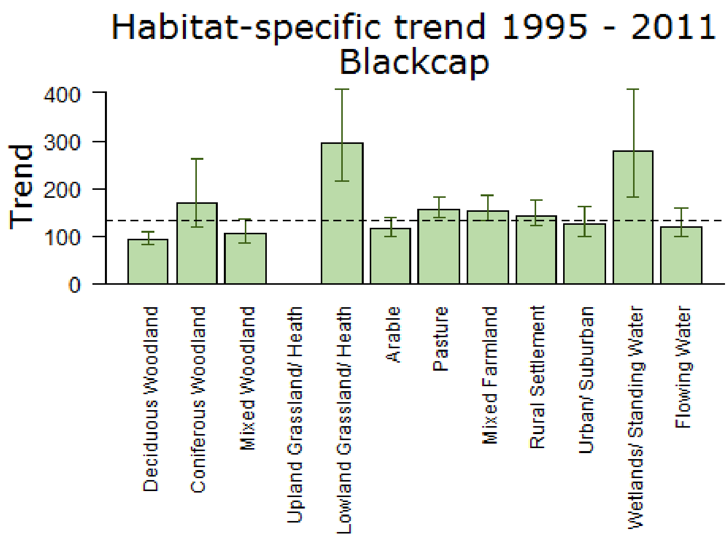


BBS Wales graph



BBS N.Ireland graph

Population trends by habitat



Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

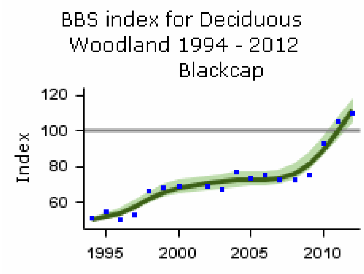
Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

More on habitat trends

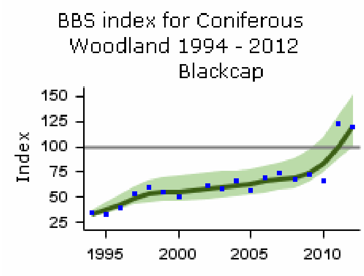
Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	631	92	82	108
Coniferous Woodland	16	1995-2011	94	169	117	263
Mixed Woodland	16	1995-2011	326	106	85	136
Lowland Grassland/ Heath	16	1995-2011	76	295	214	407
Arable	16	1995-2011	441	116	100	139
Pasture	16	1995-2011	709	154	140	181
Mixed Farmland	16	1995-2011	324	152	133	184
Rural Settlement	16	1995-2011	416	143	122	175
Urban/ Suburban	16	1995-2011	201	126	100	163
Wetlands/ Standing Water	16	1995-2011	56	280	182	408

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Flowing Water	16	1995-2011	281	120	99	158

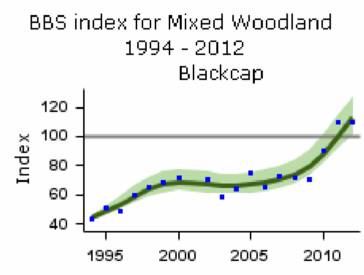
Further information on habitat-specific trends, please follow link here.



Habitat graph



Habitat graph



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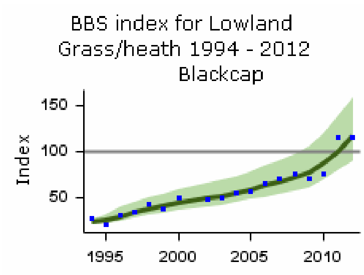
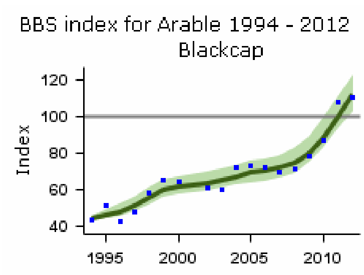


Habitat graph



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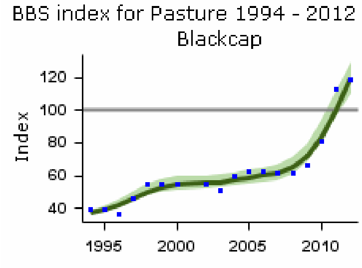

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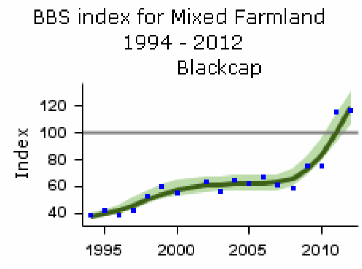

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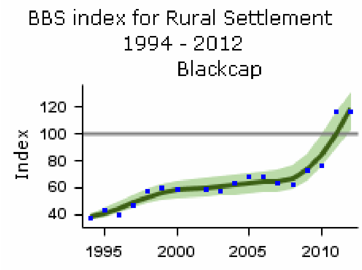

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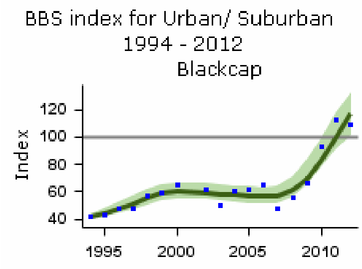

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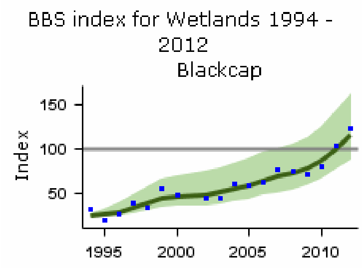

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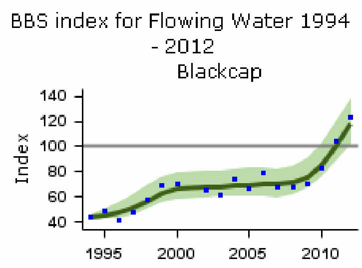
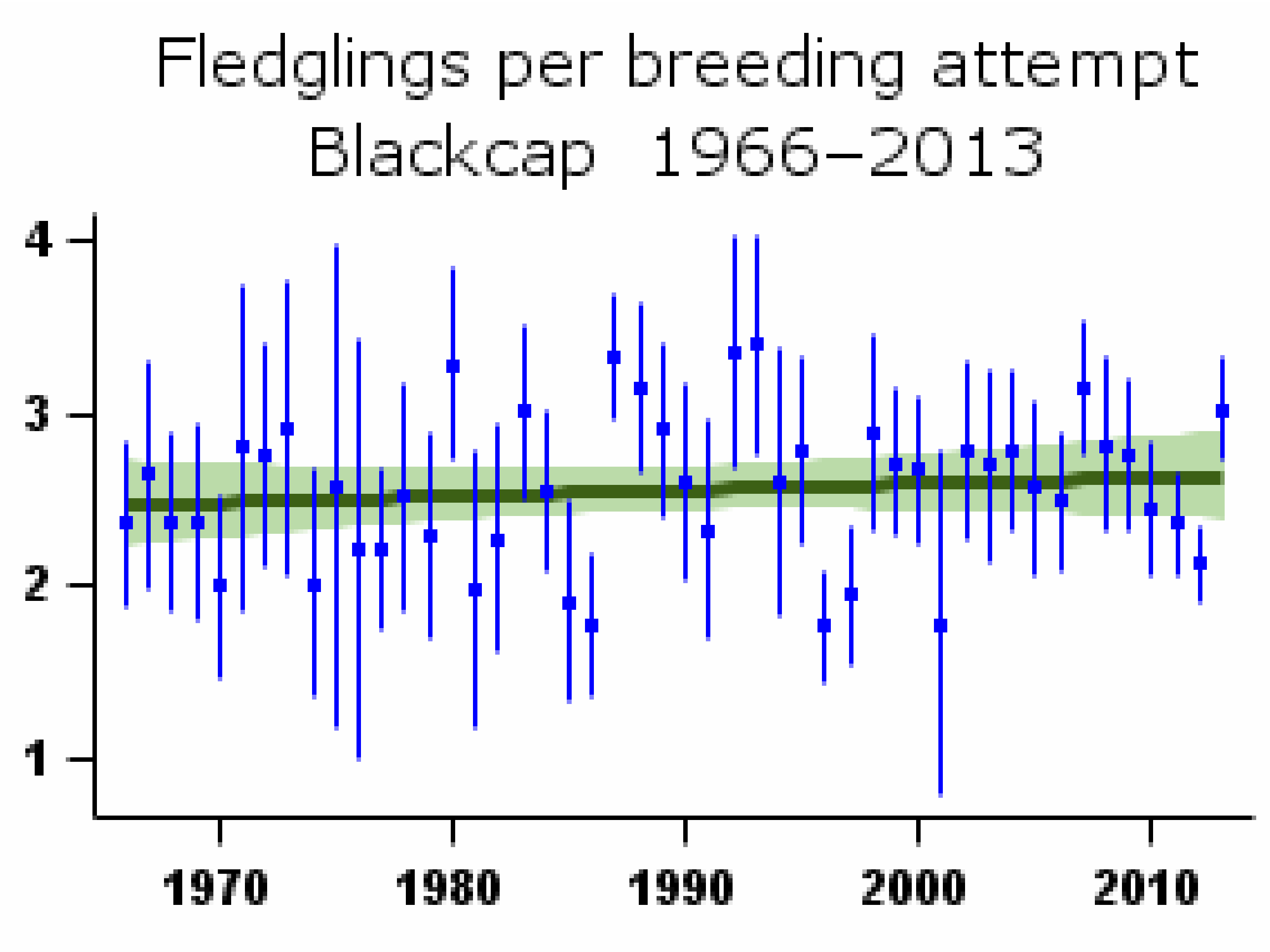
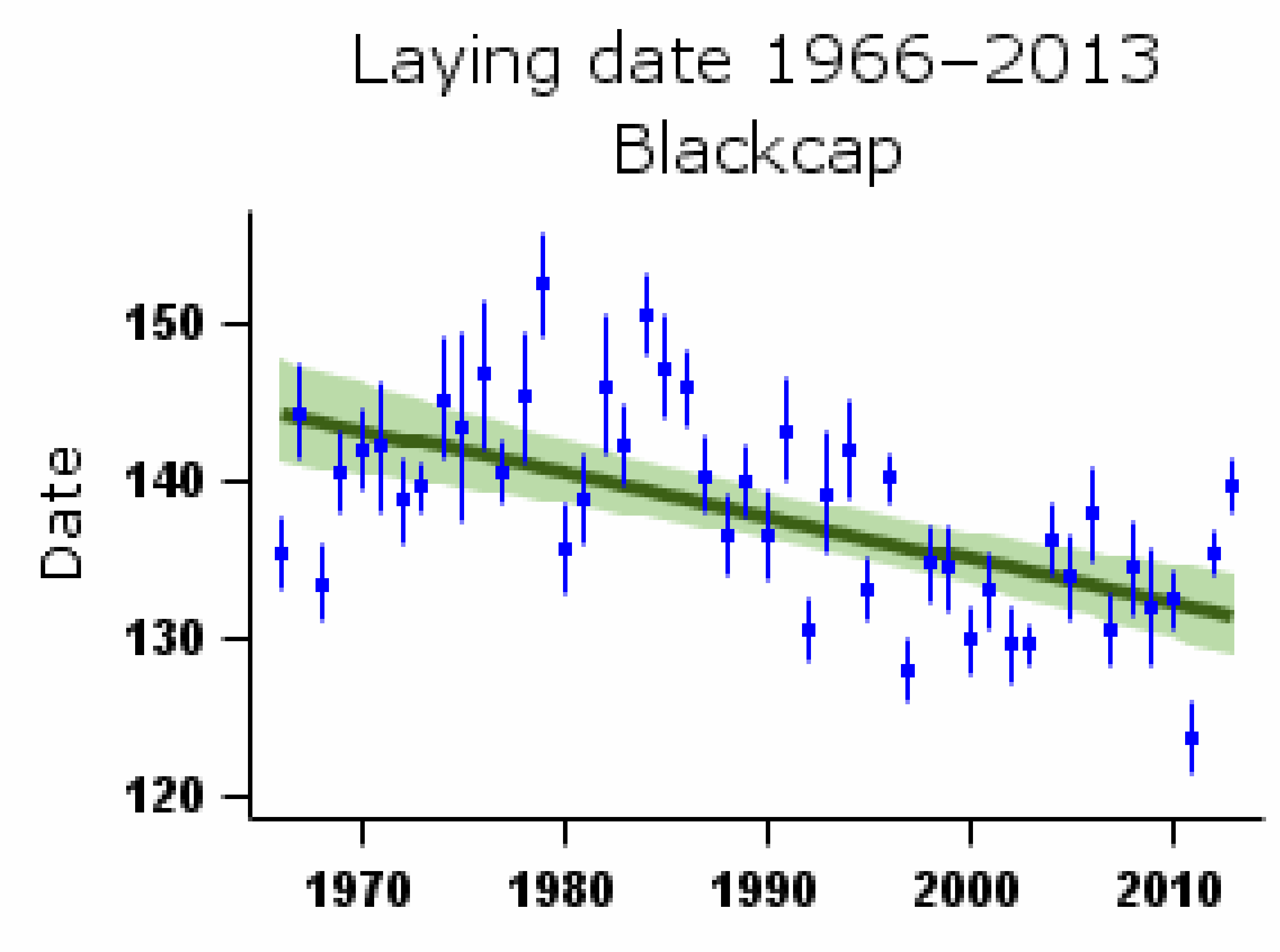


Habitat graph

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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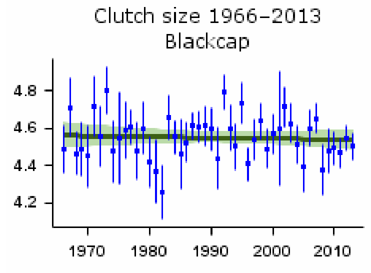
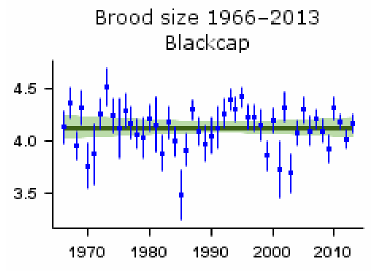
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	40	None					
Clutch size	44	1968-2012	41	None					
Brood size	44	1968-2012	48	None					
Nest failure rate at egg stage	44	1968-2012	53	Curvilinear	2.32% nests/day	2.17% nests/day	-6.5%		
Nest failure rate at chick stage	44	1968-2012	41	None					
Laying date	44	1968-2012	42	Linear decline	May 24	May 12	-12 days		
Juvenile to Adult ratio (CES)	28	1984-2012	99	Smoothed trend	174 Index value	100 Index value	-43%	>25	
Juvenile to Adult ratio (CES)	25	1987-2012	105	Smoothed trend	175 Index value	100 Index value	-43%	>25	
Juvenile to Adult ratio (CES)	10	2002-2012	108	Smoothed trend	147 Index value	100 Index value	-32%	>25	
Juvenile to Adult ratio (CES)	5	2007-2012	107	Smoothed trend	139 Index value	100 Index value	-28%	>25	

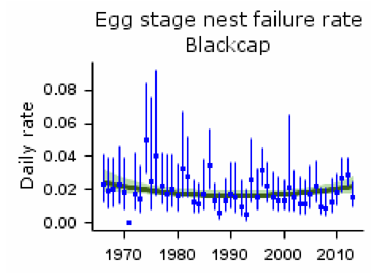
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



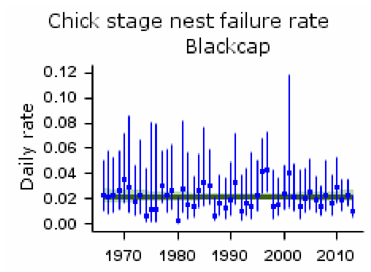
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



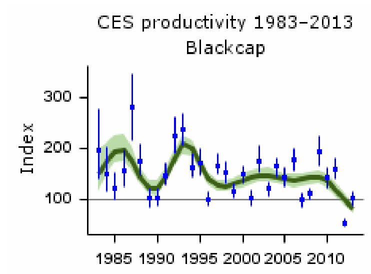
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



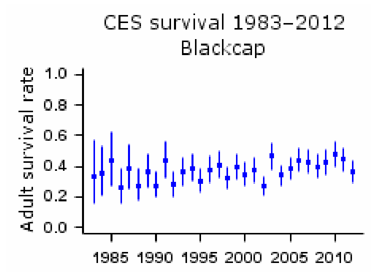
Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



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

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

According to CES, productivity has fluctuated markedly, obscuring any long-term trend in CES or NRS data. 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 almost two weeks 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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Garden Warbler

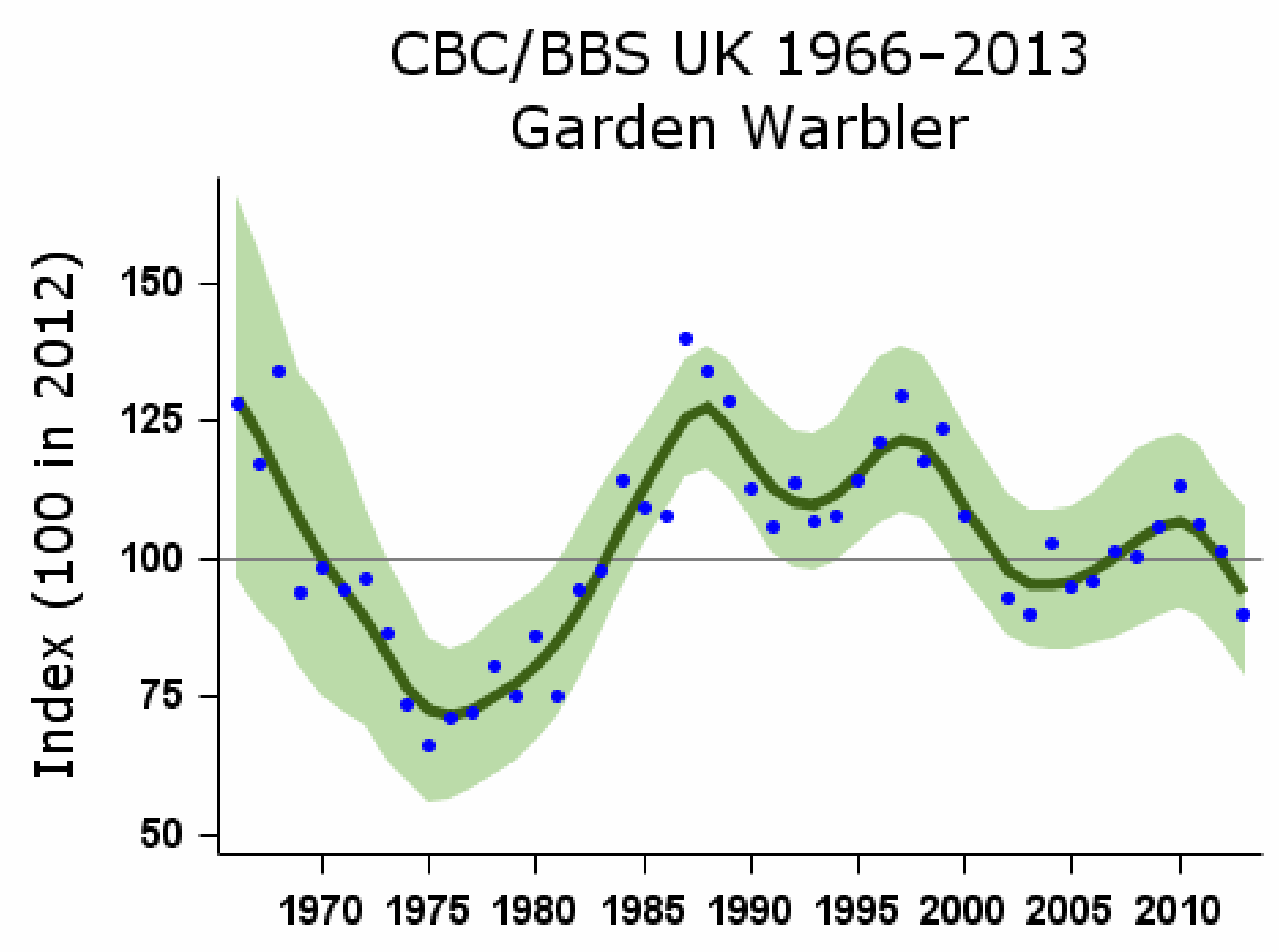
Sylvia borin

Key facts

Conservation listings:	Europe: no SPEC category (concentrated in Europe, conservation status favourable) (BiE04) UK: green (BoCC3)
Long-term trend:	UK: shallow decline England: moderate 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 data suggest that the population may be in long-term decline. The BBS PECBMS 2014a).



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

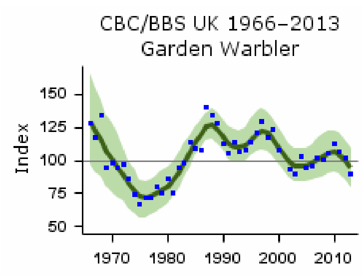
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	45	1967-2012	240	-18	-47	29		
	25	1987-2012	369	-21	-36	-5		
	10	2002-2012	480	2	-8	13		
	5	2007-2012	533	0	-8	7		
CBC/BBS England	45	1967-2012	201	-30	-50	11		

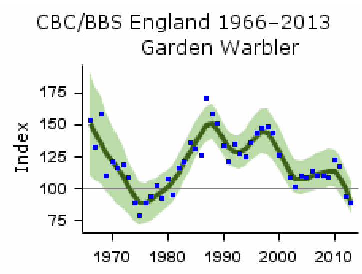
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	25	1987-2012	306	-33	-44	-18	>25	
	10	2002-2012	392	-11	-18	-2		
	5	2007-2012	436	-10	-16	-3		
CES adults	28	1984-2012	64	-15	-47	31		
	25	1987-2012	69	-20	-46	7		
	10	2002-2012	63	4	-10	18		
	5	2007-2012	65	-9	-21	4		
CES juveniles	28	1984-2012	64	-55	-69	-17	>50	
	25	1987-2012	68	-44	-60	-24	>25	
	10	2002-2012	64	-31	-42	-13	>25	
	5	2007-2012	60	-41	-51	-29	>25	
BBS UK	17	1995-2012	451	-14	-23	-4		
	10	2002-2012	480	4	-5	15		
	5	2007-2012	533	0	-7	10		
BBS England	17	1995-2012	369	-28	-35	-19	>25	
	10	2002-2012	392	-11	-19	-1		
	5	2007-2012	436	-10	-15	-3		
BBS Wales	17	1995-2012	57	-11	-34	24		
	10	2002-2012	60	21	-1	53		
	5	2007-2012	64	16	-4	36		

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

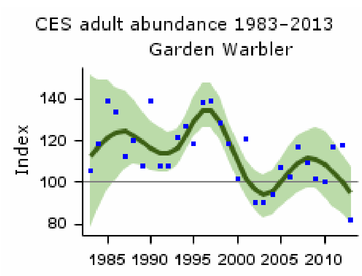
BTO JNCC rspb The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



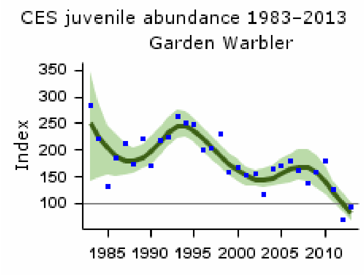
CBC/BBS UK graph



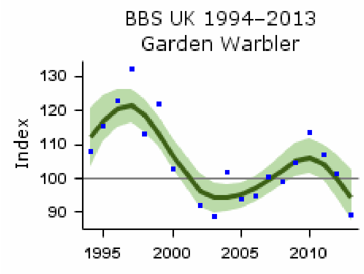
CBC/BBS England graph



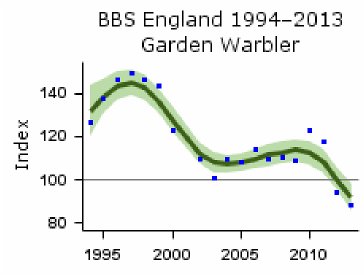
CES adults graph



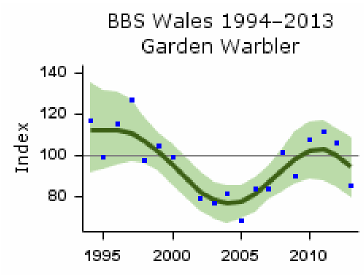
CES juveniles graph



BBS UK graph

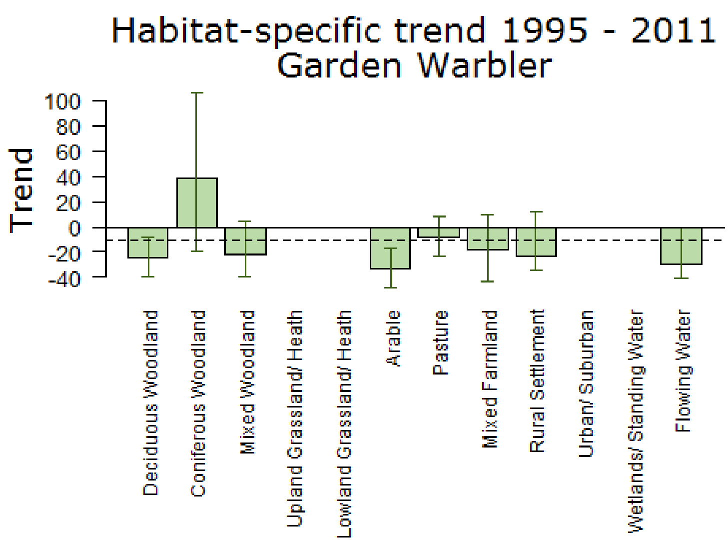


BBS England graph



BBS Wales graph

Population trends by habitat



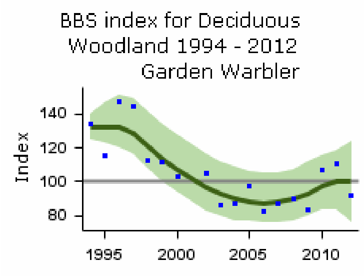
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

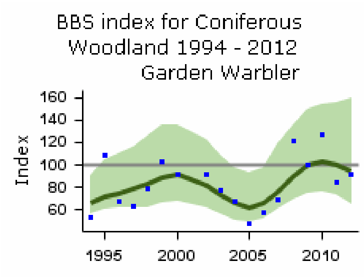
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	144	-24	-40	-8
Coniferous Woodland	16	1995-2011	31	38	-19	106
Mixed Woodland	16	1995-2011	87	-22	-40	4
Arable	16	1995-2011	85	-33	-48	-17
Pasture	16	1995-2011	165	-9	-23	9
Mixed Farmland	16	1995-2011	49	-18	-44	9
Rural Settlement	16	1995-2011	66	-23	-34	12
Flowing Water	16	1995-2011	62	-29	-41	0

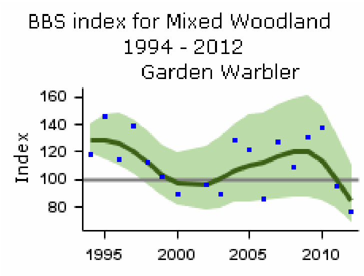
Further information on habitat-specific trends, please follow link here.



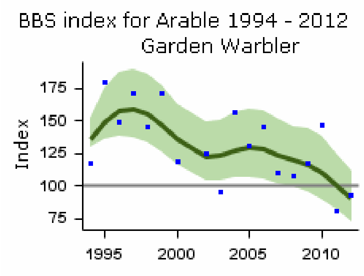
Habitat graph



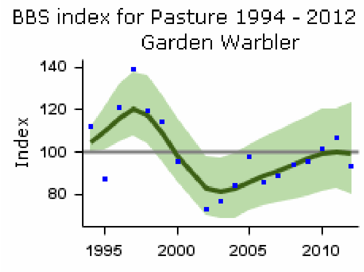
Habitat graph



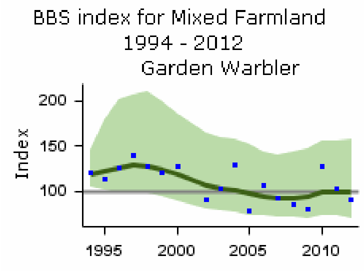
Habitat graph



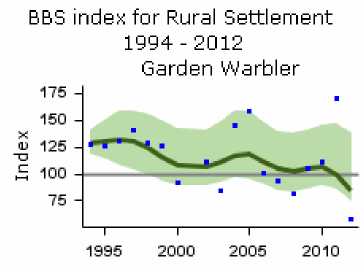
Habitat graph



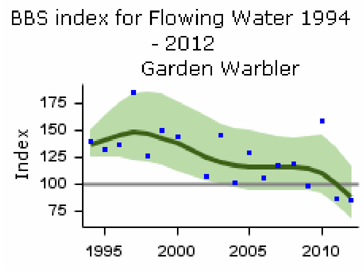
Habitat graph



Habitat graph

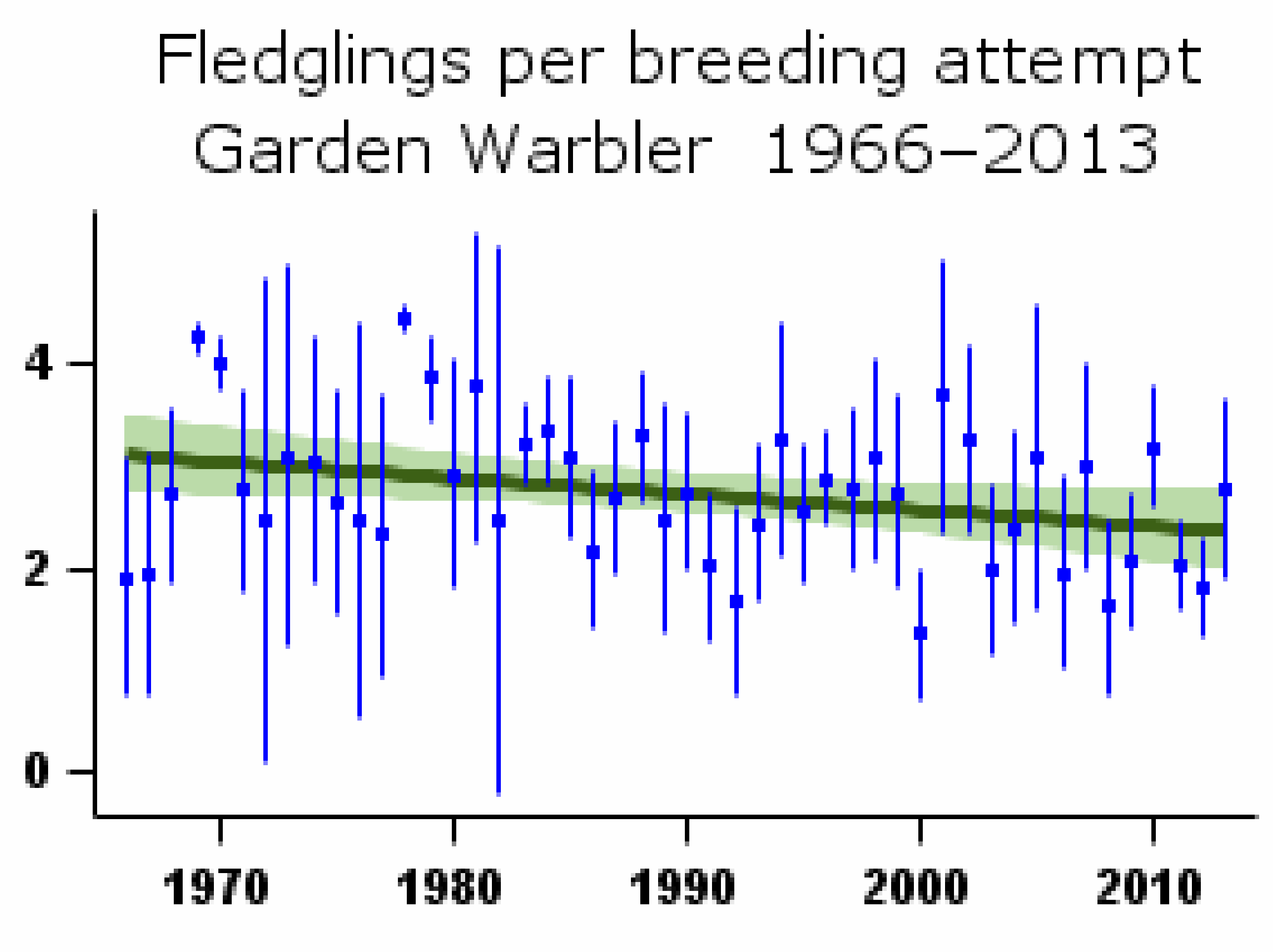


Habitat graph

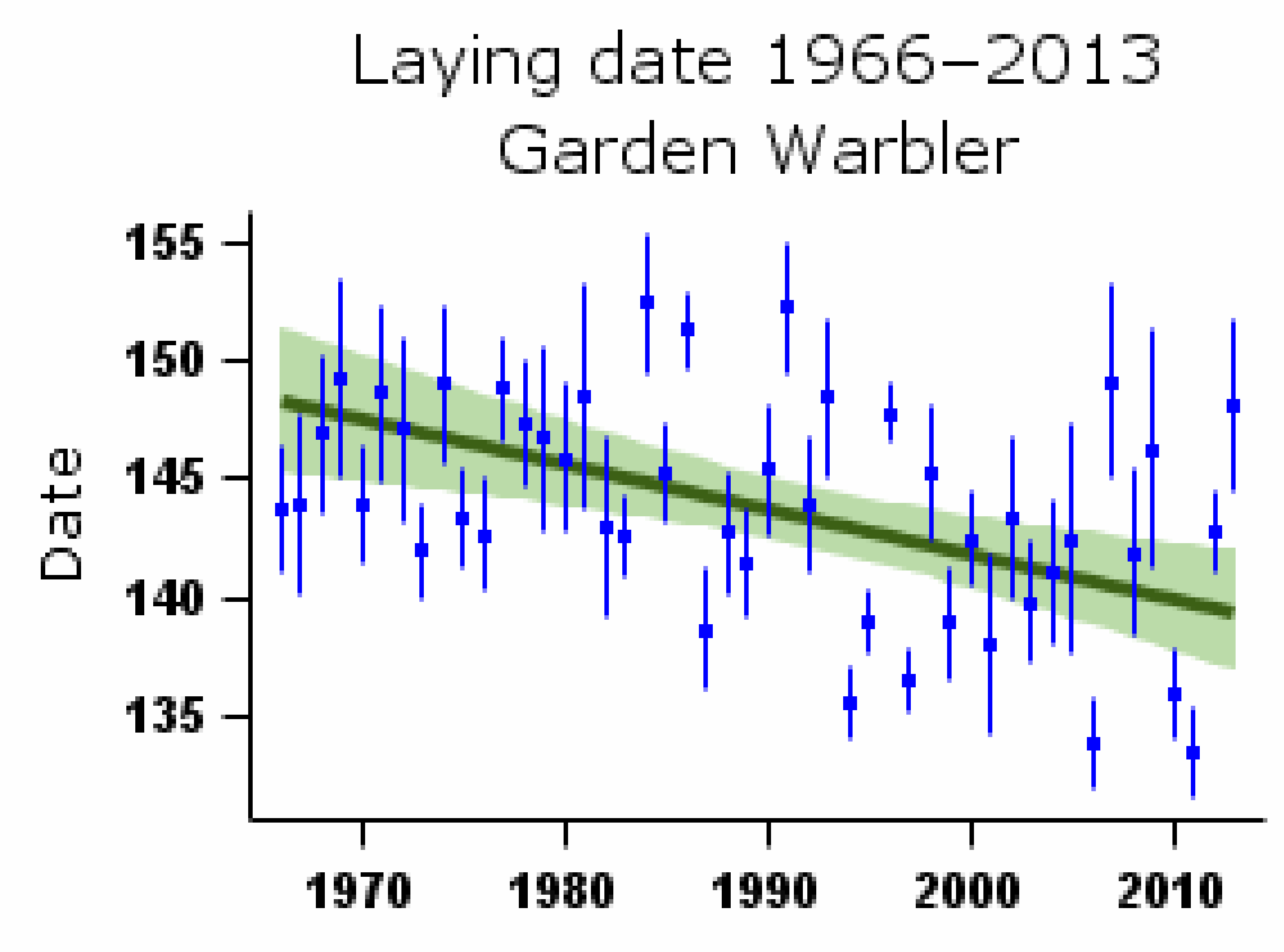


Habitat graph

Demographic trends



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

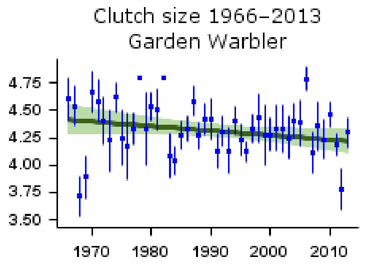


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

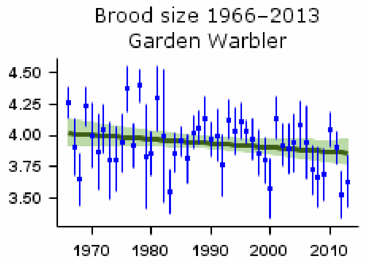
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	19	Linear decline	3.06 fledglings	2.38 fledglings	-22.4%		
Clutch size	44	1968-2012	17	None					Small sample
Brood size	44	1968-2012	25	None					Small sample
Nest failure rate at egg stage	44	1968-2012	23	Curvilinear	1.73% nests/day	2.32% nests/day	34.1%		Small sample
Nest failure rate at chick stage	44	1968-2012	20	Linear increase	1.09% nests/day	2.77% nests/day	154.1%		Small sample
Laying date	44	1968-2012	22	Linear decline	May 28	May 20	-8 days		Small sample
Juvenile to Adult ratio (CES)	28	1984-2012	78	Smoothed trend	209 Index value	100 Index value	-52%	>50	
Juvenile to Adult ratio (CES)	25	1987-2012	83	Smoothed trend	184 Index value	100 Index value	-46%	>25	
Juvenile to Adult ratio (CES)	10	2002-2012	79	Smoothed trend	123 Index value	100 Index value	-19%		
Juvenile to Adult ratio (CES)	5	2007-2012	78	Smoothed trend	114 Index value	100 Index value	-12%		

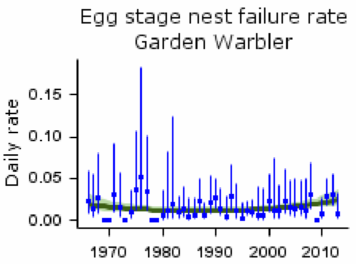
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



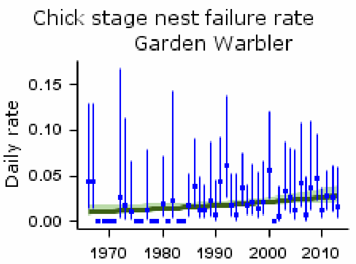
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



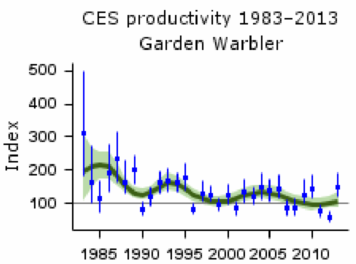
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



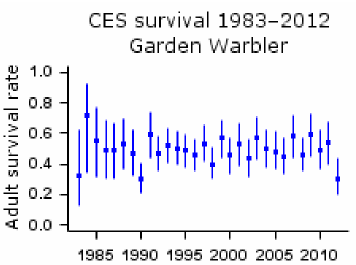
Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Lesser Whitethroat

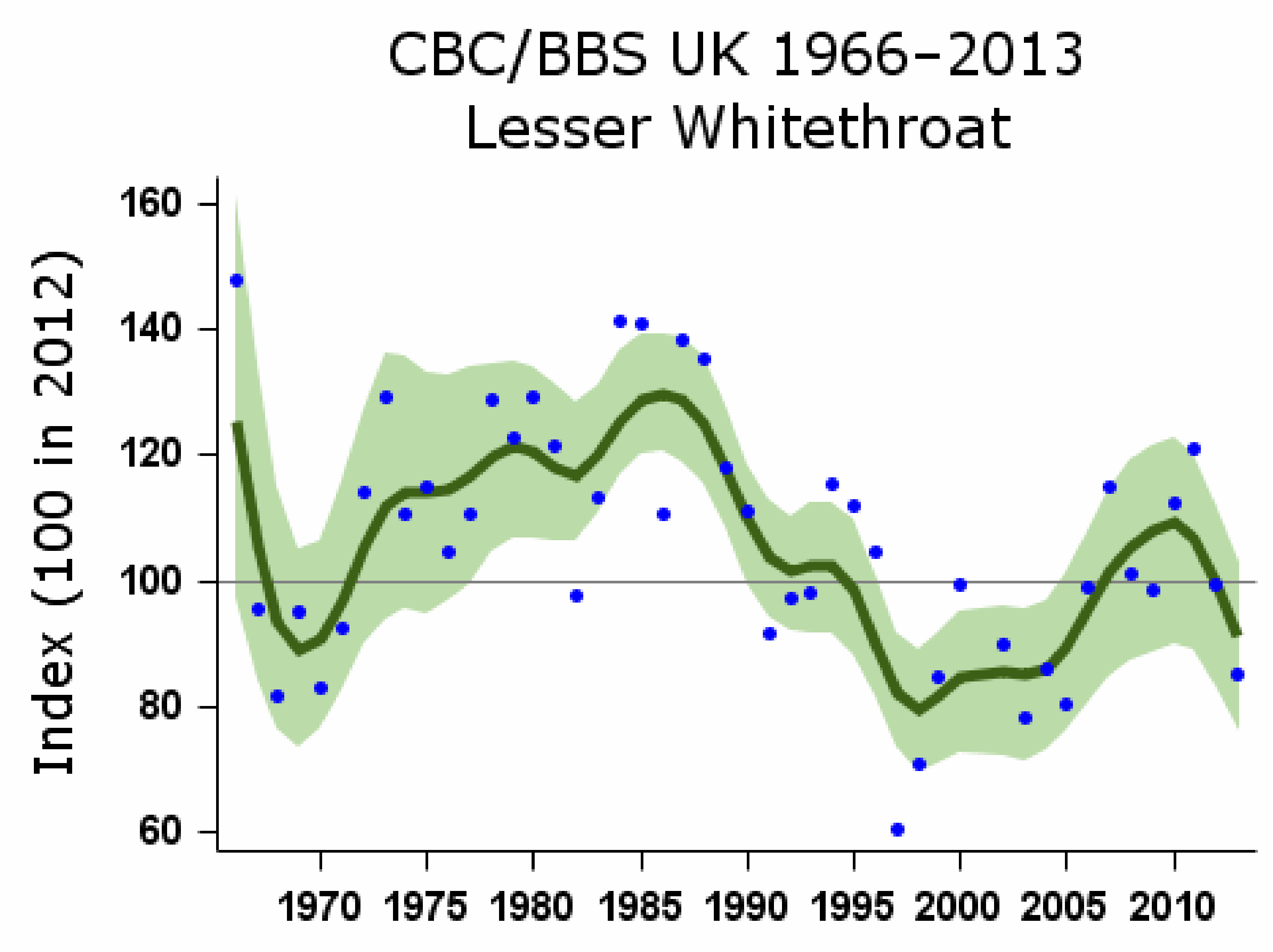
Sylvia curruca

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. A northward redistribution of the UK breeding population (Balmer et al. 2013) may go some way to explaining inconsistencies in the monitoring results. 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 2014a).



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

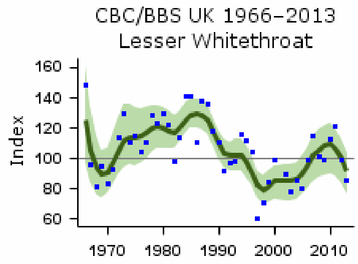
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	45	1967-2012	148	-5	-40	36		
	25	1987-2012	223	-22	-38	-6		
	10	2002-2012	308	17	3	32		
	5	2007-2012	348	-2	-9	7		

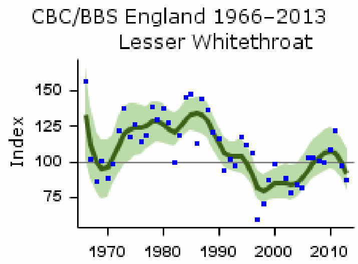
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	45	1967-2012	142	-11	-37	32		
	25	1987-2012	213	-25	-39	-7		
	10	2002-2012	294	17	6	33		
	5	2007-2012	332	1	-7	10		
CES adults	28	1984-2012	38	-68	-82	-54	>50	
	25	1987-2012	39	-74	-84	-65	>50	
	10	2002-2012	34	-37	-54	-19	>25	
	5	2007-2012	31	-24	-42	2		
CES juveniles	28	1984-2012	44	-64	-80	-31	>50	
	25	1987-2012	47	-68	-80	-53	>50	
	10	2002-2012	42	-41	-60	-19	>25	
	5	2007-2012	39	-33	-54	-10	>25	
BBS UK	17	1995-2012	272	-6	-20	6		
	10	2002-2012	308	19	7	35		
	5	2007-2012	348	-2	-9	7		
BBS England	17	1995-2012	260	-5	-18	5		
	10	2002-2012	294	19	5	33		
	5	2007-2012	332	1	-7	10		

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

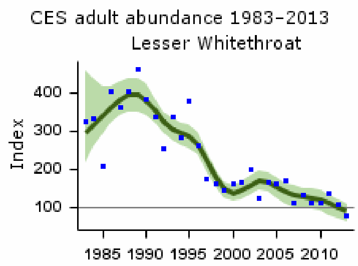
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



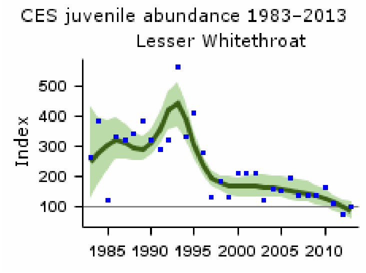
CBC/BBS UK graph



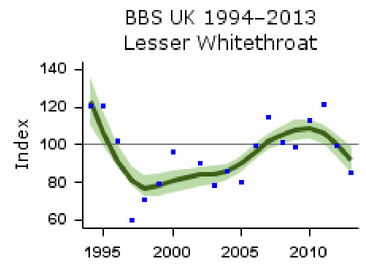
CBC/BBS England graph



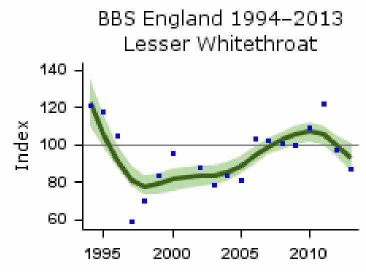
CES adults graph



CES juveniles graph

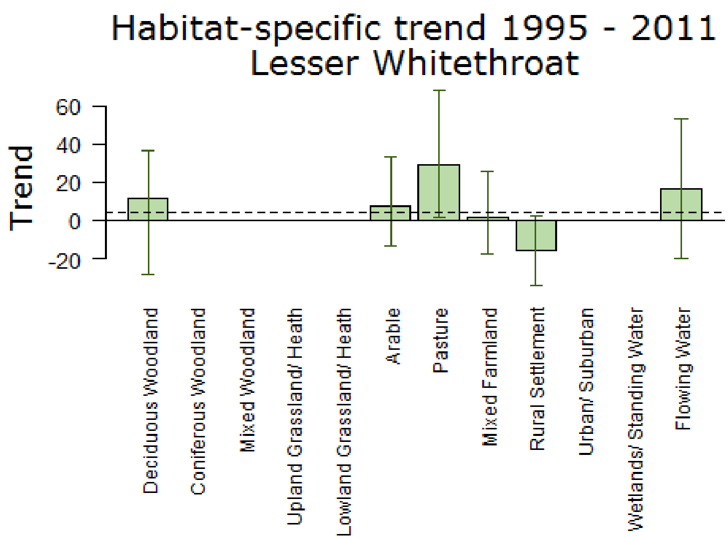


BBS UK graph



BBS England graph

Population trends by habitat



Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

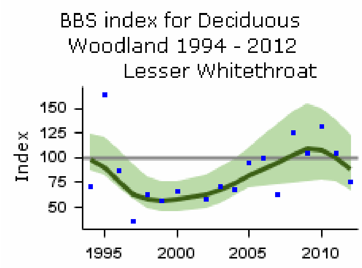
Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

More on habitat trends

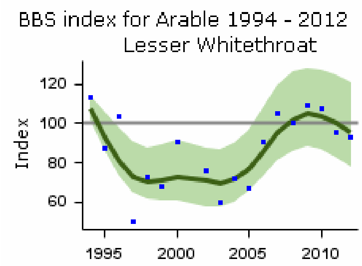
Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	40	12	-28	36

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Arable	16	1995-2011	81	8	-13	33
Pasture	16	1995-2011	102	29	2	68
Mixed Farmland	16	1995-2011	62	2	-17	26
Rural Settlement	16	1995-2011	53	-16	-34	2
Flowing Water	16	1995-2011	34	16	-20	53

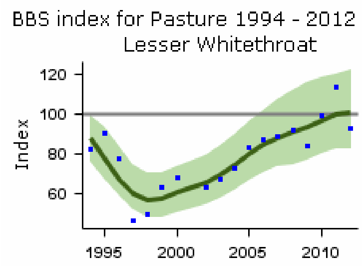
Further information on habitat-specific trends, please follow link here.



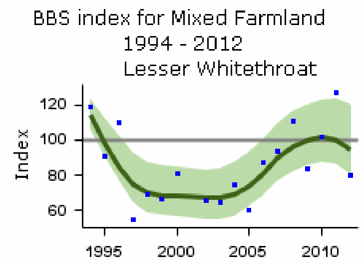
Habitat graph



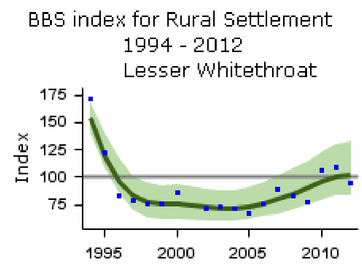
Habitat graph



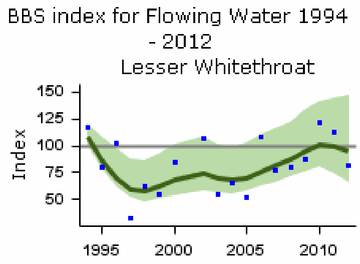
Habitat graph



Habitat graph



Habitat graph

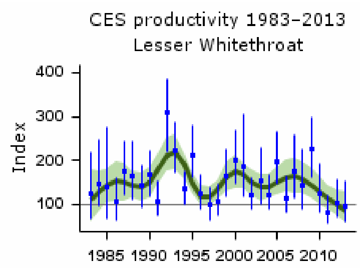


Habitat graph

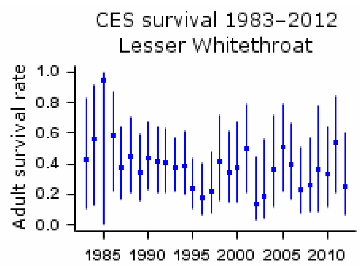
Demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Juvenile to Adult ratio (CES)	28	1984-2012	53	Smoothed trend	128 Index value	100 Index value	-22%		
Juvenile to Adult ratio (CES)	25	1987-2012	56	Smoothed trend	151 Index value	100 Index value	-34%		
Juvenile to Adult ratio (CES)	10	2002-2012	51	Smoothed trend	150 Index value	100 Index value	-33%	>25	
Juvenile to Adult ratio (CES)	5	2007-2012	48	Smoothed trend	163 Index value	100 Index value	-39%	>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.



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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Whitethroat

Sylvia communis

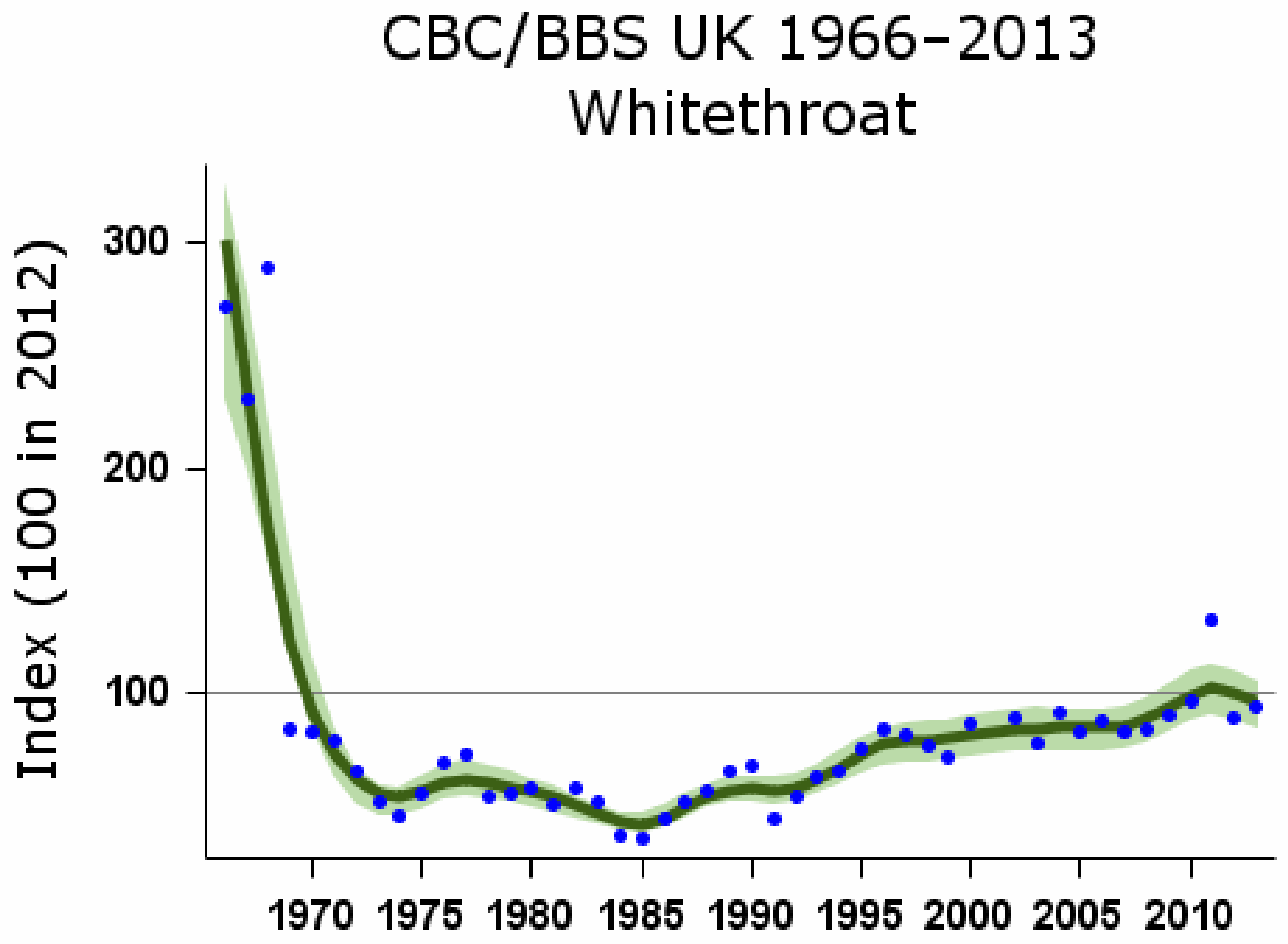
Key facts

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
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 West African wintering grounds in autumn 1968, crashed by around 70% between the 1968 and 1969 breeding seasons (Winstanley et al. 1974). 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 2014a). 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).



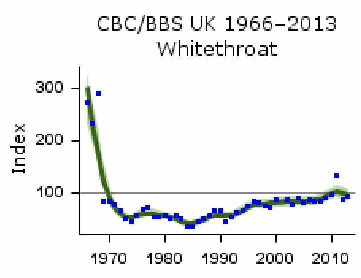
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

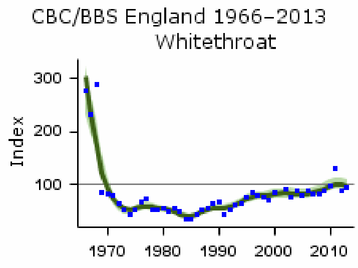
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	45	1967-2012	622	-57	-69	-42	>50	
	25	1987-2012	1021	103	76	134		
	10	2002-2012	1550	19	16	26		
	5	2007-2012	1745	17	14	23		
CBC/BBS England	45	1967-2012	538	-57	-68	-42	>50	
	25	1987-2012	882	108	83	138		
	10	2002-2012	1331	19	15	25		
	5	2007-2012	1500	19	16	23		
WBS/WBBS waterways	37	1975-2012	82	160	1	400		
	25	1987-2012	108	243	140	409		
	10	2002-2012	156	16	3	28		
	5	2007-2012	144	18	3	31		
CES adults	28	1984-2012	63	-24	-46	5		
	25	1987-2012	68	-17	-37	14		
	10	2002-2012	71	2	-14	26		
	5	2007-2012	72	38	26	56		
CES juveniles	28	1984-2012	68	35	-21	237		
	25	1987-2012	73	38	-21	167		
	10	2002-2012	75	3	-16	30		
	5	2007-2012	75	37	5	74		
BBS UK	17	1995-2012	1369	35	27	45		
	10	2002-2012	1550	20	16	26		
	5	2007-2012	1745	16	14	21		
BBS England	17	1995-2012	1180	34	27	43		
	10	2002-2012	1331	19	15	25		
	5	2007-2012	1500	18	15	22		
BBS Scotland	17	1995-2012	84	93	43	150		
	10	2002-2012	98	22	3	53		
	5	2007-2012	116	5	-8	24		
BBS Wales	17	1995-2012	84	-9	-22	6		
	10	2002-2012	94	22	8	43		
	5	2007-2012	99	18	9	31		

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

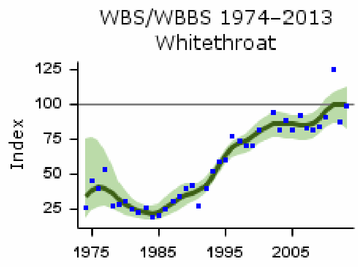
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



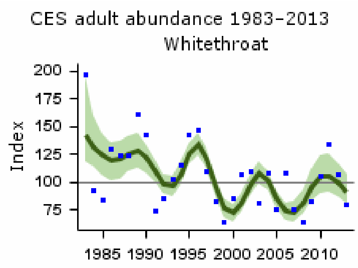
CBC/BBS UK graph



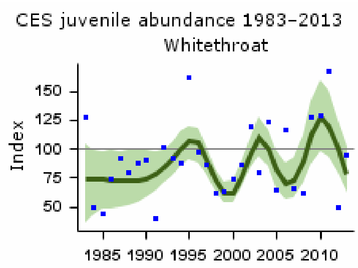
CBC/BBS England graph



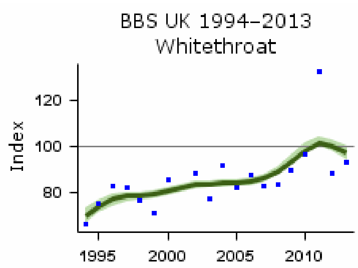
WBS/WBBS waterways graph



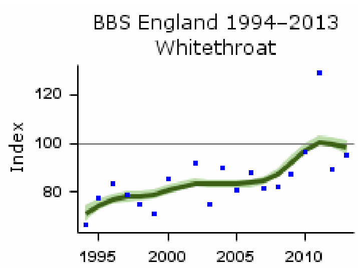
CES adults graph



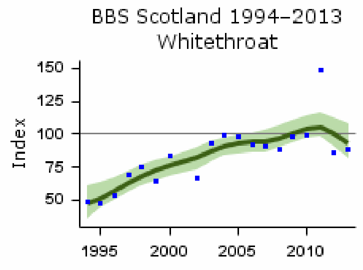
CES juveniles graph



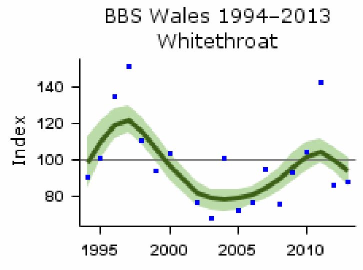
BBS UK graph



BBS England graph

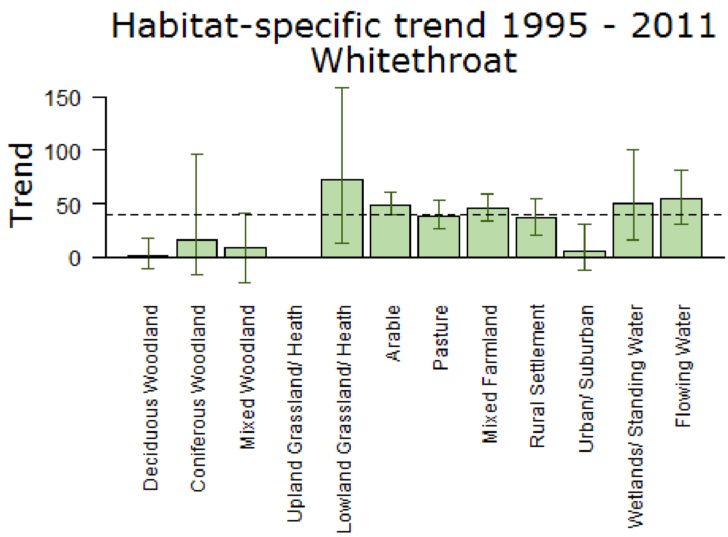


BBS Scotland graph



BBS Wales graph

Population trends by habitat



Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

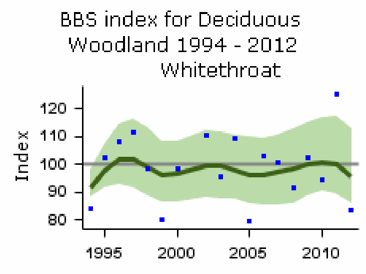
Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

More on habitat trends

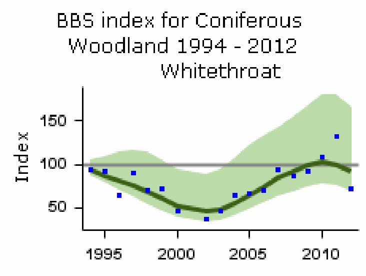
Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	290	2	-10	18
Coniferous Woodland	16	1995-2011	39	16	-17	97
Mixed Woodland	16	1995-2011	108	8	-23	41
Lowland Grassland/ Heath	16	1995-2011	70	72	14	158
Arable	16	1995-2011	527	49	40	61
Pasture	16	1995-2011	586	38	26	54
Mixed Farmland	16	1995-2011	397	45	34	60
Rural Settlement	16	1995-2011	326	37	21	55
Urban/ Suburban	16	1995-2011	97	7	-12	31
Wetlands/ Standing Water	16	1995-2011	48	51	16	101

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Flowing Water	16	1995-2011	192	55	31	81

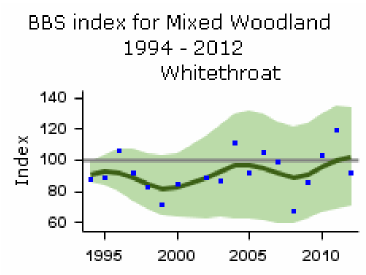
Further information on habitat-specific trends, please follow link here.



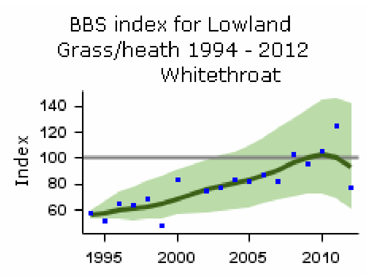
Habitat graph



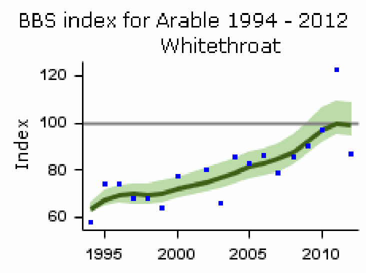
Habitat graph



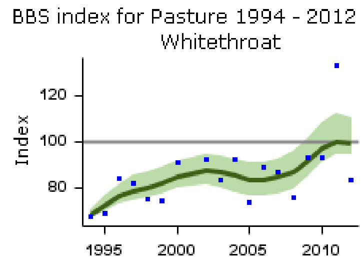
Habitat graph



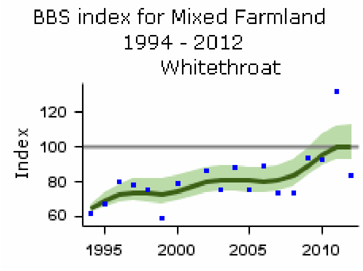
Habitat graph



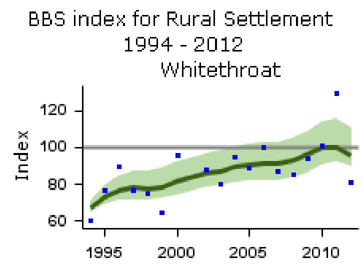
Habitat graph



Habitat graph



Habitat graph



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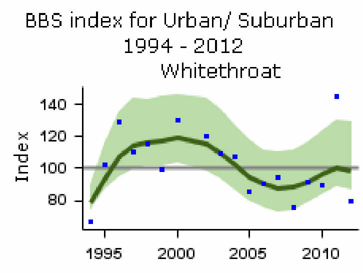

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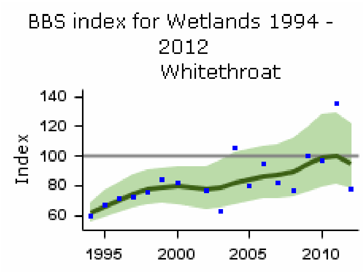
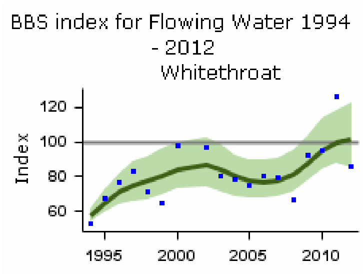
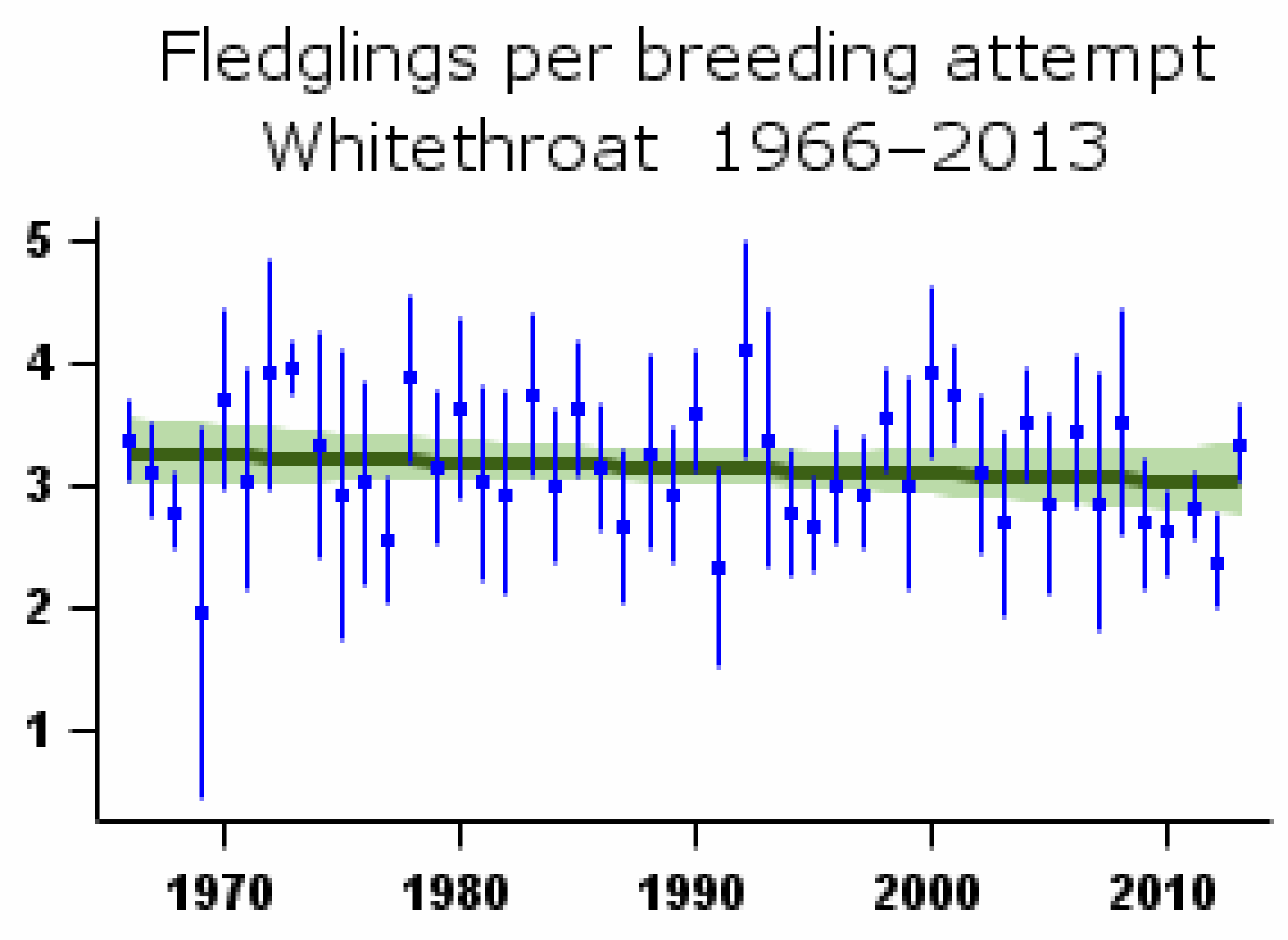


Habitat graph

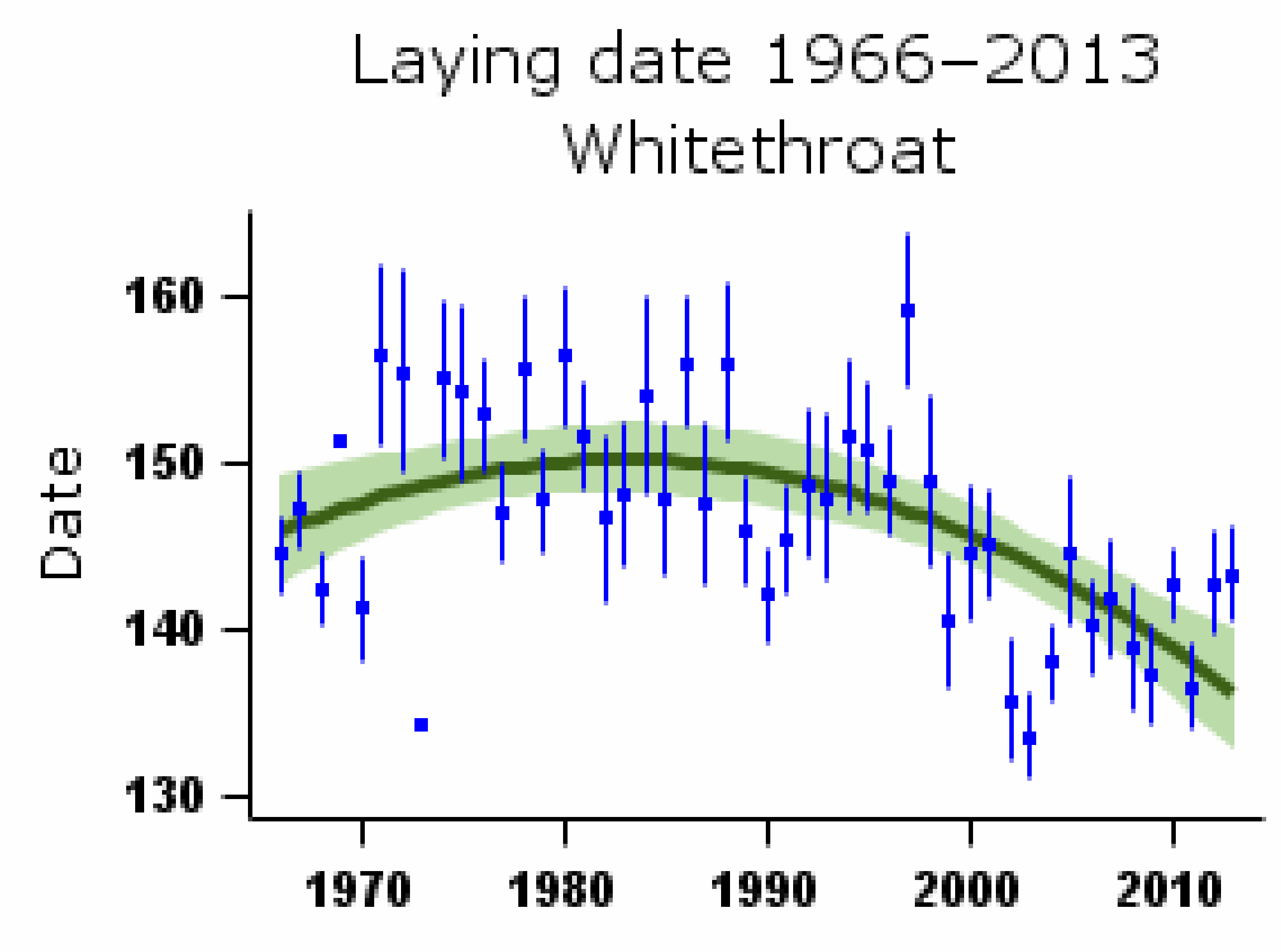


Habitat graph

Demographic trends



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

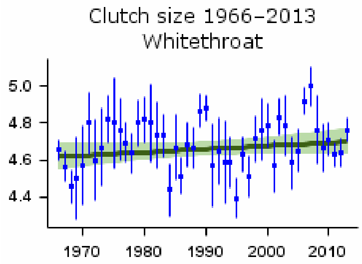


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

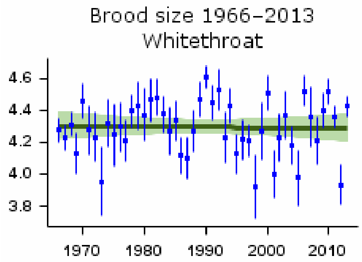
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	44	None					
Clutch size	44	1968-2012	32	None					
Brood size	44	1968-2012	70	None					
Nest failure rate at egg stage	44	1968-2012	45	Curvilinear	1.02% nests/day	1.79% nests/day	75.5%		
Nest failure rate at chick stage	44	1968-2012	52	None					
Laying date	44	1968-2012	21	Curvilinear	May 27	May 17	-10 days		Small sample
Juvenile to Adult ratio (CES)	28	1984-2012	78	Smoothed trend	92 Index value	100 Index value	9%		
Juvenile to Adult ratio (CES)	25	1987-2012	83	Smoothed trend	167 Index value	100 Index value	-40%	>25	
Juvenile to Adult ratio (CES)	10	2002-2012	85	Smoothed trend	141 Index value	100 Index value	-29%	>25	
Juvenile to Adult ratio (CES)	5	2007-2012	87	Smoothed trend	104 Index value	100 Index value	-4%		

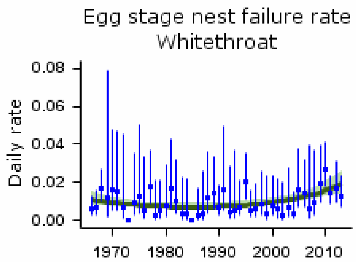
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



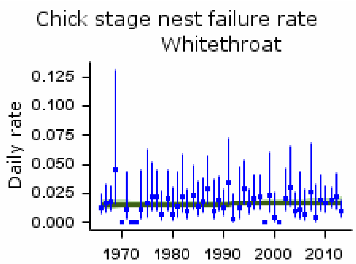
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



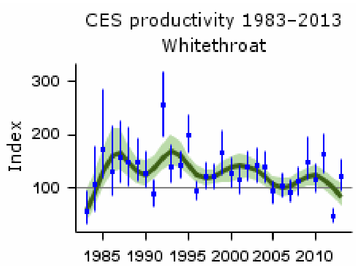
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



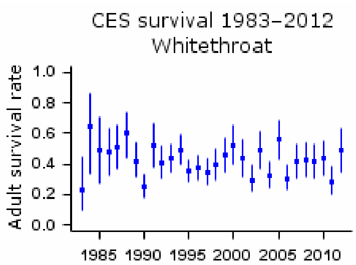
Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Grasshopper Warbler

Locustella naevia

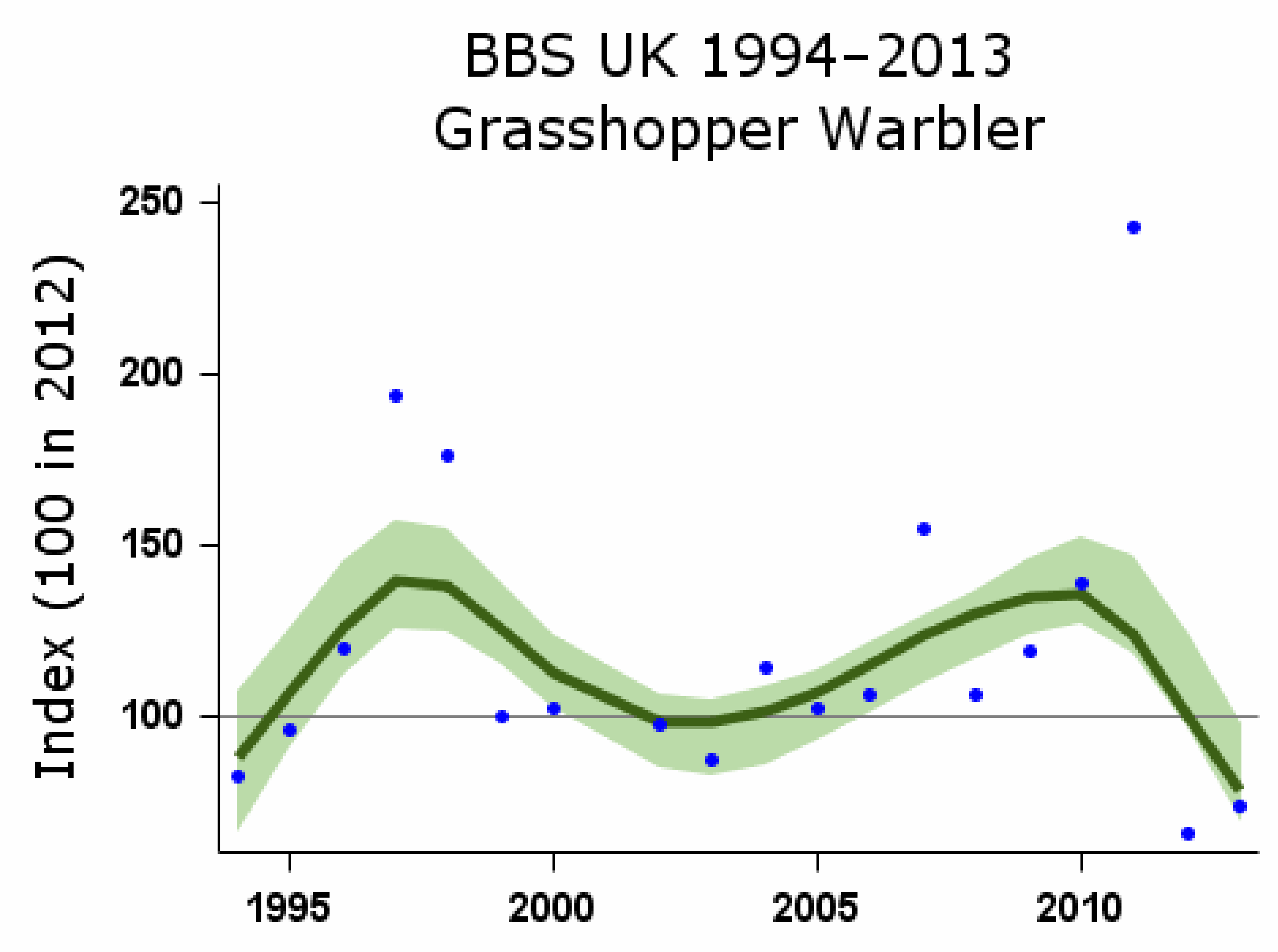
Key facts

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: 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, bu no clear trend. There have been fluctuations but little overall change across Europe since 1980 (PECBMS 2014a).



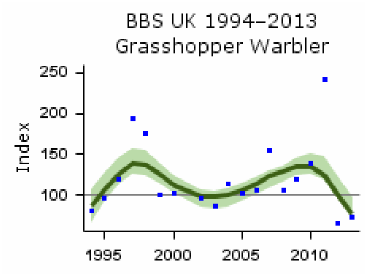
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

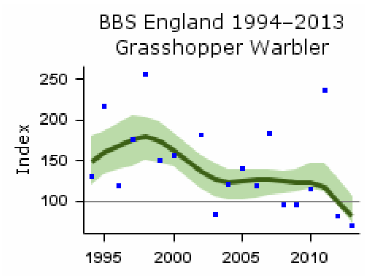
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	17	1995-2012	86	-6	-25	39		
	10	2002-2012	98	2	-7	44		
	5	2007-2012	123	-19	-21	8		
BBS England	17	1995-2012	40	-37	-48	-6	>25	
	10	2002-2012	46	-27	-36	9		
	5	2007-2012	61	-21	-26	11		

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 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 it, 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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Sedge Warbler

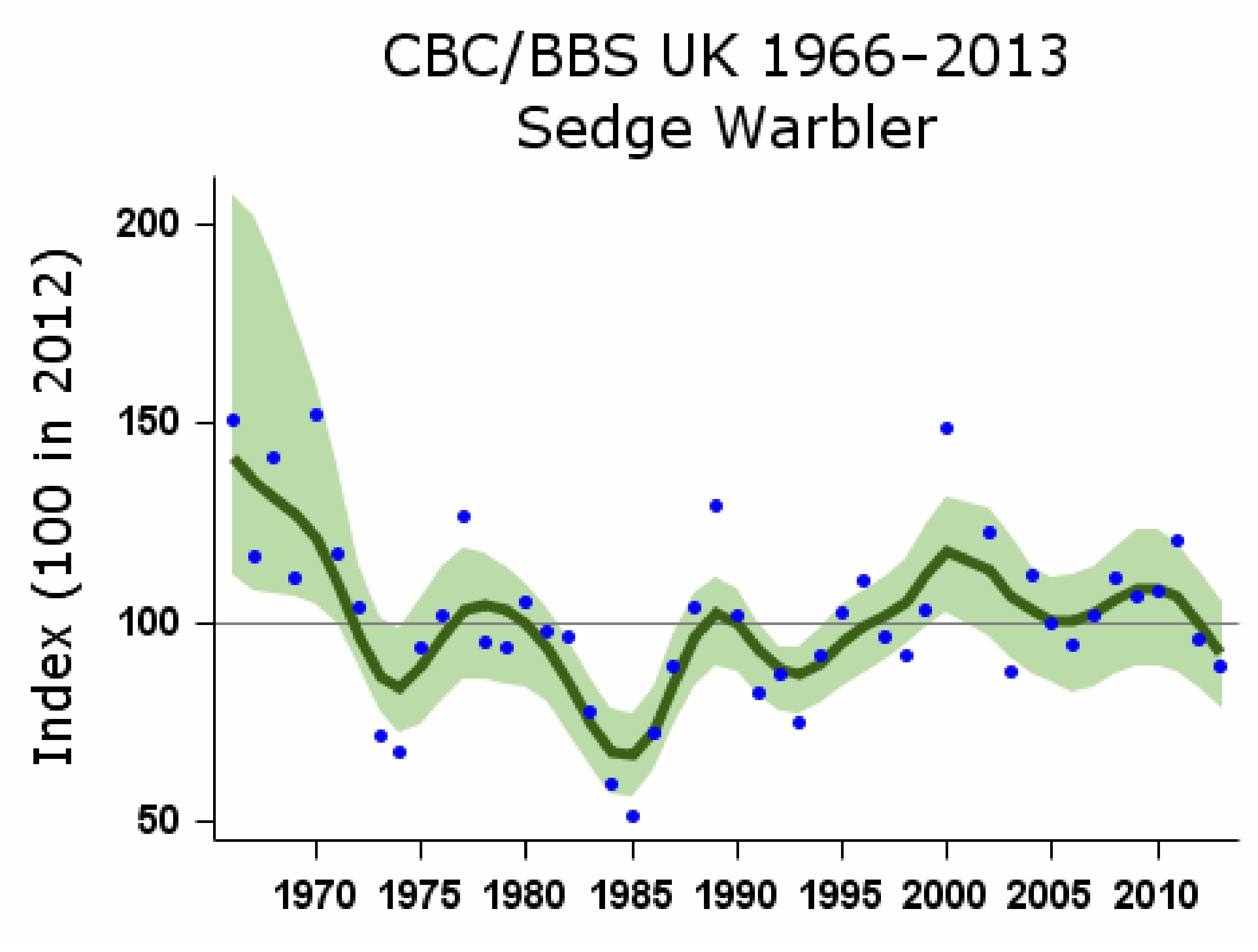
Acrocephalus schoenobaenus

Key facts

Conservation listings:	Europe: no SPEC category (concentrated in Europe, conservation status favourable) (BiE04) UK: green (BoCC3)
Long-term trend:	UK, England: moderate decline
Population size:	290,000 territories in 2009 (APEP13: 1988-91 Atlas estimate updated using CBC/BBS trend)

Status summary

The trend, though apparently a moderate decline, 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, which lie 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 increased slightly but the number of fledglings per breeding attempt has shown no change. CES productivity data show a sustained decrease since the late 1980s. There has been little long-term change across Europe since 1980 (PECBMS 2014a).



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	45	1967-2012	152	-26	-60	5		
	25	1987-2012	235	18	-7	46		
	10	2002-2012	329	-11	-25	0		

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	45	1967-2012	102	-34	-60	0		
	25	1987-2012	152	9	-17	34		
	10	2002-2012	211	-13	-24	-1		
	5	2007-2012	233	4	-5	15		
WBS/WBBS waterways	37	1975-2012	71	-47	-64	-22	>25	
	25	1987-2012	89	-37	-49	-18	>25	
	10	2002-2012	116	-32	-41	-23	>25	
	5	2007-2012	101	-15	-24	-4		
CES adults	28	1984-2012	66	-42	-56	-20	>25	
	25	1987-2012	71	-56	-66	-45	>50	
	10	2002-2012	71	-38	-45	-30	>25	
	5	2007-2012	71	-9	-20	3		
CES juveniles	28	1984-2012	65	39	-37	302		
	25	1987-2012	70	-20	-48	25		
	10	2002-2012	70	-18	-37	3		
	5	2007-2012	70	-1	-19	23		
BBS UK	17	1995-2012	305	4	-13	26		
	10	2002-2012	329	-11	-24	-1		
	5	2007-2012	364	-2	-10	7		
BBS England	17	1995-2012	194	-7	-24	16		
	10	2002-2012	211	-12	-23	-1		
	5	2007-2012	233	3	-6	16		
BBS Scotland	17	1995-2012	56	29	-9	86		
	10	2002-2012	59	-7	-33	16		
	5	2007-2012	70	-3	-16	13		

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

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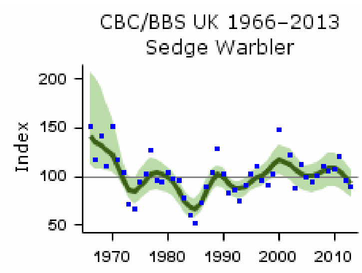
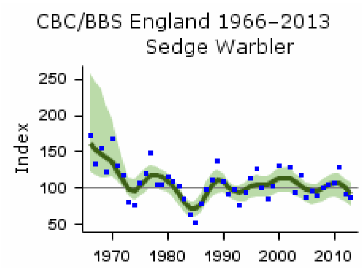
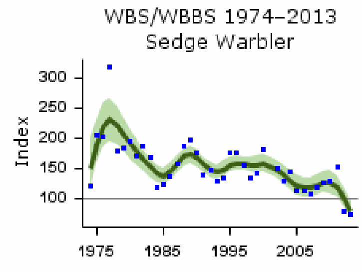


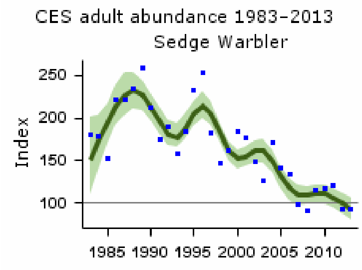
CBC/BBS UK graph



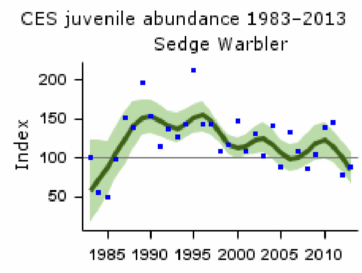
CBC/BBS England graph



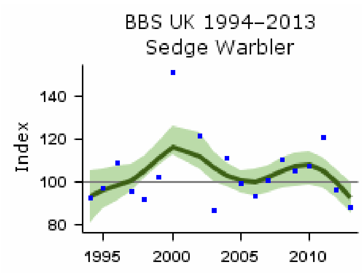
WBS/WBBS waterways graph



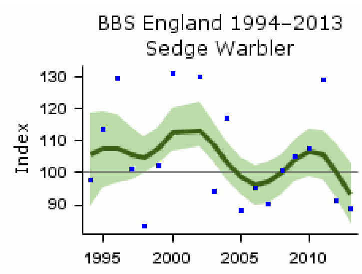
CES adults graph



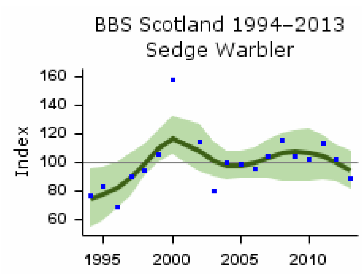
CES juveniles graph



BBS UK graph

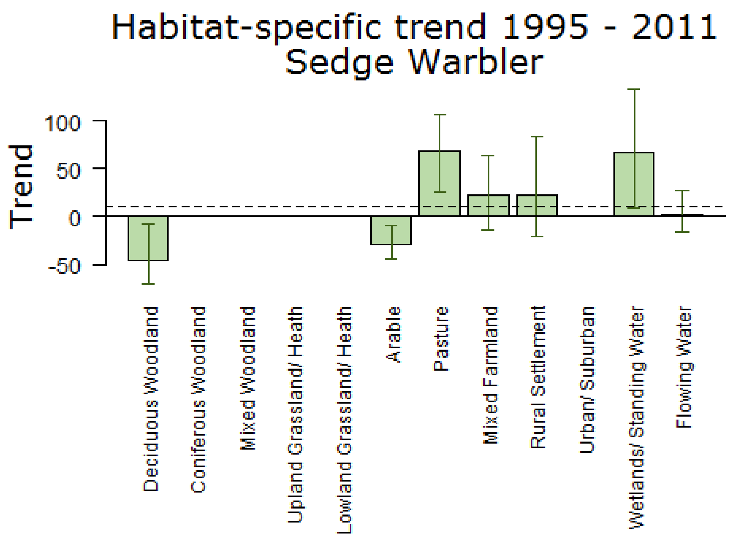


BBS England graph



BBS Scotland graph

Population trends by habitat



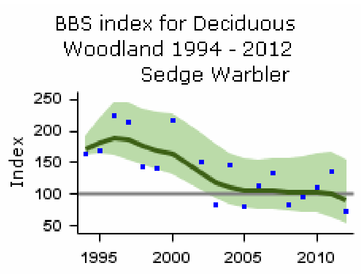
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

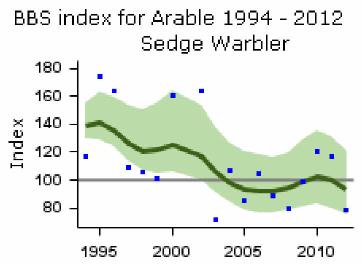
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	41	-45	-70	-8
Arable	16	1995-2011	71	-29	-45	-9
Pasture	16	1995-2011	117	68	26	106
Mixed Farmland	16	1995-2011	47	23	-13	64
Rural Settlement	16	1995-2011	42	22	-20	84
Wetlands/ Standing Water	16	1995-2011	40	67	9	133
Flowing Water	16	1995-2011	96	2	-16	27

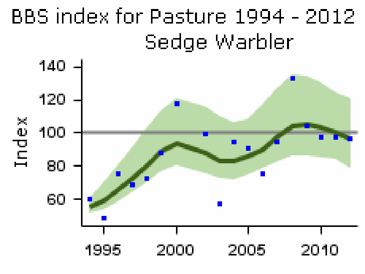
Further information on habitat-specific trends, please follow link here.



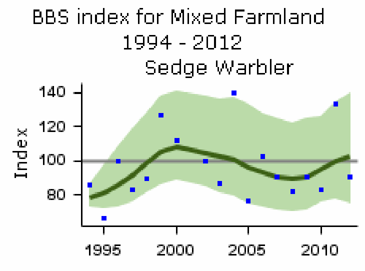
Habitat graph



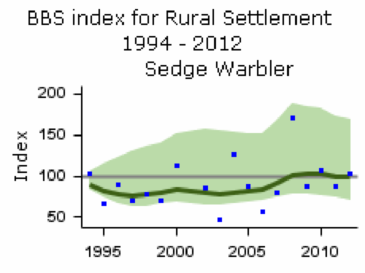
Habitat graph



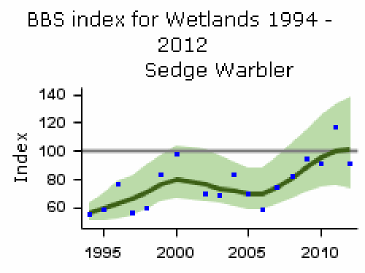
Habitat graph



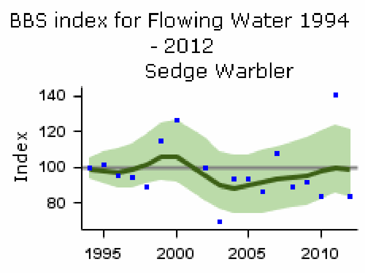
Habitat graph



Habitat graph

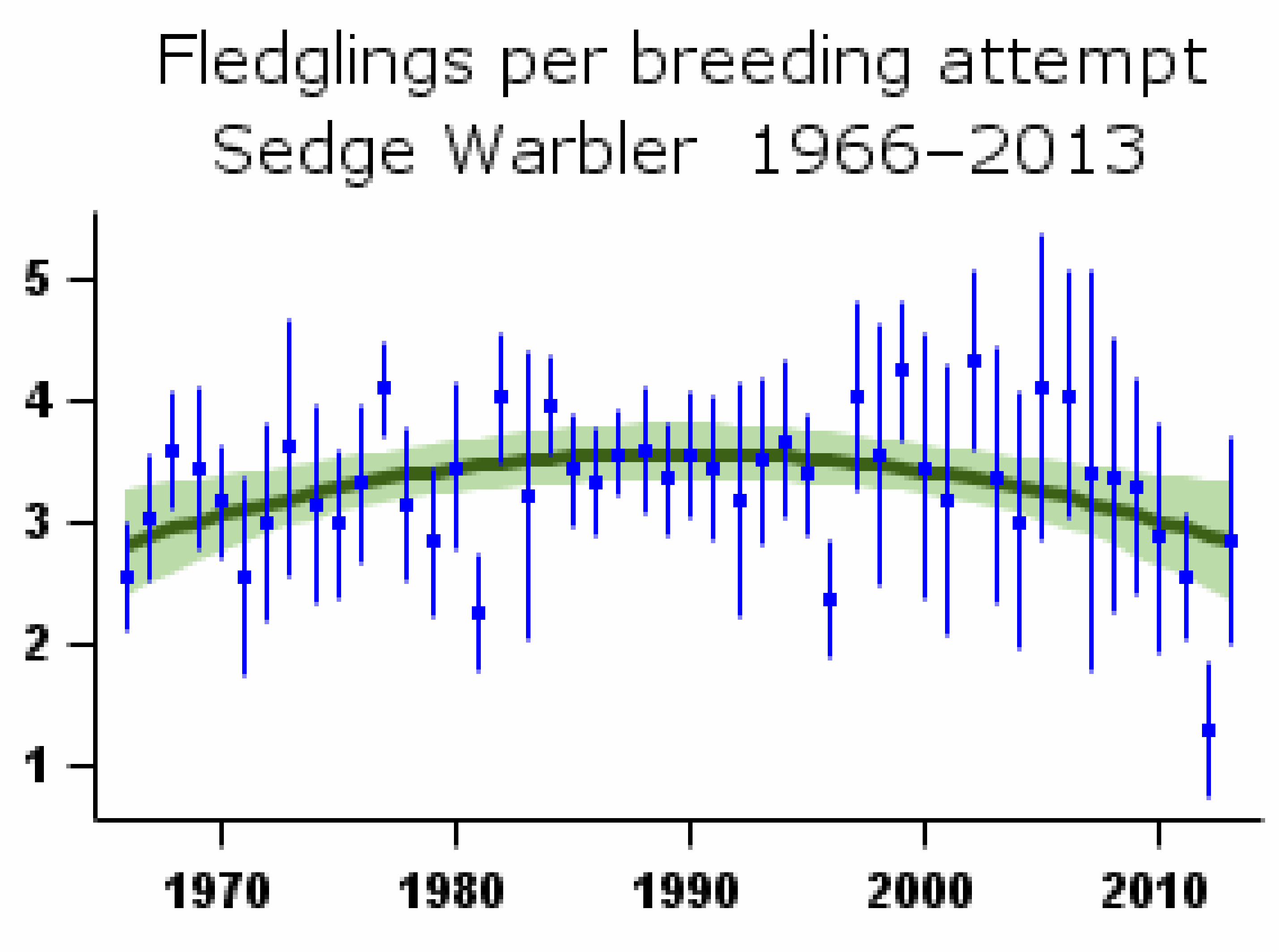


Habitat graph

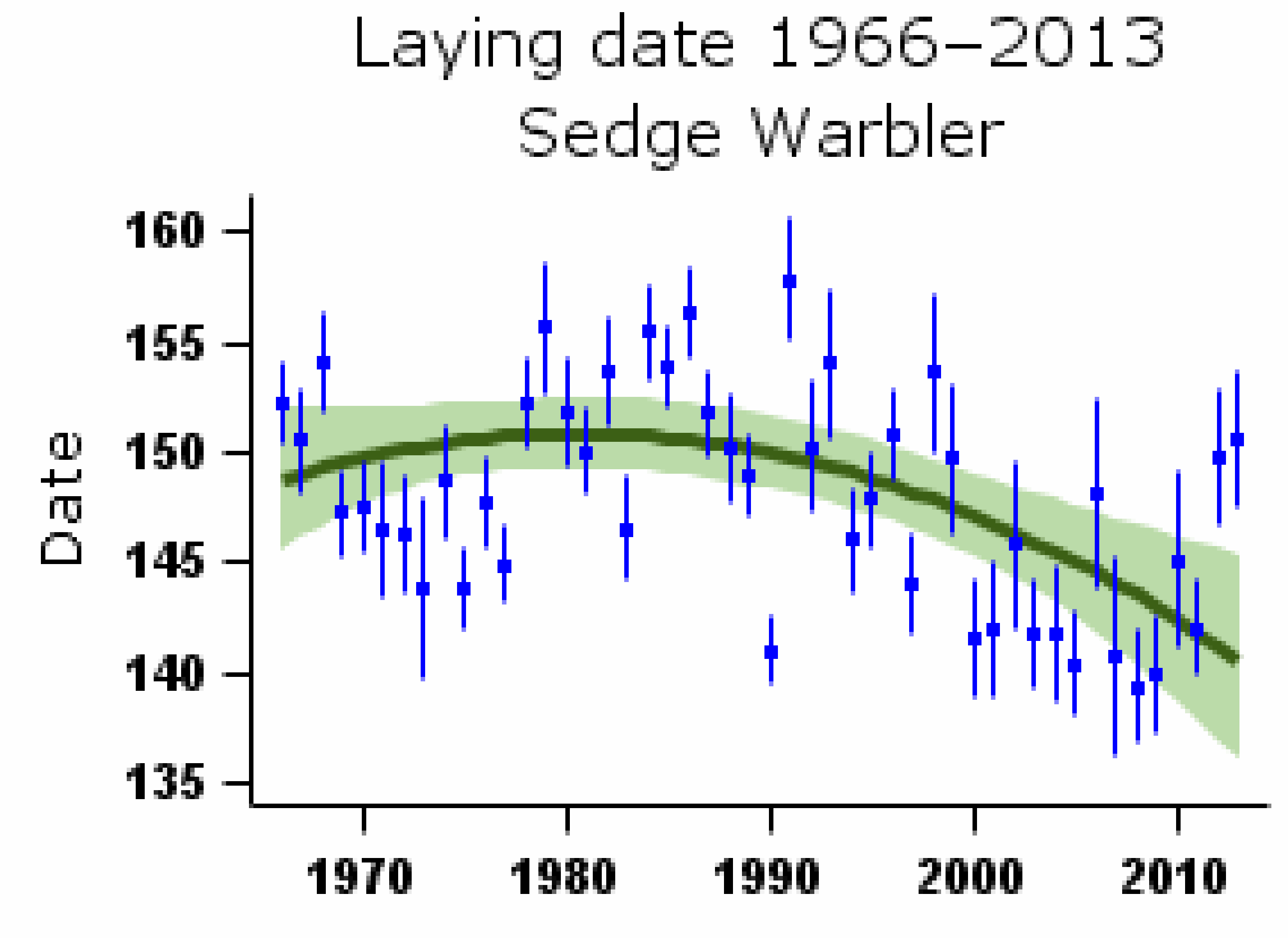


Habitat graph

Demographic trends



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

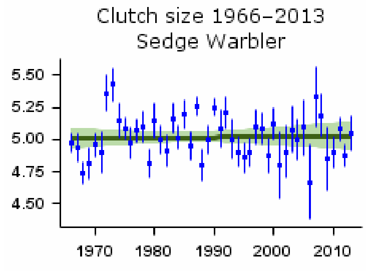


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

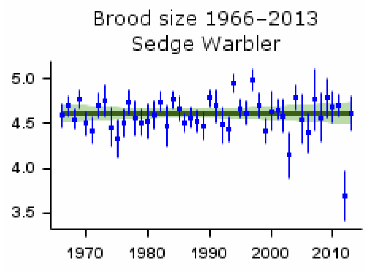
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	39	Curvilinear	2.95 fledglings	2.89 fledglings	-1.8%		
Clutch size	44	1968-2012	34	None					
Brood size	44	1968-2012	54	None					
Nest failure rate at egg stage	44	1968-2012	41	Curvilinear	1.48% nests/day	2.01% nests/day	35.8%		
Nest failure rate at chick stage	44	1968-2012	47	None					
Laying date	44	1968-2012	47	Curvilinear	May 29	May 21	-8 days		
Juvenile to Adult ratio (CES)	28	1984-2012	72	Smoothed trend	255 Index value	100 Index value	-61%	>50	
Juvenile to Adult ratio (CES)	25	1987-2012	78	Smoothed trend	177 Index value	100 Index value	-44%	>25	
Juvenile to Adult ratio (CES)	10	2002-2012	79	Smoothed trend	117 Index value	100 Index value	-15%		
Juvenile to Adult ratio (CES)	5	2007-2012	79	Smoothed trend	119 Index value	100 Index value	-16%		

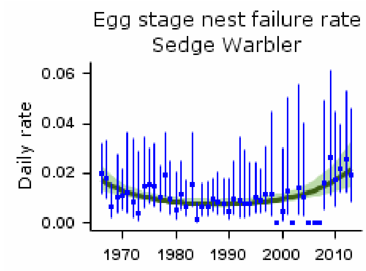
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



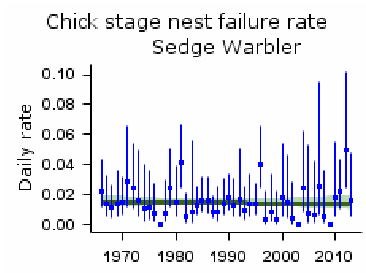
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



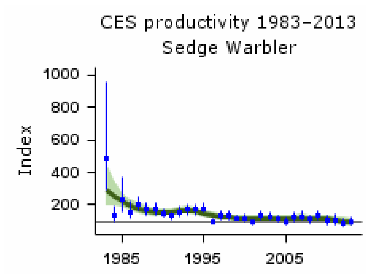
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



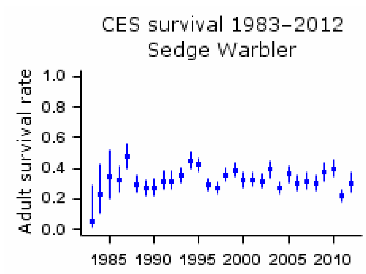
Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Reed Warbler

Acrocephalus scirpaceus

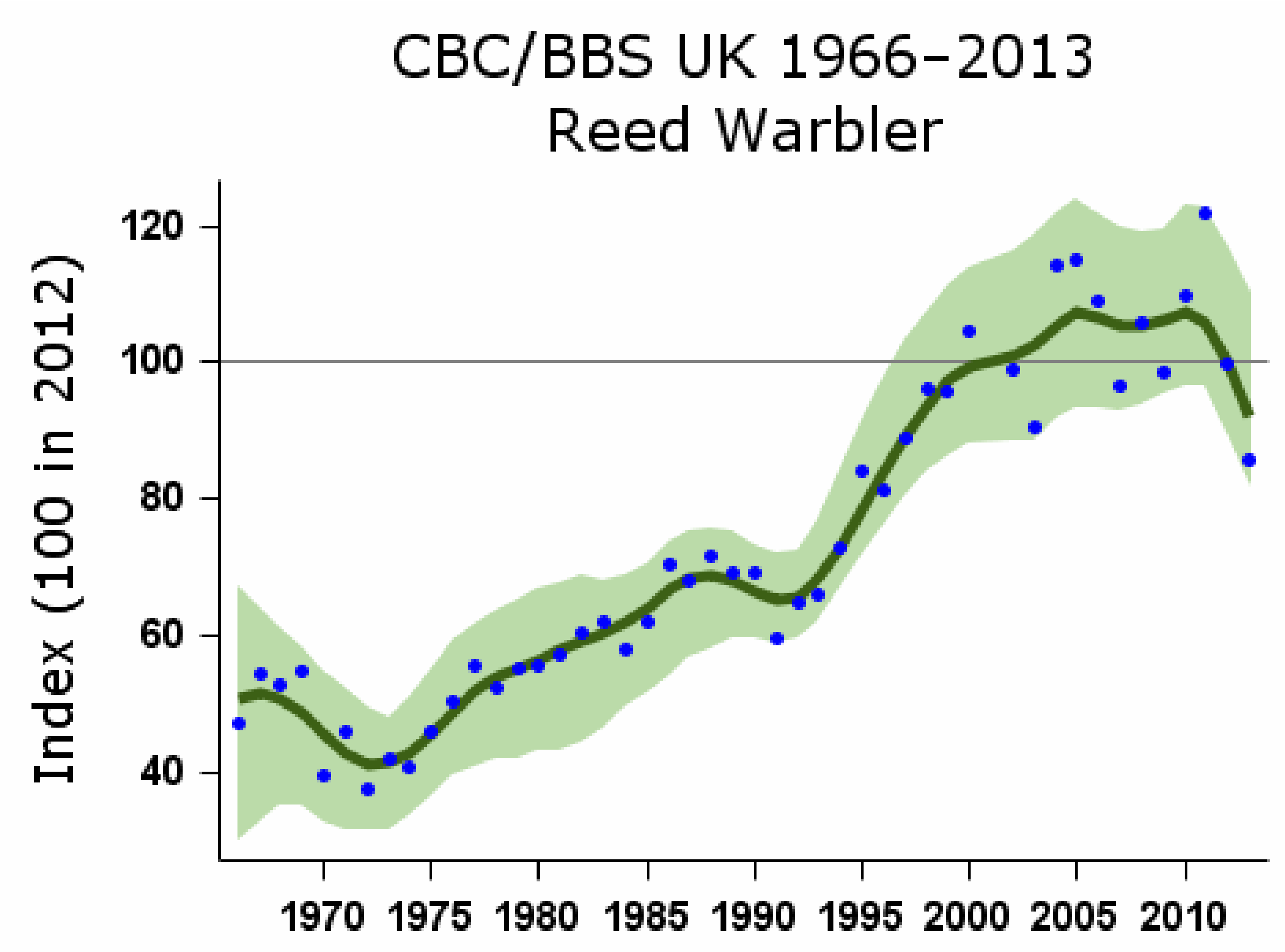
Key facts

Conservation listings:	Europe: no SPEC category (concentrated in Europe, conservation status favourable) (BiE04) UK: green (BoCC3)
Long-term trend:	UK, England: moderate 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 to 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 strong 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, Balmeret al. 2013). There has been little long-term change across Europe since 1980 (PECBMS 2014a).



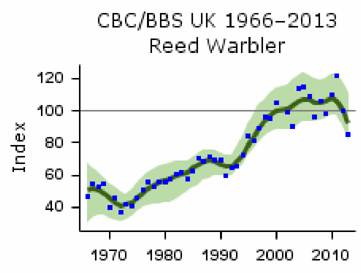
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

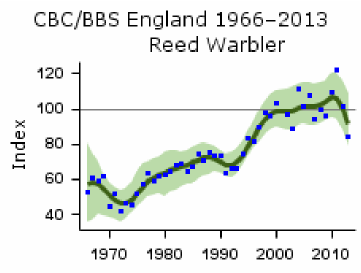
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	45	1967-2012	68	94	37	281		
	25	1987-2012	105	46	18	103		
	10	2002-2012	151	-1	-13	17		
	5	2007-2012	171	-5	-14	9		
CBC/BBS England	45	1967-2012	65	73	19	210		
	25	1987-2012	100	38	10	94		
	10	2002-2012	143	2	-11	18		
	5	2007-2012	161	-1	-9	11		
WBS/WBBS waterways	31	1981-2012	43	78	5	250		
	25	1987-2012	50	70	12	179		
	10	2002-2012	69	-3	-21	14		
	5	2007-2012	60	-3	-14	10		
CES adults	28	1984-2012	56	-31	-46	-10	>25	
	25	1987-2012	60	-25	-41	-5		
	10	2002-2012	62	-12	-23	1		
	5	2007-2012	65	6	-5	19		
CES juveniles	28	1984-2012	58	38	-26	284		
	25	1987-2012	63	16	-25	81		
	10	2002-2012	65	-23	-39	-3		
	5	2007-2012	67	-3	-21	19		
BBS UK	17	1995-2012	130	21	4	51		
	10	2002-2012	151	0	-10	16		
	5	2007-2012	171	-6	-16	8		
BBS England	17	1995-2012	124	21	3	49		
	10	2002-2012	143	3	-11	20		
	5	2007-2012	161	-2	-10	10		

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

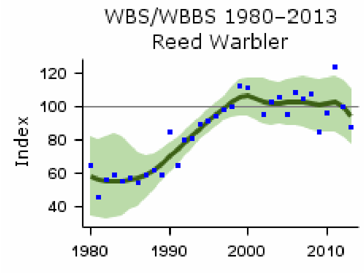
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



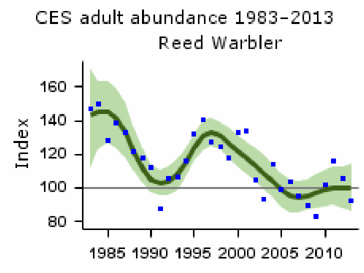
CBC/BBS UK graph



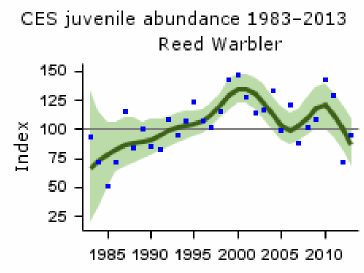
CBC/BBS England graph



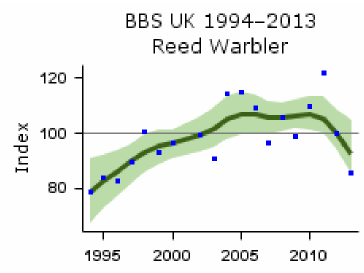
WBS/WBBS waterways graph



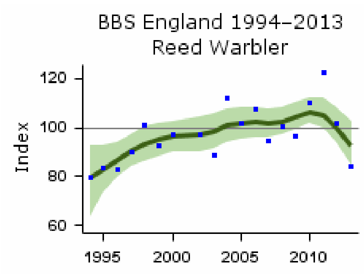
CES adults graph



CES juveniles graph

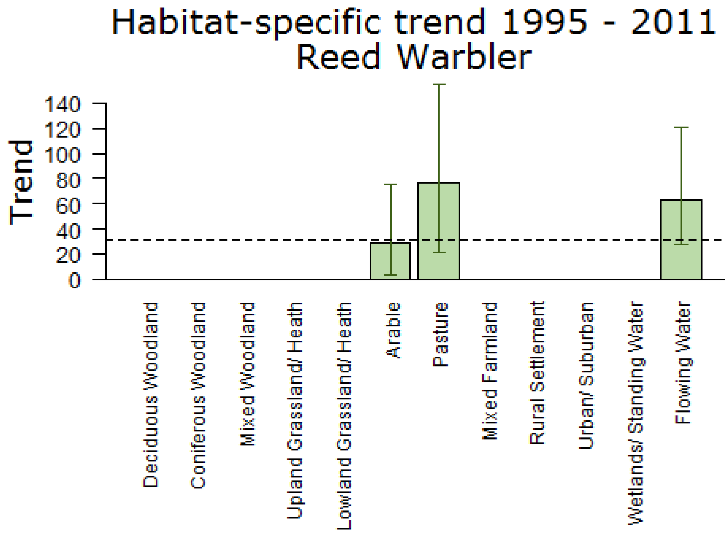


BBS UK graph



BBS England graph

Population trends by habitat



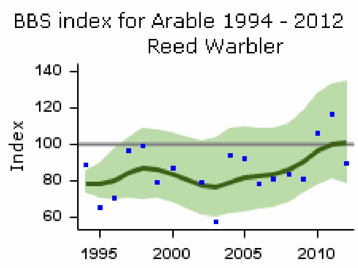
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

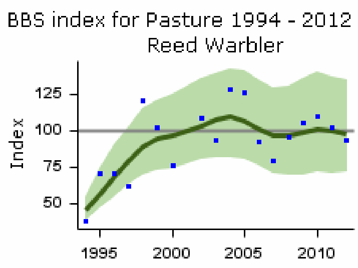
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Arable	16	1995-2011	37	29	3	75
Pasture	16	1995-2011	36	77	21	155
Flowing Water	16	1995-2011	49	63	28	121

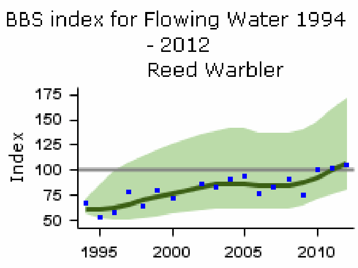
Further information on habitat-specific trends, please follow link here.



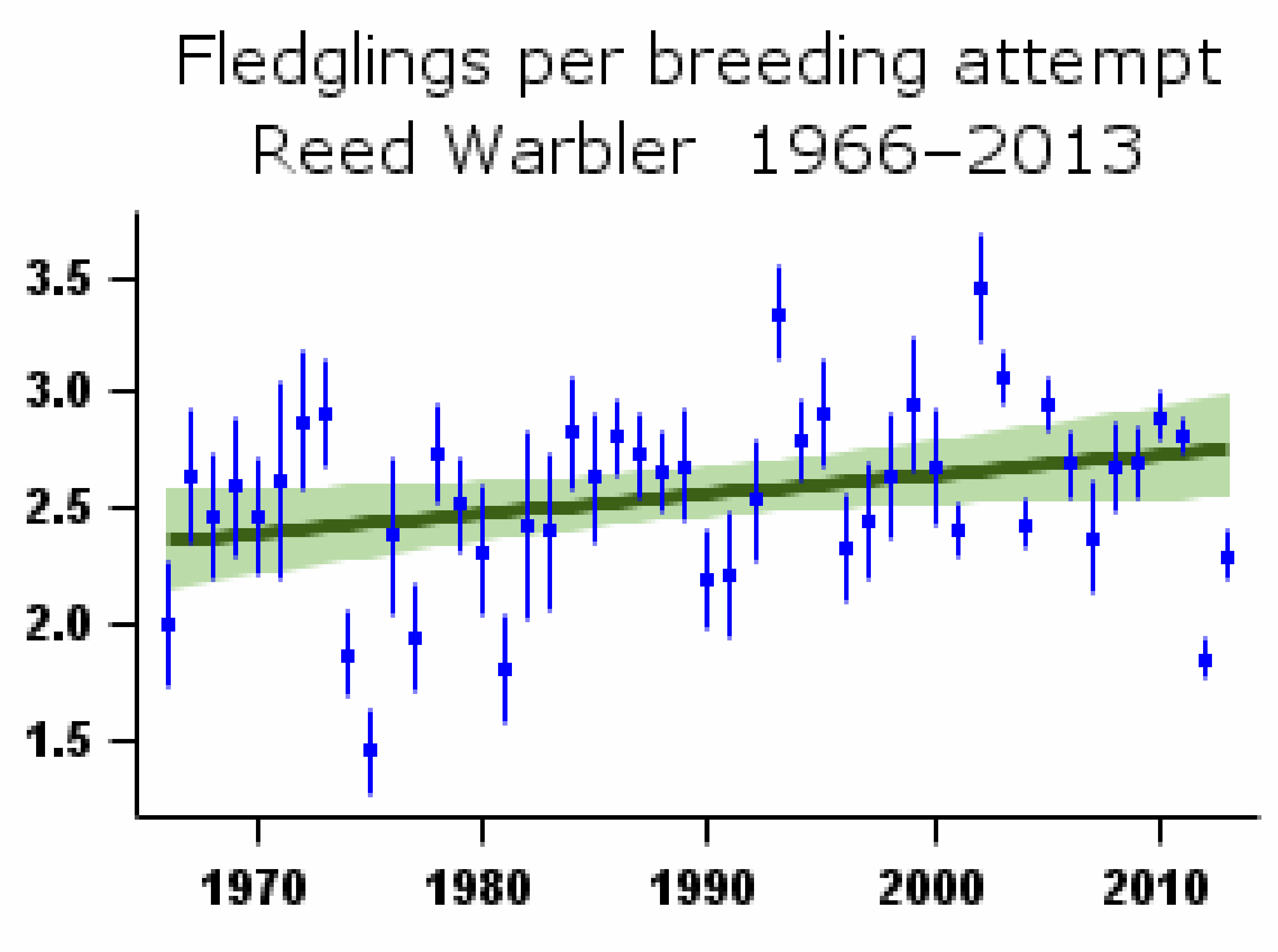
Habitat graph



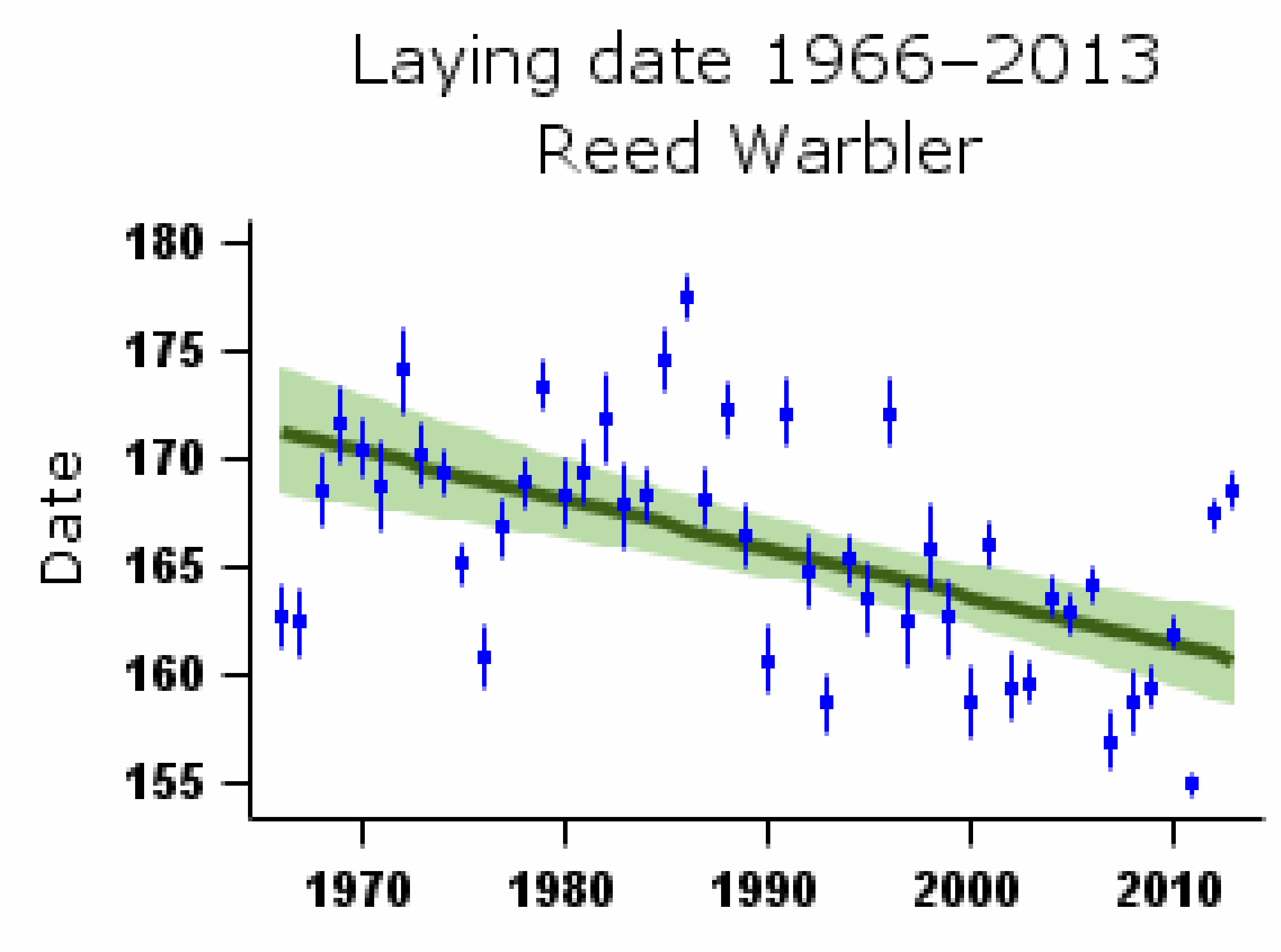
Habitat graph



Demographic trends



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

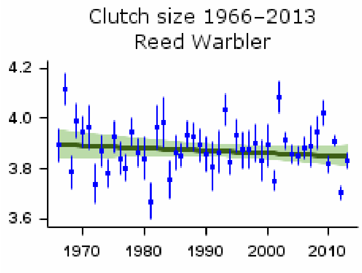


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

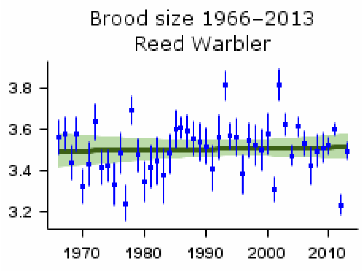
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	146	Linear increase	2.37 fledglings	2.75 fledglings	15.8%		
Clutch size	44	1968-2012	153	None					
Brood size	44	1968-2012	169	None					
Nest failure rate at egg stage	44	1968-2012	190	Curvilinear	1.76% nests/day	1.70% nests/day	-3.4%		
Nest failure rate at chick stage	44	1968-2012	146	Curvilinear	2.15% nests/day	0.94% nests/day	-56.3%		
Laying date	44	1968-2012	216	Linear decline	Jun 20	Jun 10	-10 days		
Juvenile to Adult ratio (CES)	28	1984-2012	63	Smoothed trend	81 Index value	100 Index value	23%		
Juvenile to Adult ratio (CES)	25	1987-2012	67	Smoothed trend	91 Index value	100 Index value	9%		
Juvenile to Adult ratio (CES)	10	2002-2012	69	Smoothed trend	122 Index value	100 Index value	-18%		
Juvenile to Adult ratio (CES)	5	2007-2012	71	Smoothed trend	112 Index value	100 Index value	-10%		

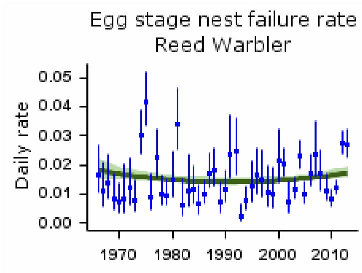
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



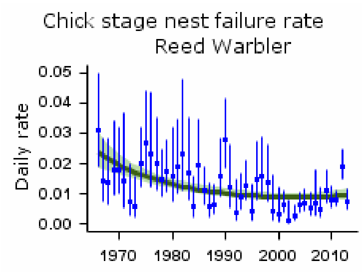
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



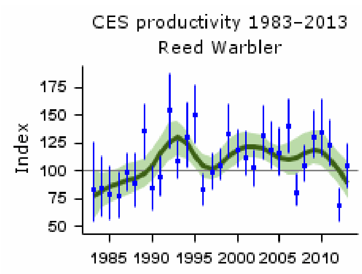
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



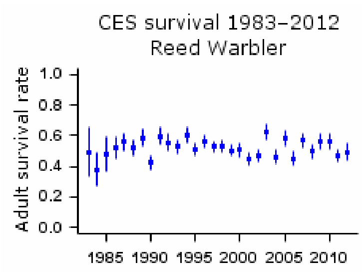
Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



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 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.

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Nuthatch

Sitta europaea

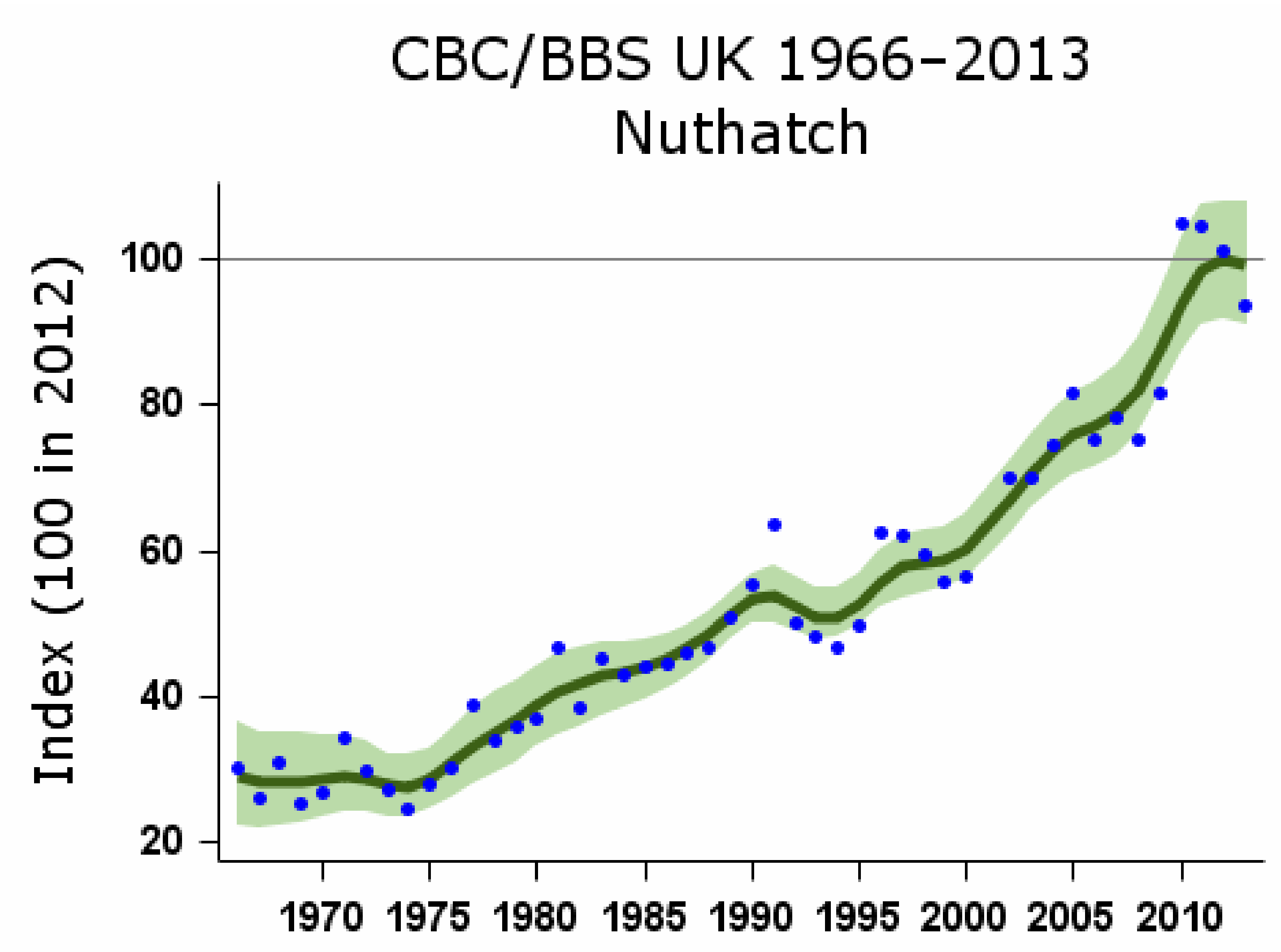
Key facts

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 and southern Scotland (Balmer et al. 2013). The BBS PECBMS 2014a).



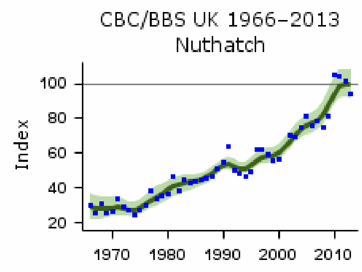
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

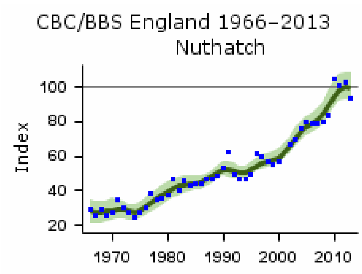
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	45	1967-2012	239	252	151	396		
	25	1987-2012	385	115	87	155		
	10	2002-2012	599	49	38	60		
	5	2007-2012	695	27	20	34		
CBC/BBS England	45	1967-2012	206	260	174	427		
	25	1987-2012	330	115	88	161		
	10	2002-2012	513	52	42	62		
	5	2007-2012	606	23	18	30		
BBS UK	17	1995-2012	493	91	74	111		
	10	2002-2012	599	51	40	61		
	5	2007-2012	695	27	22	34		
BBS England	17	1995-2012	419	92	72	113		
	10	2002-2012	513	51	42	62		
	5	2007-2012	606	23	16	29		
BBS Wales	17	1995-2012	72	44	9	77		
	10	2002-2012	82	3	-15	30		
	5	2007-2012	85	9	-3	27		

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

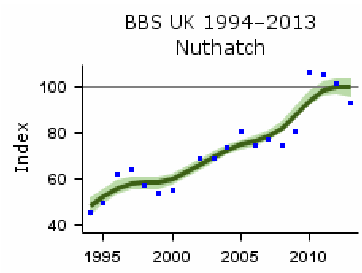
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



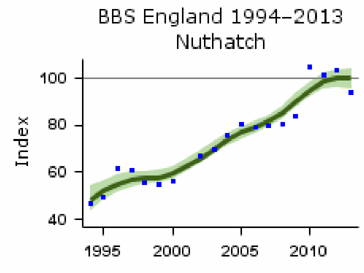
CBC/BBS UK graph



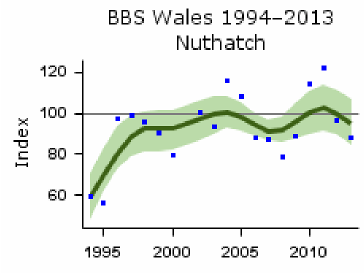
CBC/BBS England graph



BBS UK graph

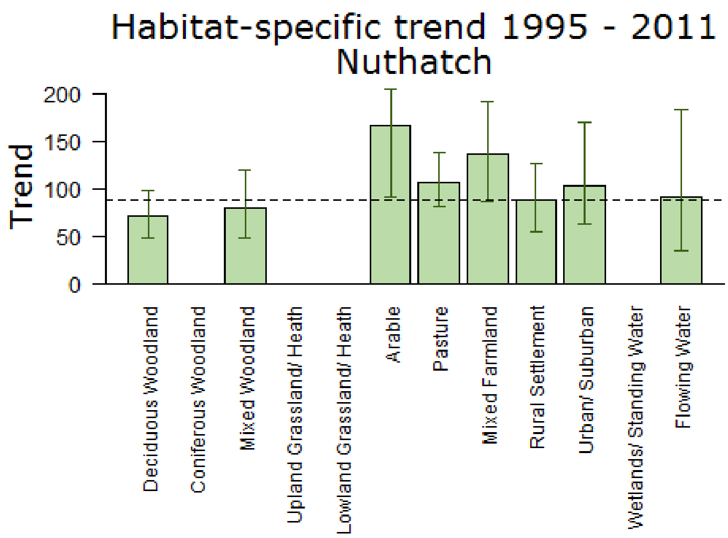


BBS England graph



BBS Wales graph

Population trends by habitat



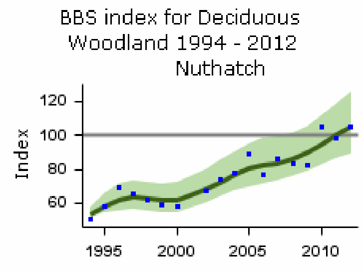
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

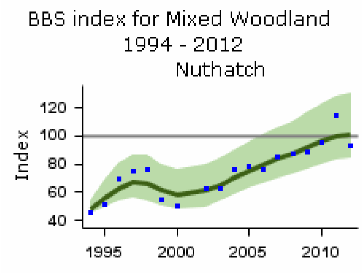
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	202	71	48	99
Mixed Woodland	16	1995-2011	110	79	47	119
Arable	16	1995-2011	59	166	91	204
Pasture	16	1995-2011	203	106	81	137
Mixed Farmland	16	1995-2011	47	136	87	191
Rural Settlement	16	1995-2011	106	87	55	126
Urban/ Suburban	16	1995-2011	45	103	63	170
Flowing Water	16	1995-2011	54	91	35	182

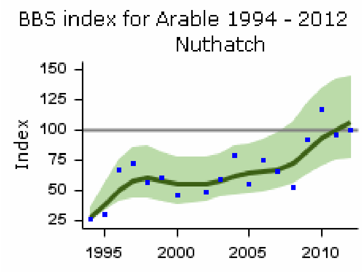
Further information on habitat-specific trends, please follow link here.



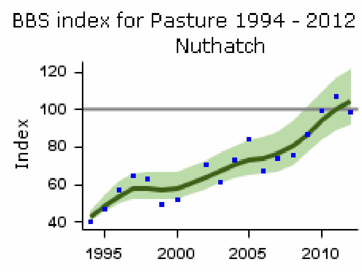
Habitat graph



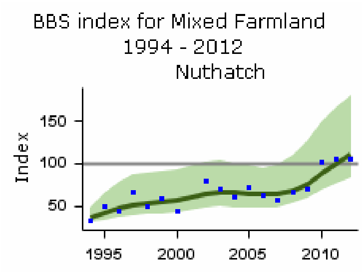
Habitat graph



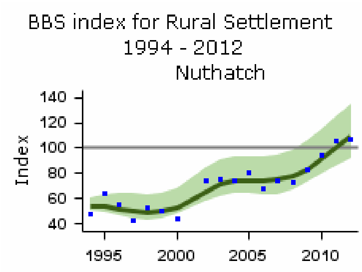
Habitat graph



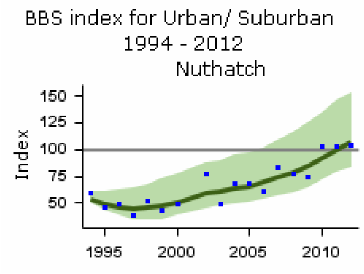
Habitat graph



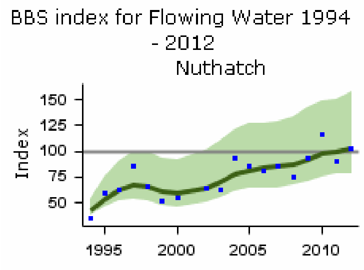
Habitat graph



Habitat graph

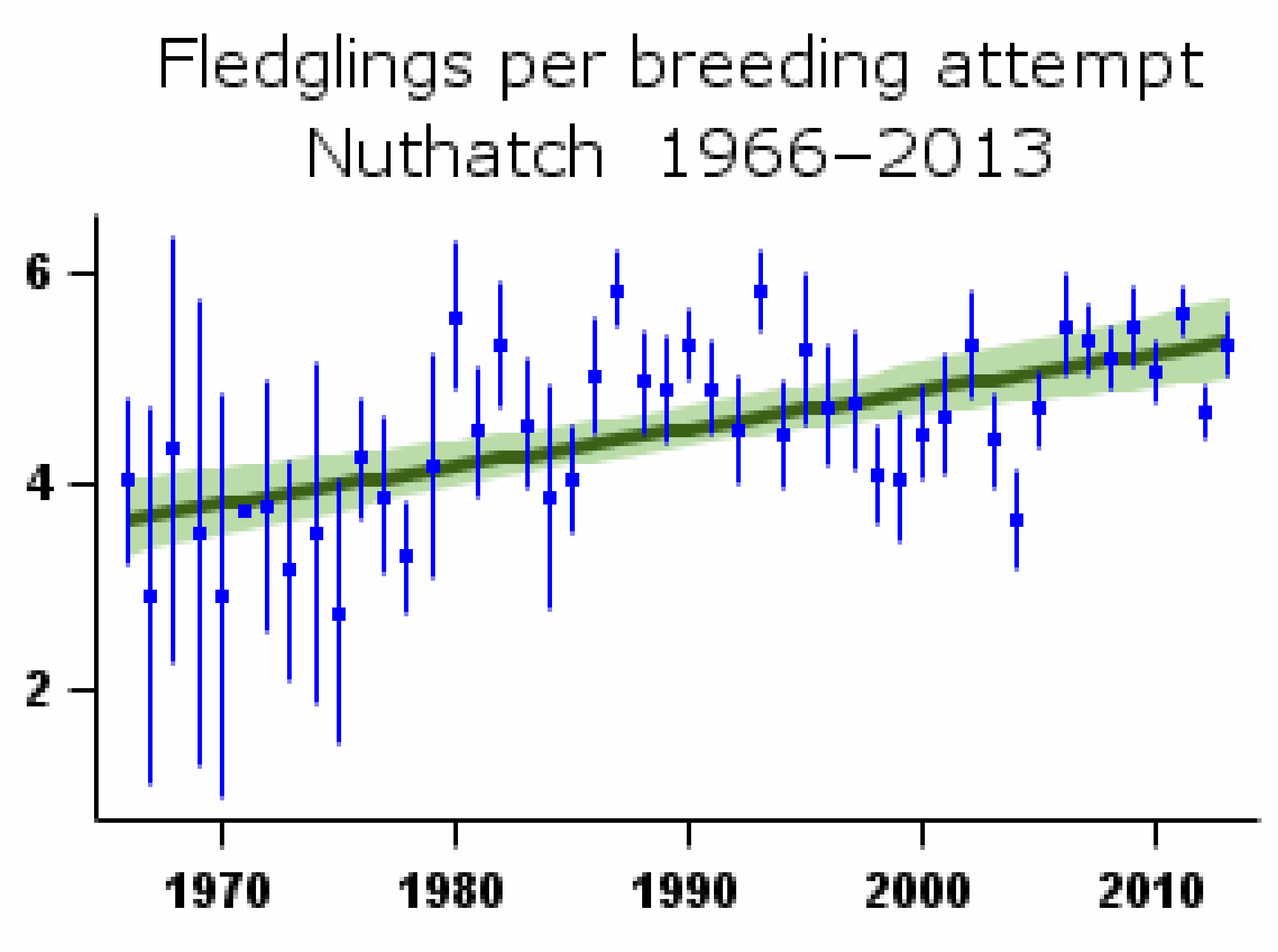


Habitat graph

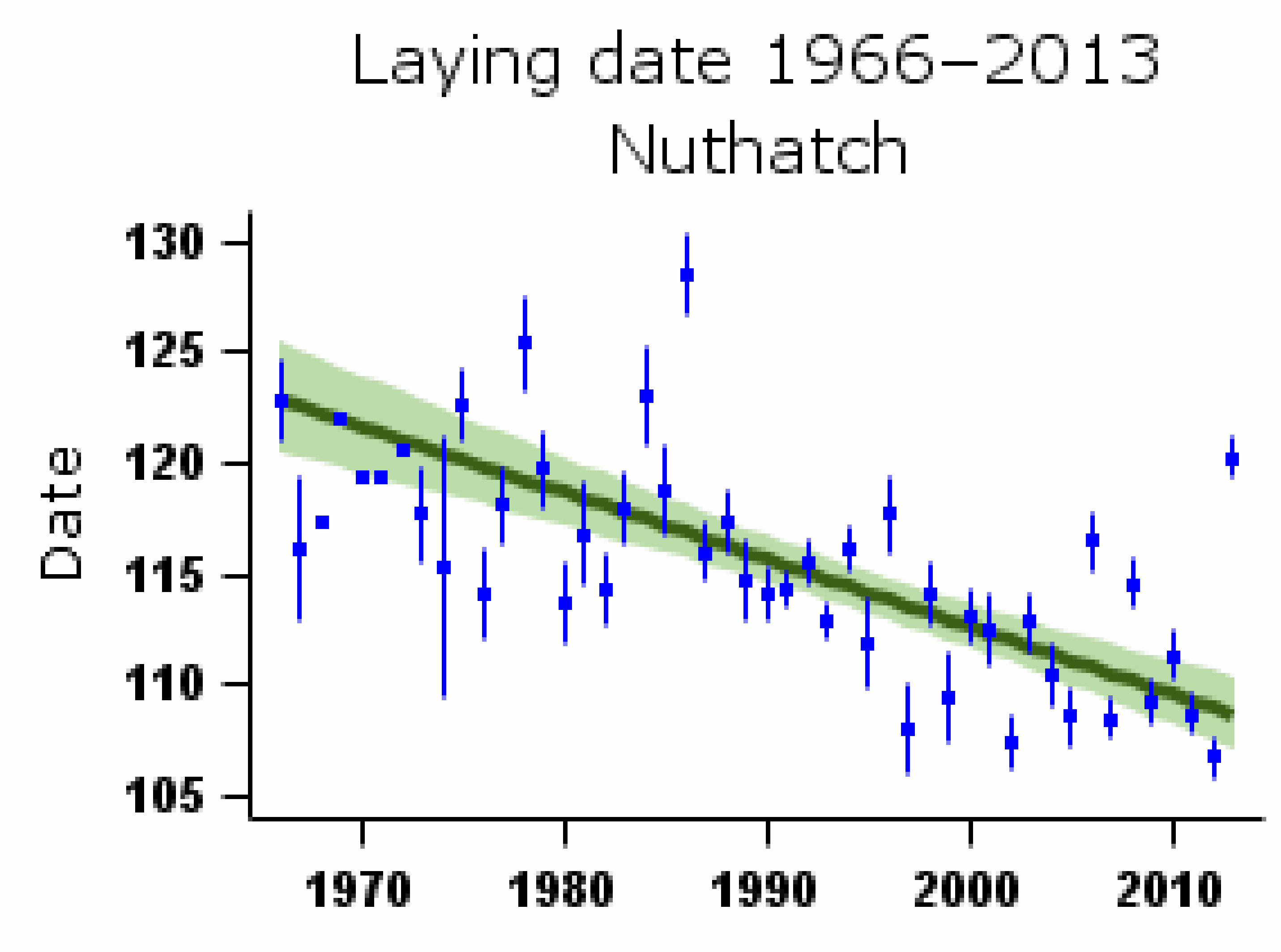


Habitat graph

Demographic trends



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

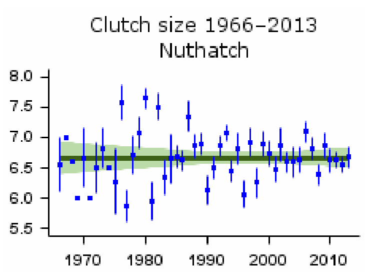


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

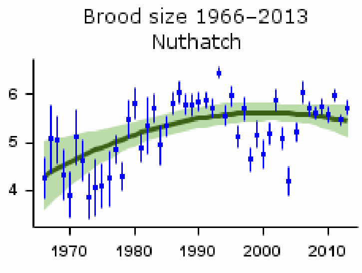
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	55	Linear increase	3.73 fledglings	5.32 fledglings	42.7%		
Clutch size	44	1968-2012	32	None					
Brood size	44	1968-2012	76	Curvilinear	4.45 chicks	5.46 chicks	22.8%		
Nest failure rate at egg stage	44	1968-2012	56	Linear decline	0.84% nests/day	0.23% nests/day	-72.6%		
Nest failure rate at chick stage	44	1968-2012	62	Linear decline	0.43% nests/day	0.21% nests/day	-51.2%		
Laying date	44	1968-2012	32	Linear decline	May 2	Apr 19	-13 days		

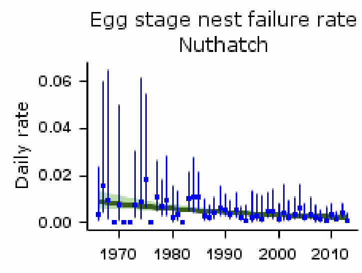
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



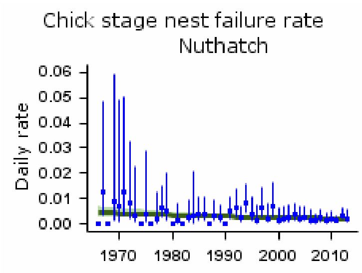
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



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

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

The number of fledglings per breeding attempt has increased strongly, through an increase in brood size and a fall in nest failure rates.

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 less extreme.

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 crop 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 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 poorer performance of Nuthatches in Wales are unknown.

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Treecreeper

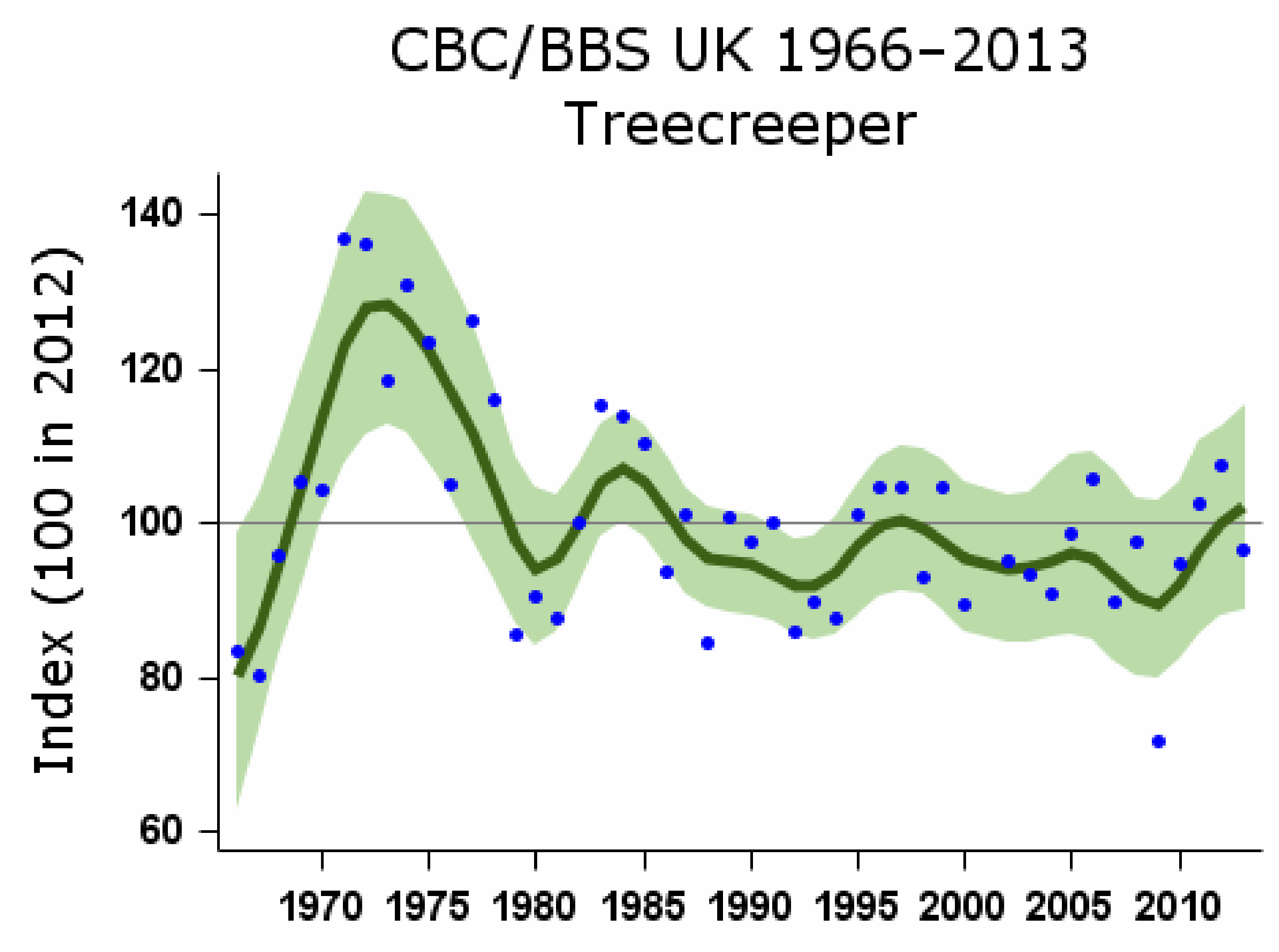
Certhia familiaris

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. There has been a significant fall in nest failure rates at the egg stage and a small increase in overall nest success. 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 (PECBMS 2014a).



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

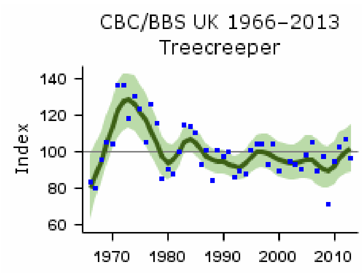
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	45	1967-2012	213	15	-12	59		
	25	1987-2012	305	2	-15	23		
	10	2002-2012	393	6	-6	20		
	5	2007-2012	437	7	-1	15		

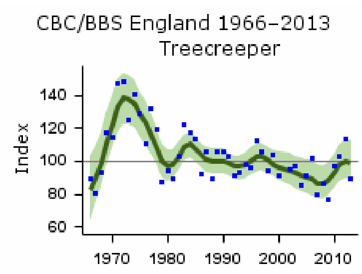
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	45	1967-2012	166	12	-18	50		
	25	1987-2012	234	-1	-15	17		
	10	2002-2012	296	7	-3	18		
	5	2007-2012	332	15	5	27		
CES adults	28	1984-2012	38	28	-12	90		
	25	1987-2012	40	56	19	117		
	10	2002-2012	39	18	-1	42		
	5	2007-2012	36	-6	-23	19		
CES juveniles	28	1984-2012	62	27	-11	103		
	25	1987-2012	66	37	3	113		
	10	2002-2012	69	-22	-36	-4		
	5	2007-2012	66	1	-14	19		
BBS UK	17	1995-2012	353	6	-8	17		
	10	2002-2012	393	7	-6	18		
	5	2007-2012	437	8	0	16		
BBS England	17	1995-2012	264	0	-12	14		
	10	2002-2012	296	6	-3	18		
	5	2007-2012	332	14	6	23		
BBS Scotland	17	1995-2012	37	1	-32	32		
	10	2002-2012	42	24	-24	64		
	5	2007-2012	51	-12	-26	5		
BBS Wales	17	1995-2012	40	10	-23	44		
	10	2002-2012	42	-25	-41	-4		
	5	2007-2012	41	2	-15	22		

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

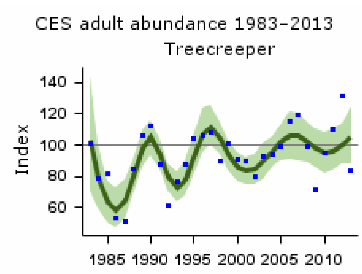
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



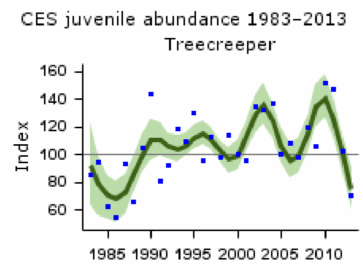
CBC/BBS UK graph



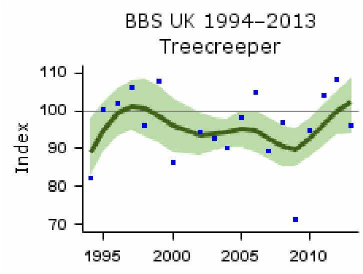
CBC/BBS England graph



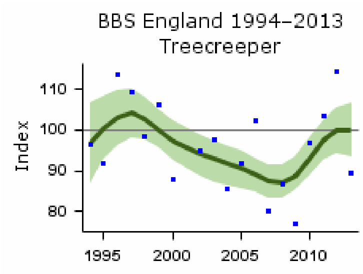
CES adults graph



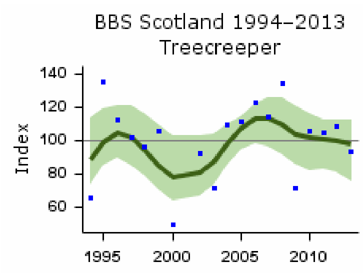
CES juveniles graph



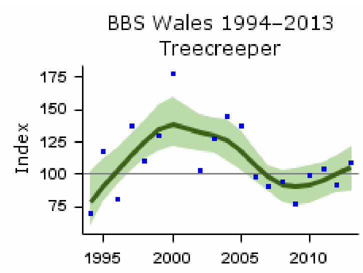
BBS UK graph



BBS England graph

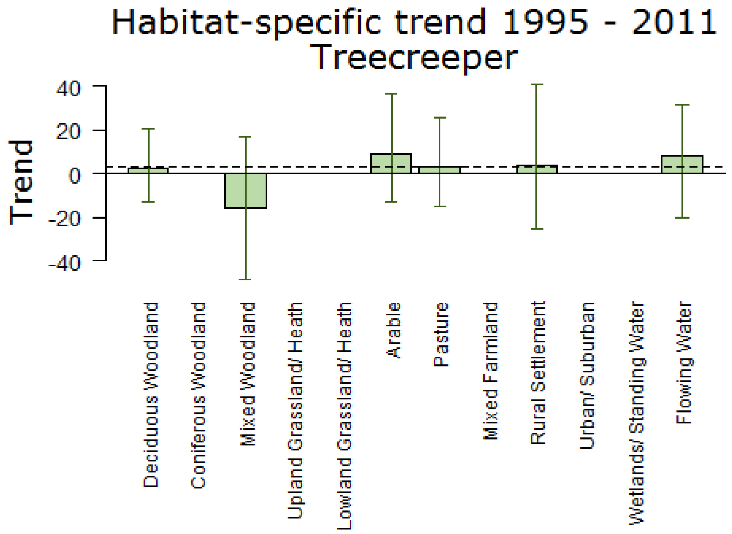


BBS Scotland graph



BBS Wales graph

Population trends by habitat



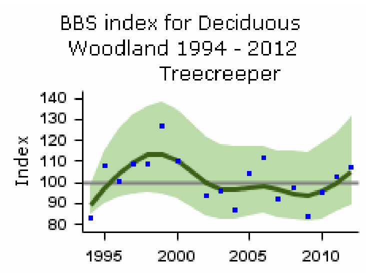
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

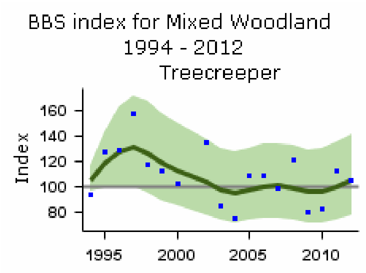
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	126	3	-13	21
Mixed Woodland	16	1995-2011	78	-16	-49	17
Arable	16	1995-2011	47	9	-13	37
Pasture	16	1995-2011	119	3	-15	26
Rural Settlement	16	1995-2011	39	4	-26	41
Flowing Water	16	1995-2011	50	8	-20	31

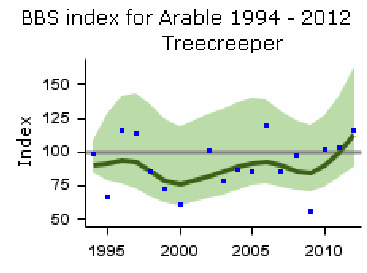
Further information on habitat-specific trends, please follow link here.



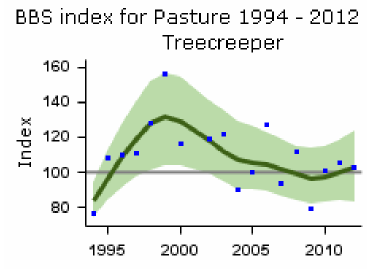
Habitat graph



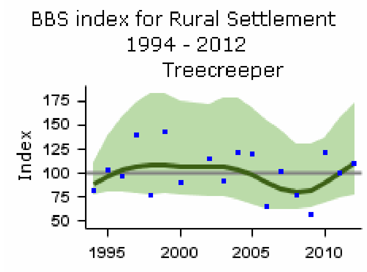
Habitat graph



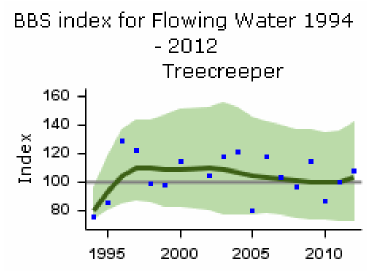
Habitat graph



Habitat graph

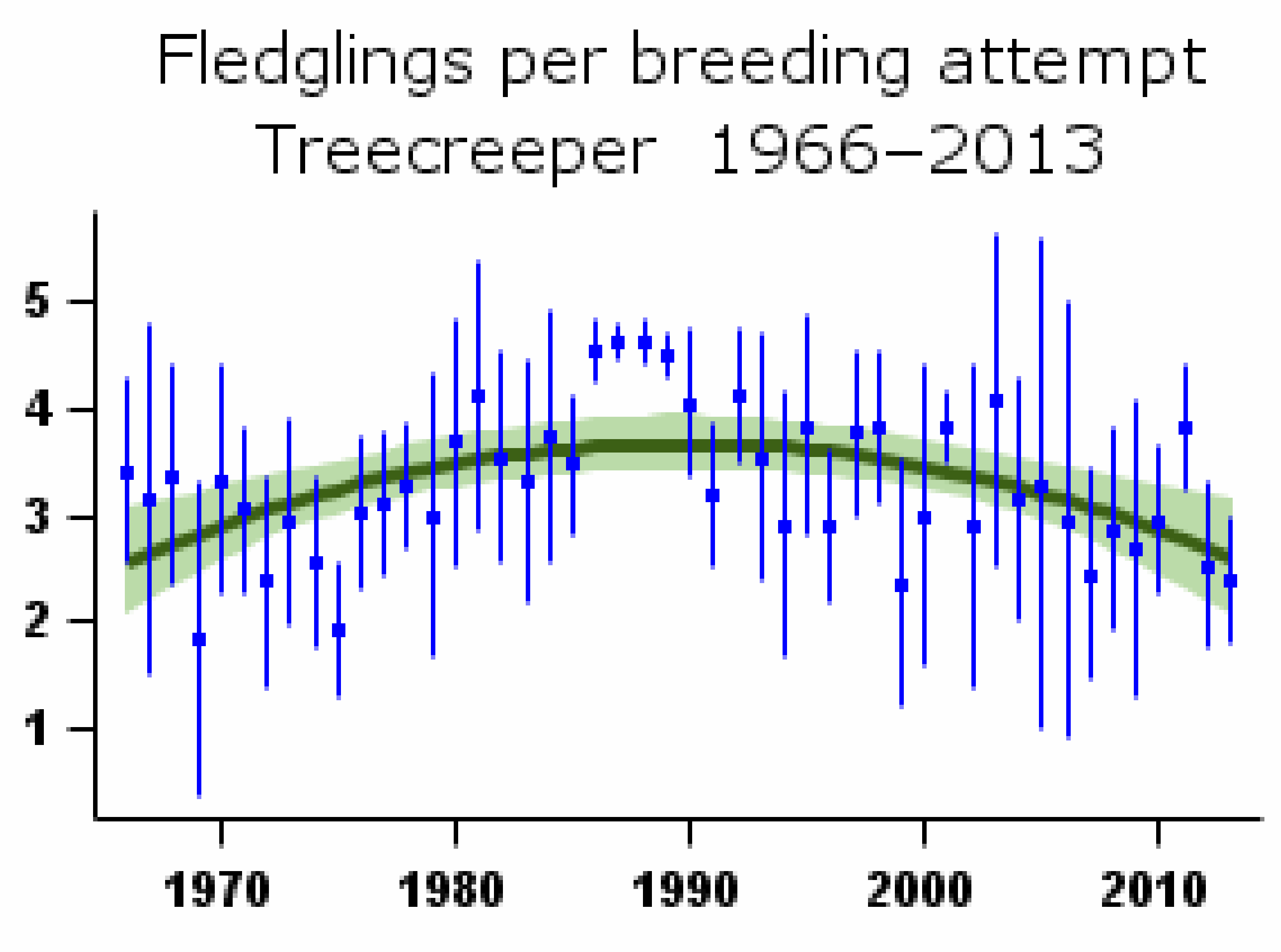


Habitat graph

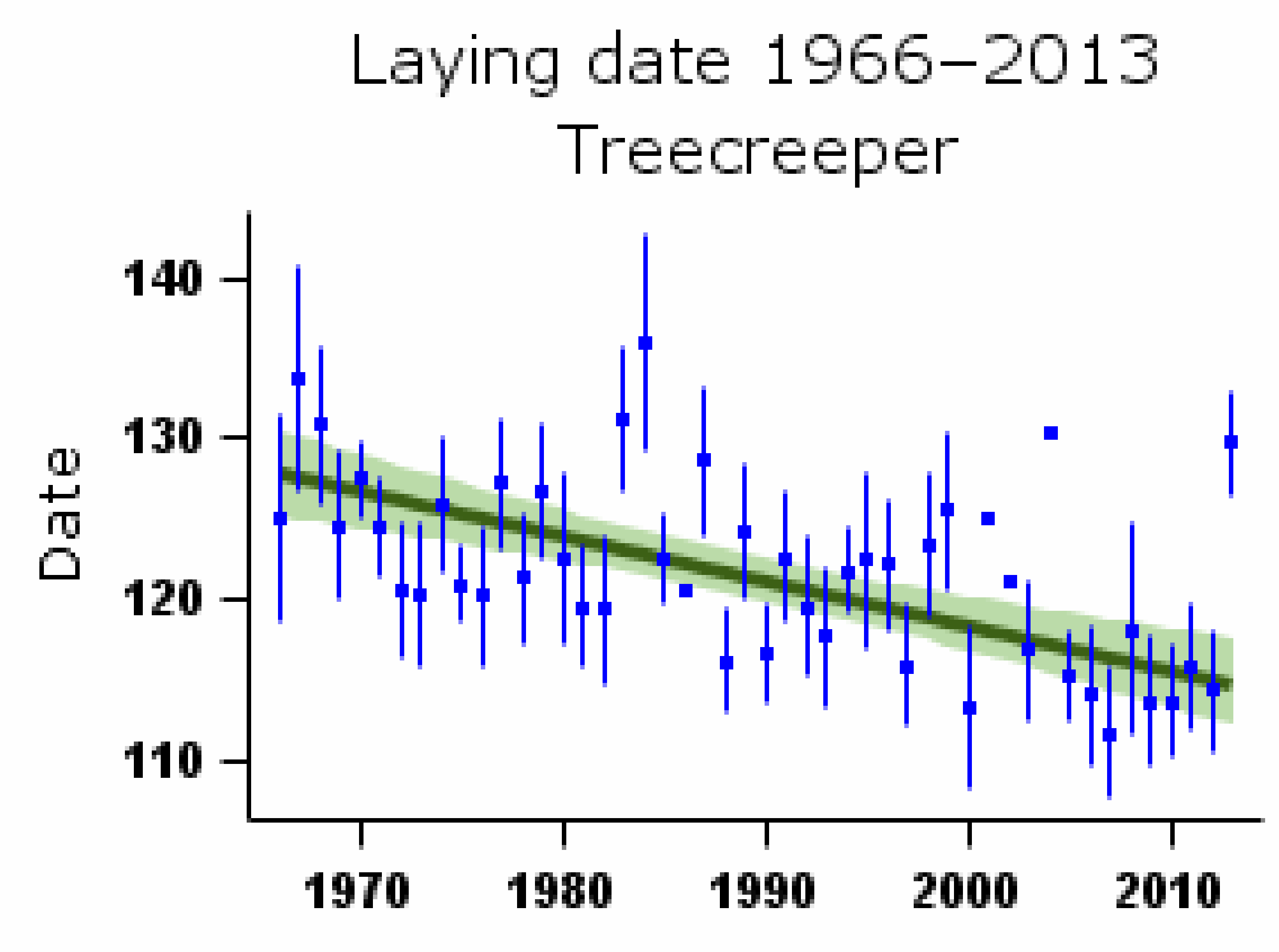


Habitat graph

Demographic trends



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

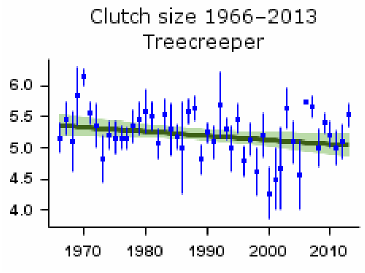


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

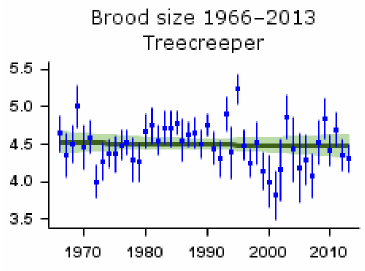
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	20	Curvilinear	2.74 fledglings	2.69 fledglings	-2.1%		
Clutch size	44	1968-2012	14	None					Small sample
Brood size	44	1968-2012	28	None					Small sample
Nest failure rate at egg stage	44	1968-2012	22	Curvilinear	2.32% nests/day	1.98% nests/day	-14.7%		Small sample
Nest failure rate at chick stage	44	1968-2012	22	None					Small sample
Laying date	44	1968-2012	13	Linear decline	May 7	Apr 25	-12 days		Small sample
Juvenile to Adult ratio (CES)	28	1984-2012	69	Smoothed trend	95 Index value	100 Index value	5%		
Juvenile to Adult ratio (CES)	25	1987-2012	74	Smoothed trend	112 Index value	100 Index value	-11%		
Juvenile to Adult ratio (CES)	10	2002-2012	76	Smoothed trend	142 Index value	100 Index value	-29%	>25	
Juvenile to Adult ratio (CES)	5	2007-2012	73	Smoothed trend	67 Index value	100 Index value	50%		

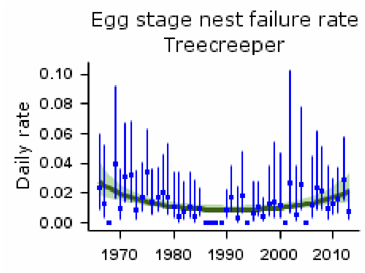
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



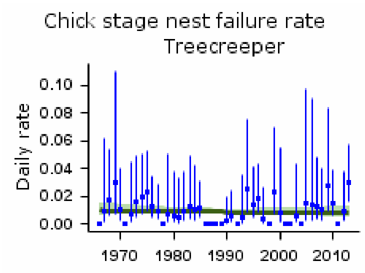
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



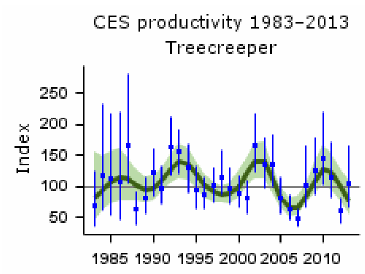
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Wren

Troglodytes troglodytes

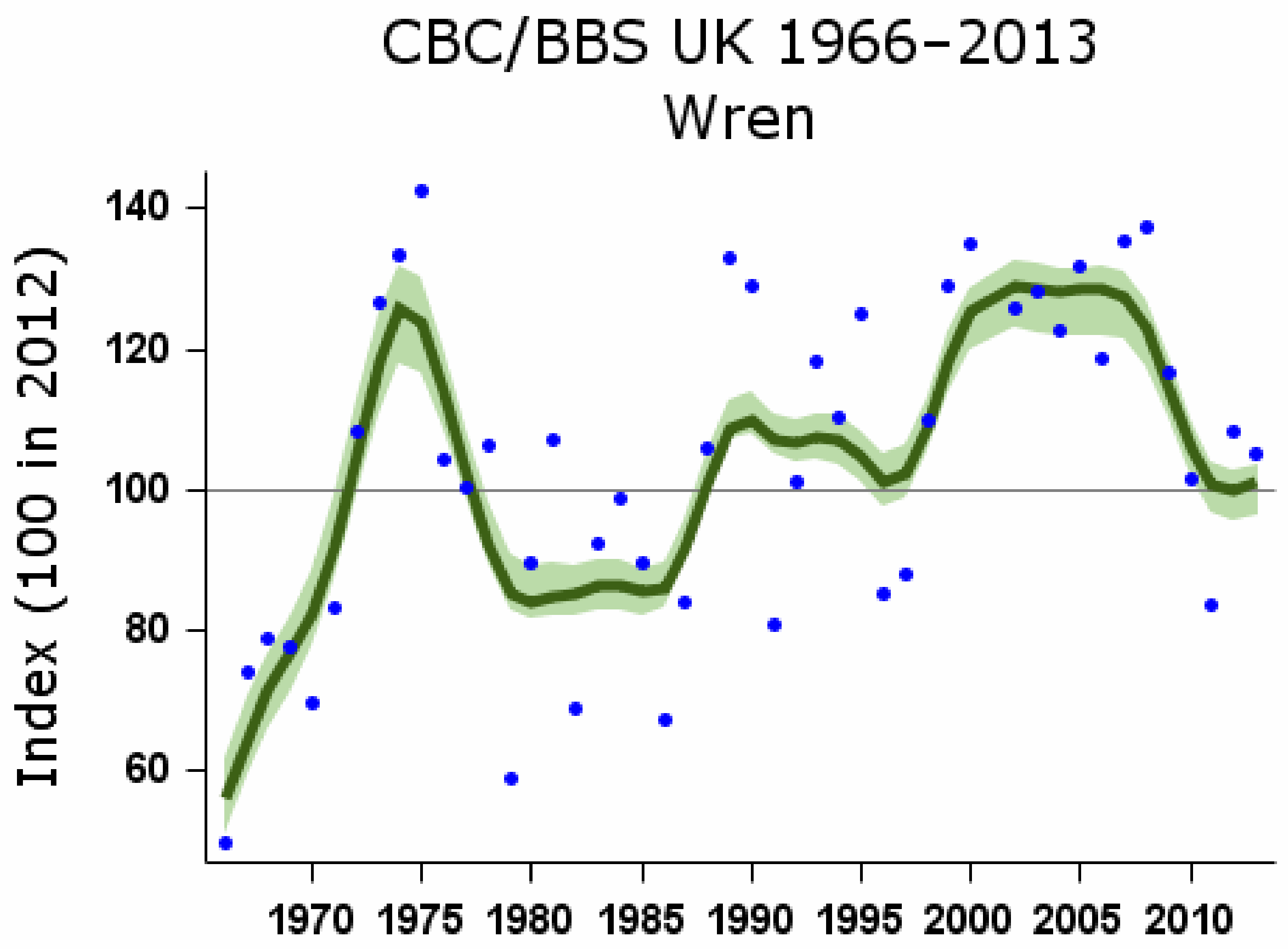
Key facts

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); an RBBP species (Fair Isle and St Kilda only) 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 and, on the latest figures, one in ten of our breeding birds is a Wren (APEP13). Abundance can vary sharply from year to year, however. 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. Following recent severe winters, numbers are somewhat depleted once more, especially in Scotland and Northern Ireland. The BBS PECBMS 2014a).



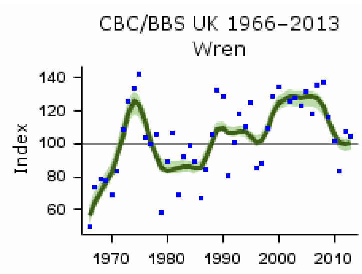
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

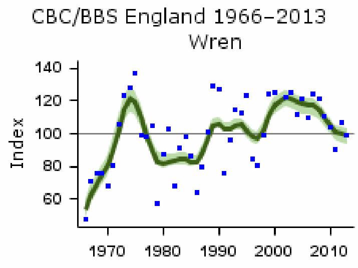
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	45	1967-2012	1127	55	35	71		Small CBC sample
	25	1987-2012	1849	9	1	14		Small CBC sample
	10	2002-2012	2794	-23	-25	-20		
	5	2007-2012	3105	-22	-24	-20		
CBC/BBS England	45	1967-2012	897	61	38	83		Small CBC sample
	25	1987-2012	1461	14	4	18		Small CBC sample
	10	2002-2012	2201	-19	-21	-16		
	5	2007-2012	2477	-15	-17	-13		
CES adults	28	1984-2012	100	25	8	50		
	25	1987-2012	106	14	0	32		
	10	2002-2012	109	-19	-25	-13		
	5	2007-2012	107	-17	-23	-10		
CES juveniles	28	1984-2012	99	20	-12	59		
	25	1987-2012	106	5	-17	35		
	10	2002-2012	109	-21	-31	-11		
	5	2007-2012	108	-13	-21	-3		
BBS UK	17	1995-2012	2468	-3	-7	-1		
	10	2002-2012	2794	-22	-23	-19		
	5	2007-2012	3105	-21	-22	-19		
BBS England	17	1995-2012	1938	-4	-8	-2		
	10	2002-2012	2201	-18	-20	-16		
	5	2007-2012	2477	-14	-16	-13		
BBS Scotland	17	1995-2012	225	1	-12	14		
	10	2002-2012	247	-33	-38	-24	>25	
	5	2007-2012	280	-40	-45	-34	>25	
BBS Wales	17	1995-2012	197	-14	-27	0		
	10	2002-2012	221	-28	-33	-19	>25	
	5	2007-2012	218	-18	-23	-11		
BBS N.Ireland	17	1995-2012	92	13	-11	42		
	10	2002-2012	108	-32	-38	-22	>25	
	5	2007-2012	112	-33	-37	-26	>25	

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

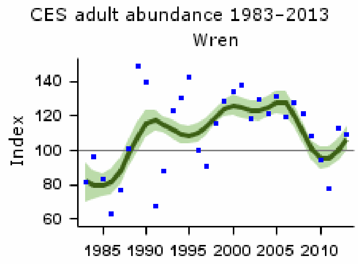
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



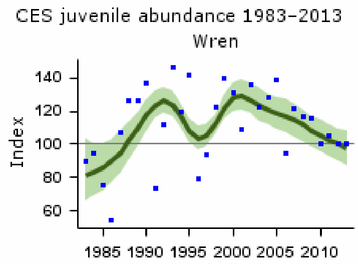
CBC/BBS UK graph



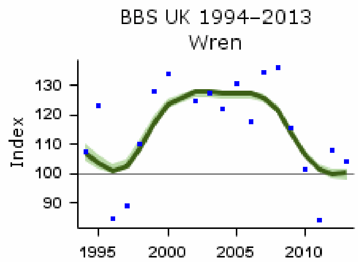
CBC/BBS England graph



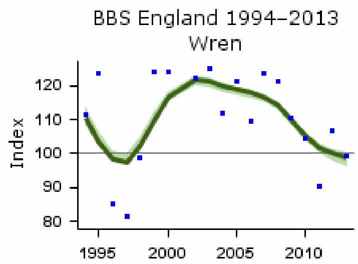
CES adults graph



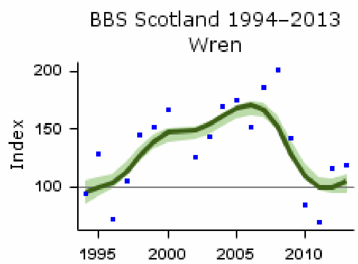
CES juveniles graph



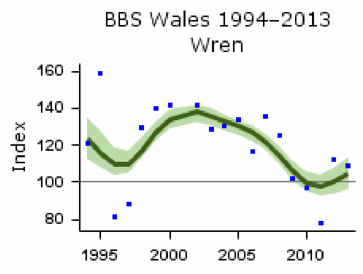
BBS UK graph



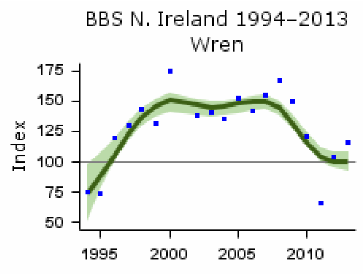
BBS England graph



BBS Scotland graph

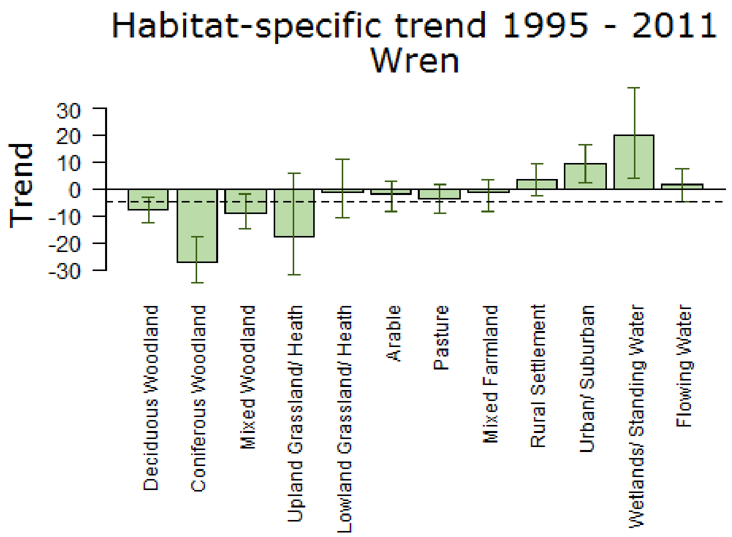


BBS Wales graph



BBS N.Ireland graph

Population trends by habitat



Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

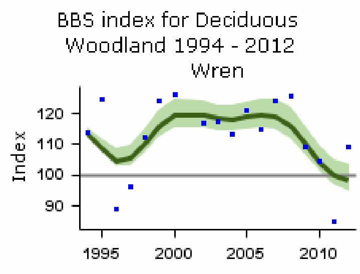
Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

More on habitat trends

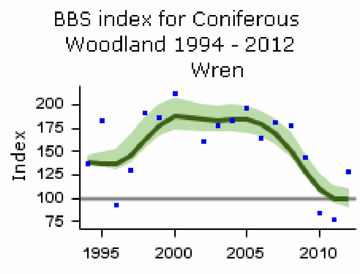
Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	920	-8	-12	-3
Coniferous Woodland	16	1995-2011	247	-27	-35	-18
Mixed Woodland	16	1995-2011	493	-9	-15	-2
Upland Grassland/ Heath	16	1995-2011	73	-18	-32	6
Lowland Grassland/ Heath	16	1995-2011	205	-1	-11	11
Arable	16	1995-2011	773	-2	-8	3
Pasture	16	1995-2011	1324	-4	-9	2
Mixed Farmland	16	1995-2011	717	-1	-8	3
Rural Settlement	16	1995-2011	875	4	-3	9
Urban/ Suburban	16	1995-2011	403	9	2	16

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Wetlands/ Standing Water	16	1995-2011	113	20	4	38
Flowing Water	16	1995-2011	583	1	-5	8

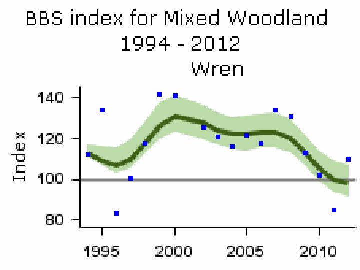
Further information on habitat-specific trends, please follow link here.



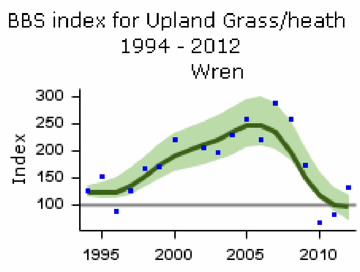
Habitat graph



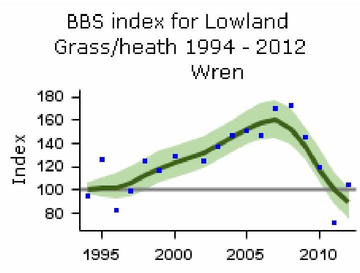
Habitat graph



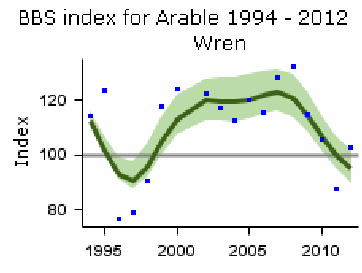
Habitat graph



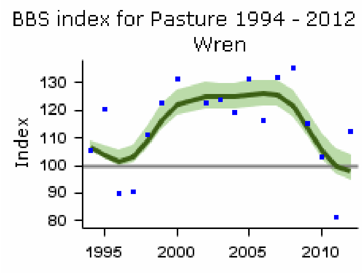
Habitat graph



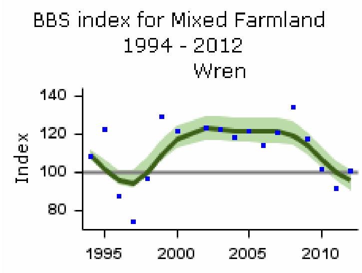
Habitat graph



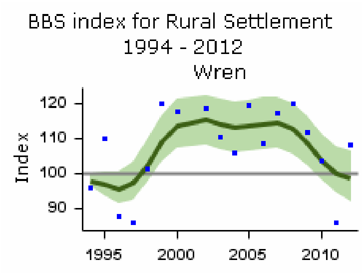
Habitat graph



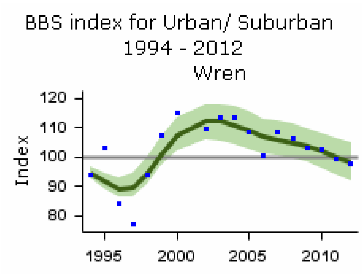
Habitat graph



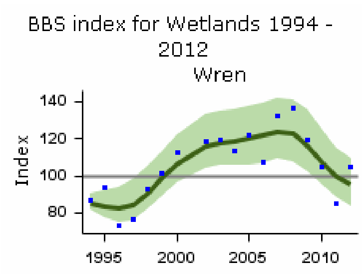
Habitat graph



Habitat graph



Habitat graph



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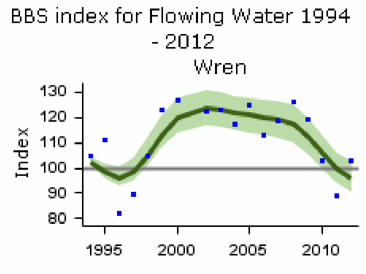
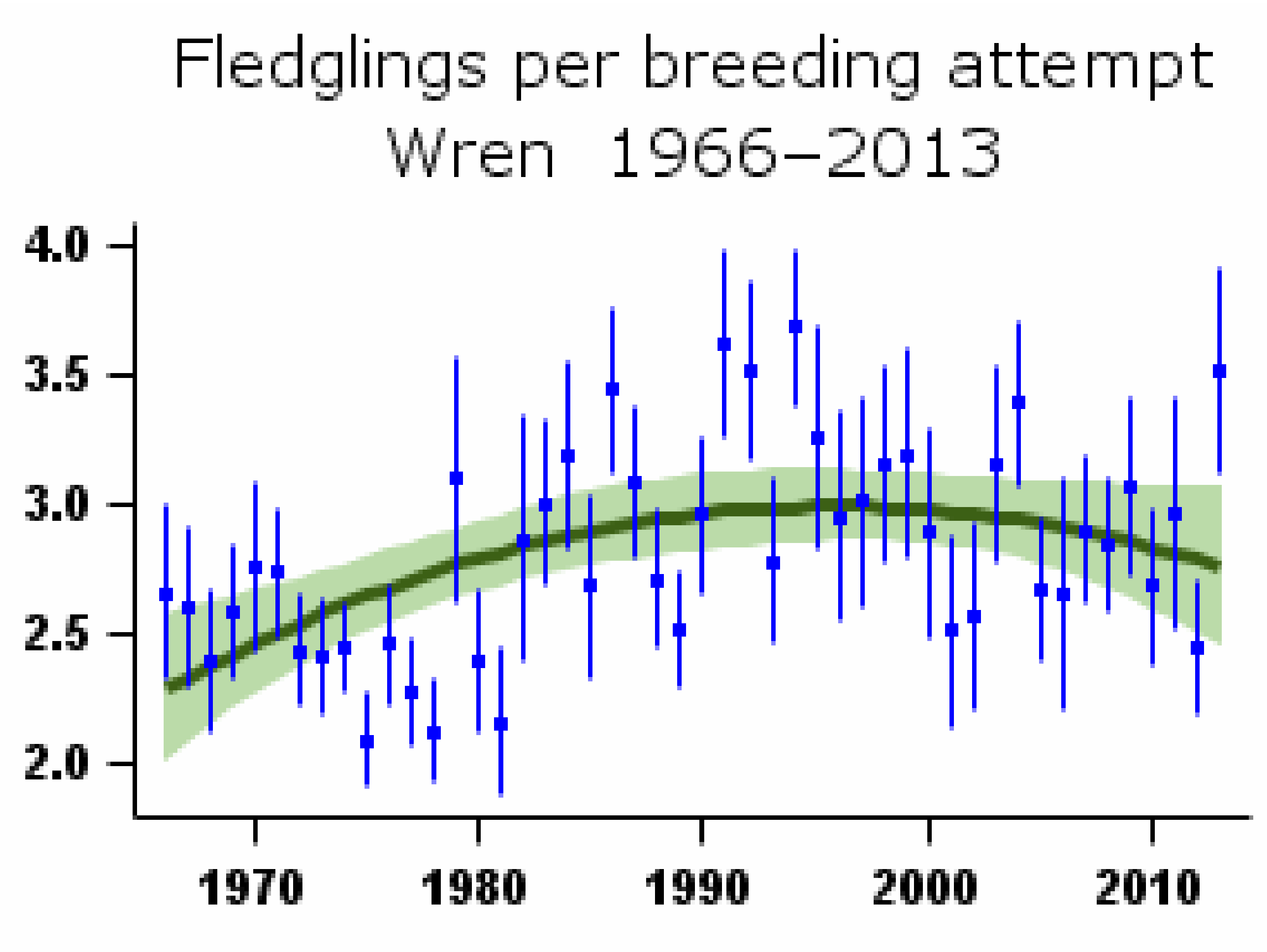
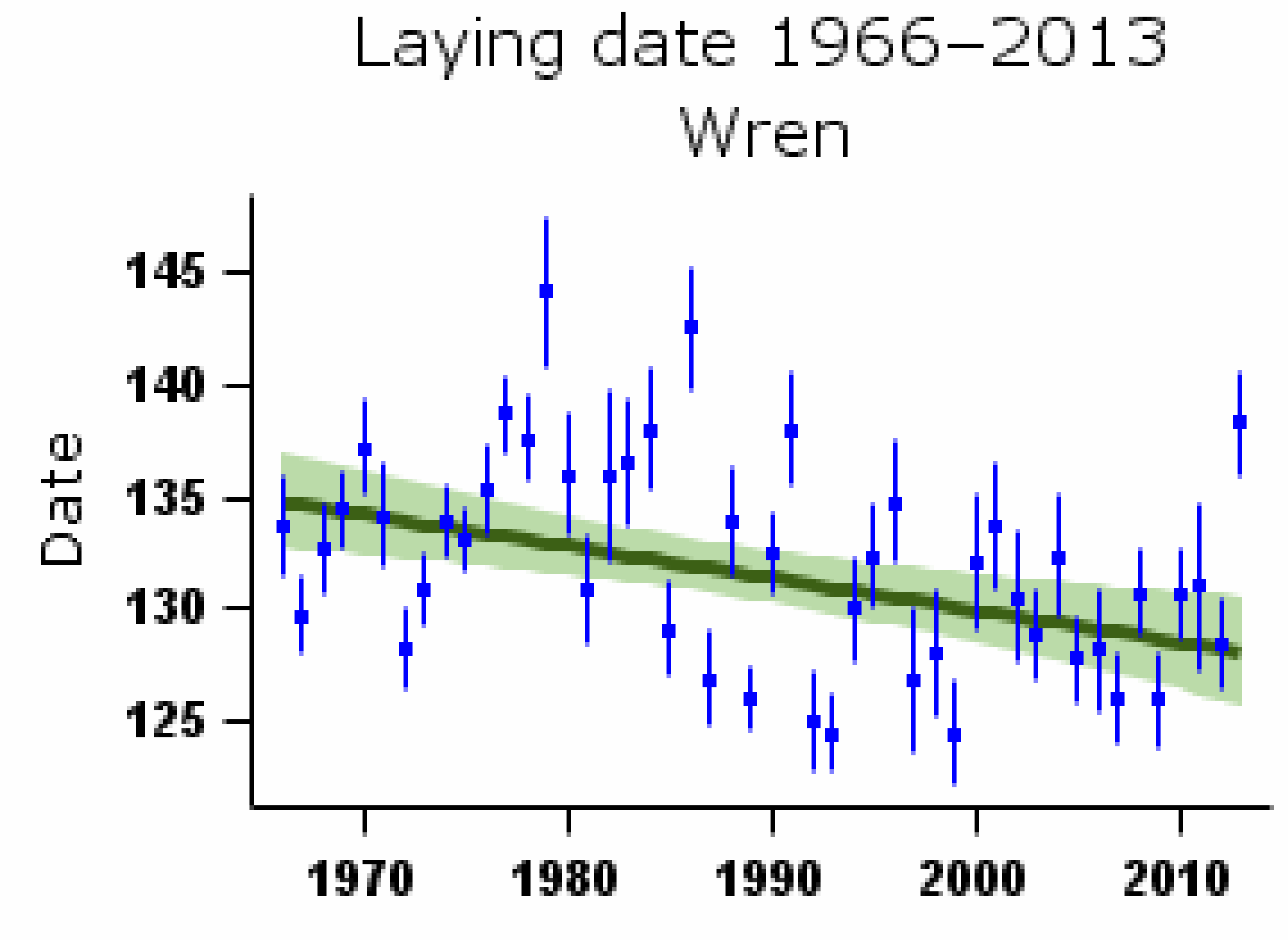


Habitat graph

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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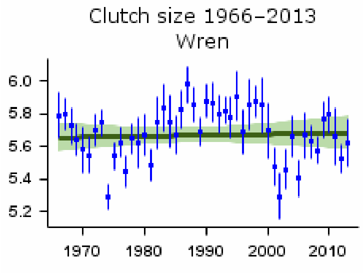
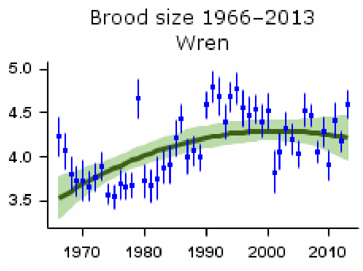
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	95	Curvilinear	2.37 fledglings	2.78 fledglings	17.3%		
Clutch size	44	1968-2012	95	None					
Brood size	44	1968-2012	125	Curvilinear	3.61 chicks	4.23 chicks	17.1%		
Nest failure rate at egg stage	44	1968-2012	139	Linear decline	1.81% nests/day	1.25% nests/day	-30.9%		
Nest failure rate at chick stage	44	1968-2012	95	Linear increase	0.74% nests/day	1.05% nests/day	41.9%		
Laying date	44	1968-2012	87	Linear decline	May 14	May 8	-6 days		
Juvenile to Adult ratio (CES)	28	1984-2012	104	Smoothed trend	94 Index value	100 Index value	6%		
Juvenile to Adult ratio (CES)	25	1987-2012	110	Smoothed trend	98 Index value	100 Index value	2%		
Juvenile to Adult ratio (CES)	10	2002-2012	112	Smoothed trend	99 Index value	100 Index value	2%		
Juvenile to Adult ratio (CES)	5	2007-2012	112	Smoothed trend	85 Index value	100 Index value	17%		

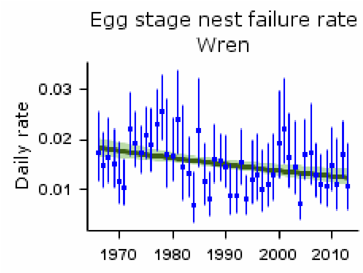
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



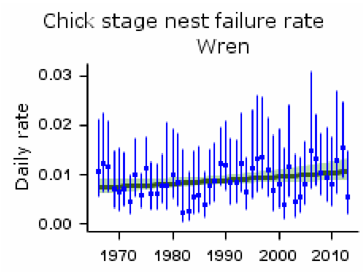
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



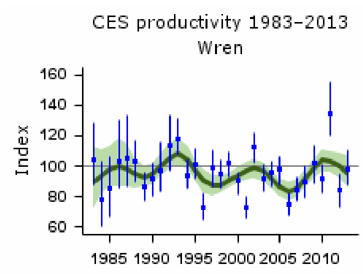
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



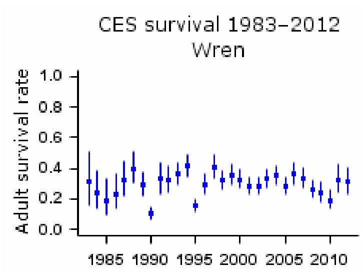
Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



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

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	Overwinter 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, reflected in larger brood sizes and an increase in fledglings per breeding attempt, but the effects of productivity are overshadowed by the strong influence of winter weather on this species.

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. These observations suggest 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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Starling

Sturnus vulgaris

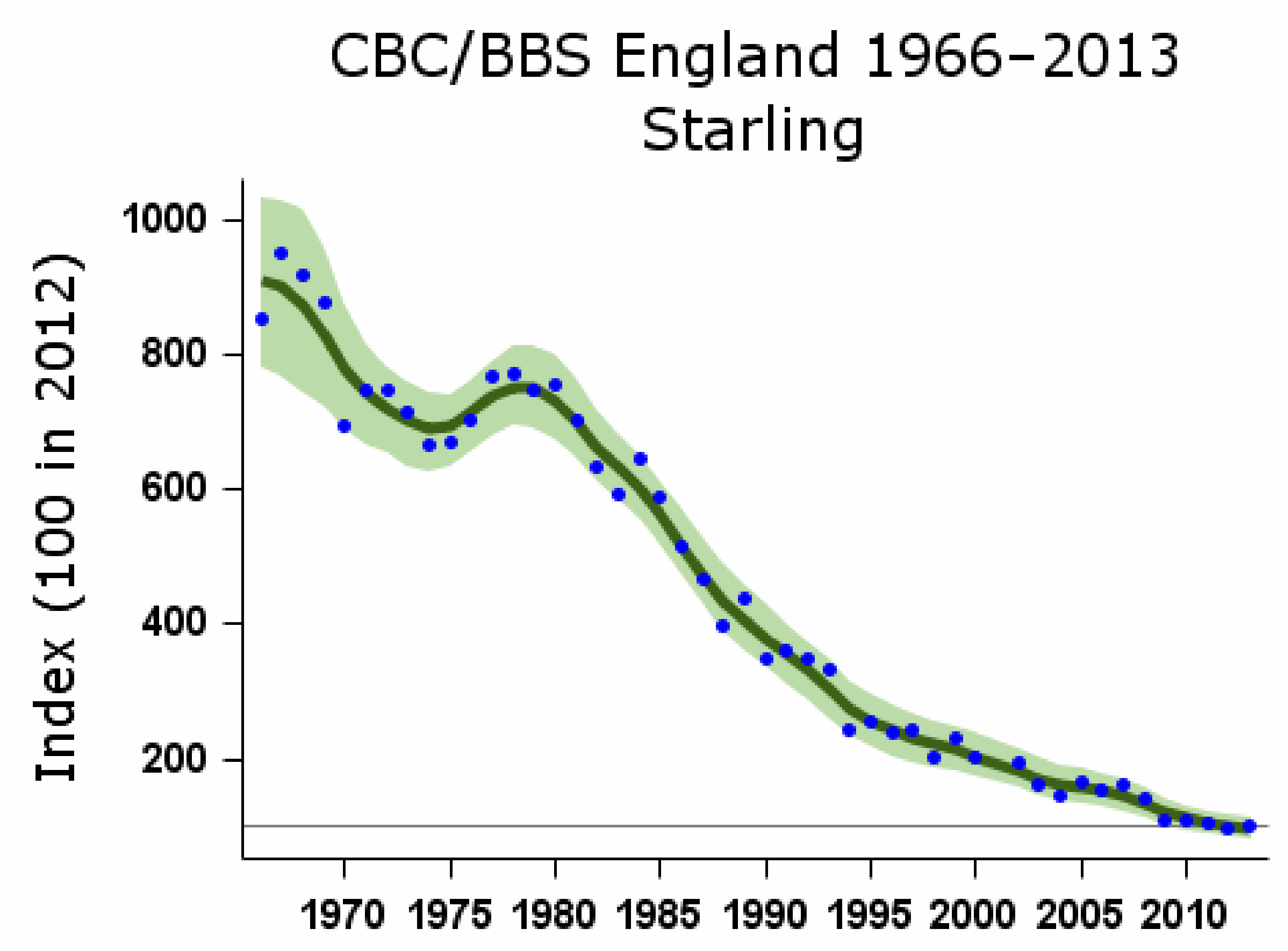
Key facts

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 a widespread moderate decline across Europe since 1980, though with little change since the late 1990s (PECBMS 2014a).



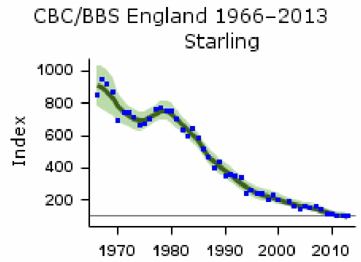
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

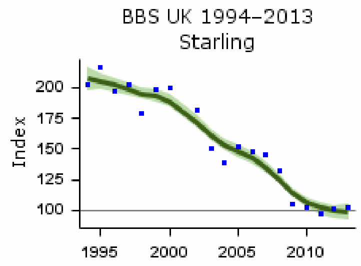
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	45	1967-2012	648	-89	-92	-85	>50	
	25	1987-2012	1073	-79	-83	-75	>50	
	10	2002-2012	1543	-45	-49	-42	>25	
	5	2007-2012	1647	-31	-36	-28	>25	
BBS UK	17	1995-2012	1771	-51	-56	-47	>50	
	10	2002-2012	1896	-42	-47	-38	>25	
	5	2007-2012	2015	-26	-32	-21	>25	
BBS England	17	1995-2012	1449	-59	-63	-57	>50	
	10	2002-2012	1543	-45	-49	-41	>25	
	5	2007-2012	1647	-31	-35	-27	>25	
BBS Scotland	17	1995-2012	151	-33	-47	-21	>25	
	10	2002-2012	165	-36	-51	-23	>25	
	5	2007-2012	182	-22	-41	-8		
BBS Wales	17	1995-2012	80	-70	-78	-61	>50	
	10	2002-2012	80	-47	-58	-37	>25	
	5	2007-2012	74	-34	-47	-22	>25	
BBS N.Ireland	17	1995-2012	80	30	5	81		
	10	2002-2012	95	-38	-49	-21	>25	
	5	2007-2012	98	-7	-26	13		

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

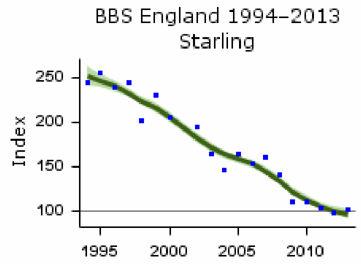
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



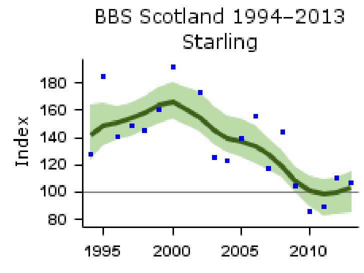
CBC/BBS England graph



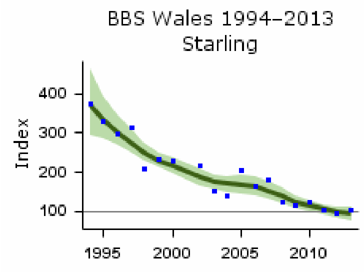
BBS UK graph



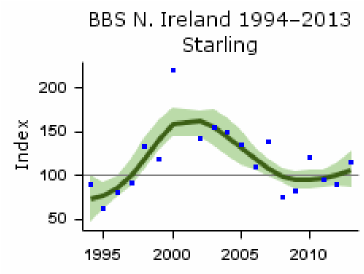
BBS England graph



BBS Scotland graph

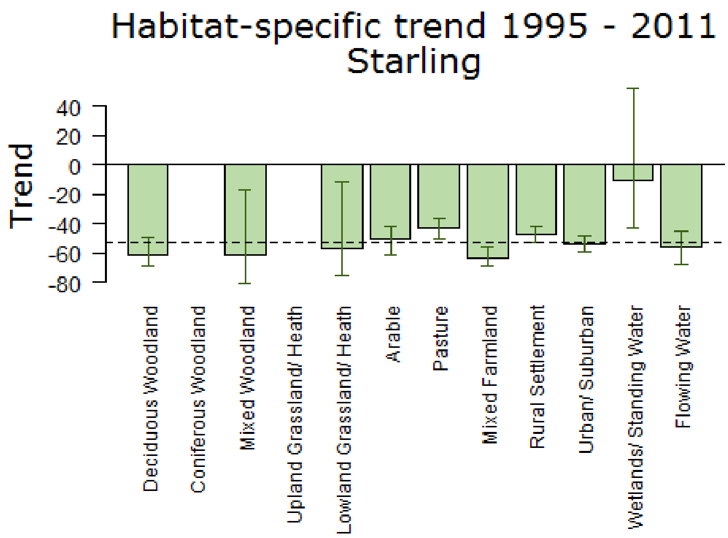


BBS Wales graph



BBS N.Ireland graph

Population trends by habitat



Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

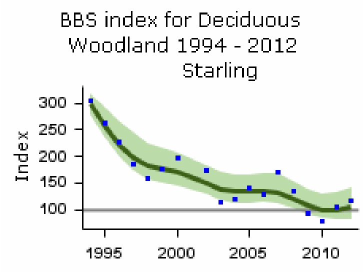
Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

More on habitat trends

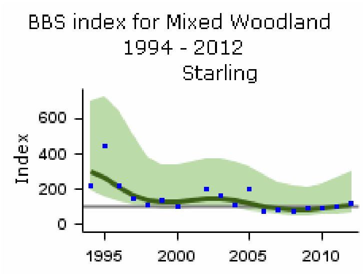
Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	238	-61	-69	-50

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Mixed Woodland	16	1995-2011	86	-62	-80	-17
Lowland Grassland/ Heath	16	1995-2011	62	-57	-75	-12
Arable	16	1995-2011	312	-51	-62	-42
Pasture	16	1995-2011	759	-43	-50	-36
Mixed Farmland	16	1995-2011	349	-63	-69	-56
Rural Settlement	16	1995-2011	575	-47	-53	-42
Urban/ Suburban	16	1995-2011	414	-54	-59	-49
Wetlands/ Standing Water	16	1995-2011	46	-11	-43	52
Flowing Water	16	1995-2011	215	-56	-68	-45

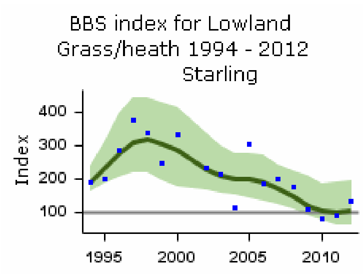
Further information on habitat-specific trends, please follow link here.



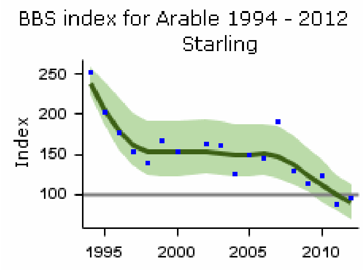
Habitat graph



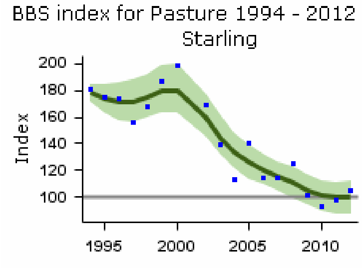
Habitat graph



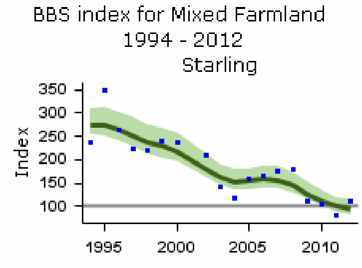
Habitat graph



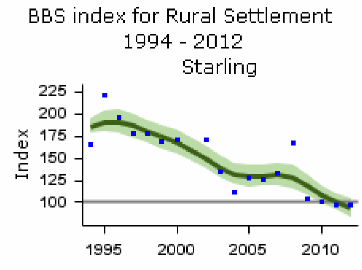
Habitat graph



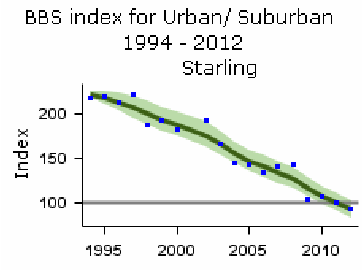
Habitat graph



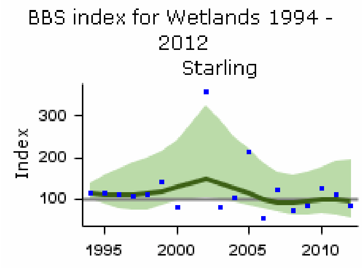
Habitat graph



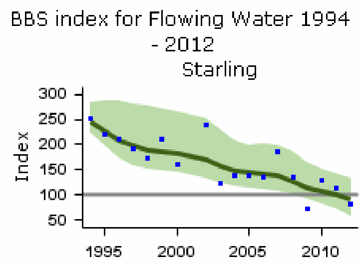
Habitat graph



Habitat graph

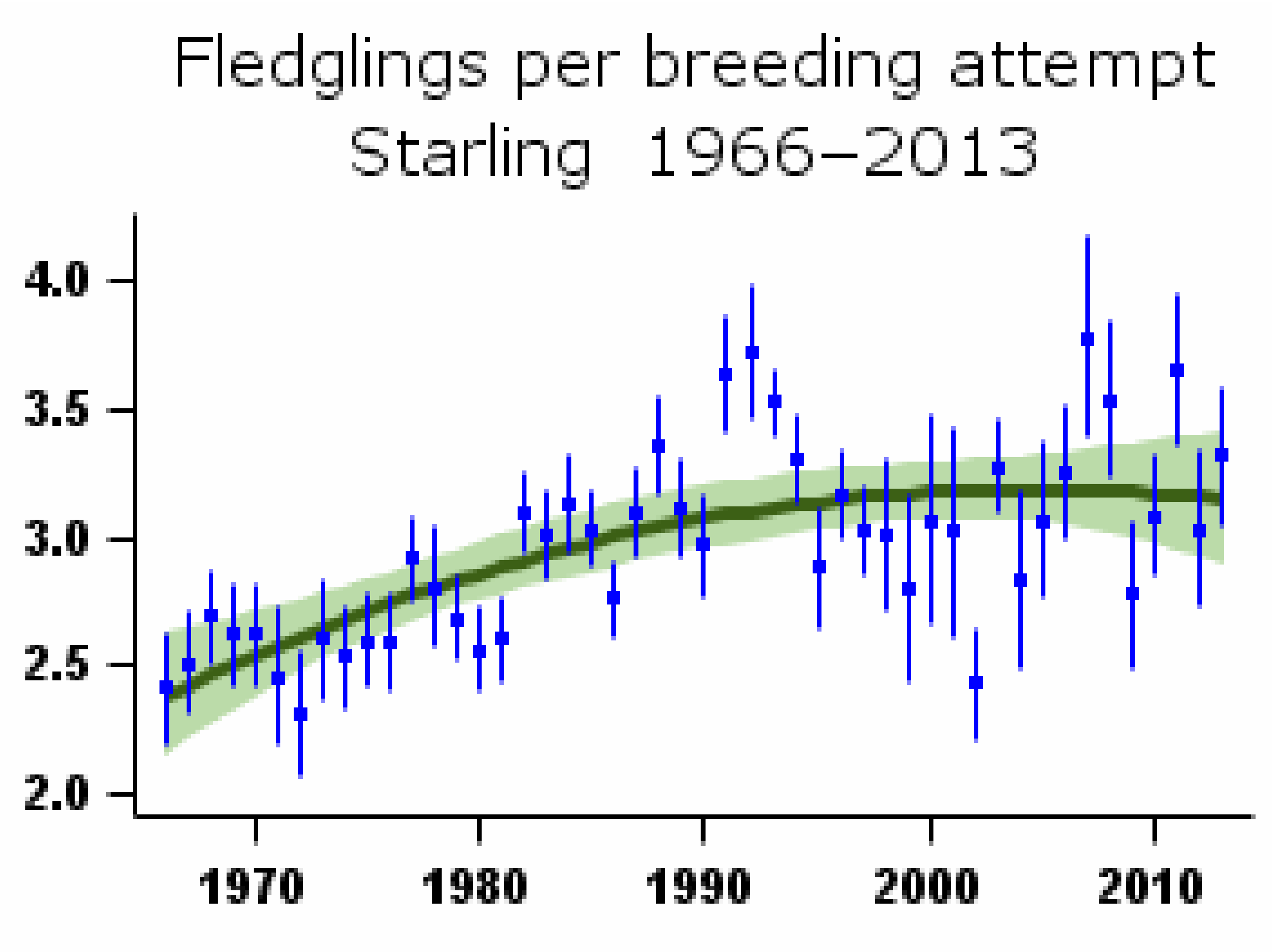


Habitat graph

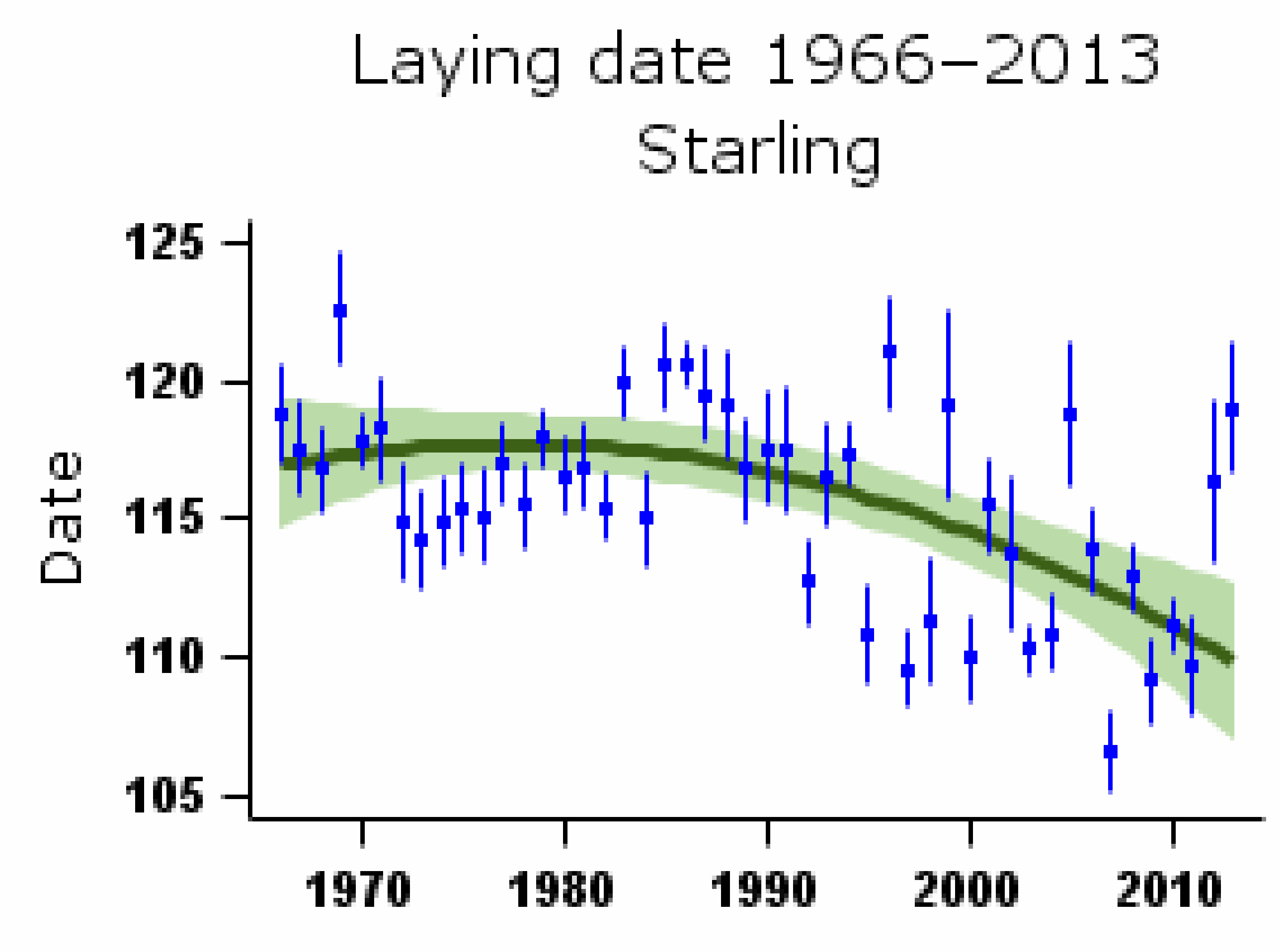


Habitat graph

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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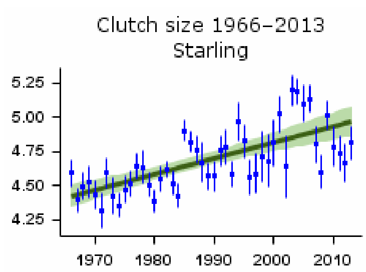
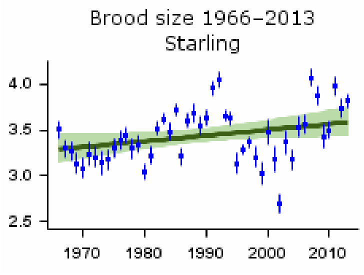
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	115	Curvilinear	2.46 fledglings	3.15 fledglings	28.1%		
Clutch size	44	1968-2012	76	Linear increase	4.44 eggs	4.95 eggs	11.4%		
Brood size	44	1968-2012	237	Linear increase	3.30 chicks	3.58 chicks	8.4%		
Nest failure rate at egg stage	44	1968-2012	121	Linear decline	1.08% nests/day	0.25% nests/day	-76.9%		
Nest failure rate at chick stage	44	1968-2012	139	Curvilinear	0.65% nests/day	0.31% nests/day	-52.3%		
Laying date	44	1968-2012	85	Curvilinear	Apr 27	Apr 20	-7 days		

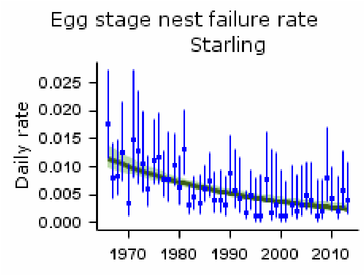
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



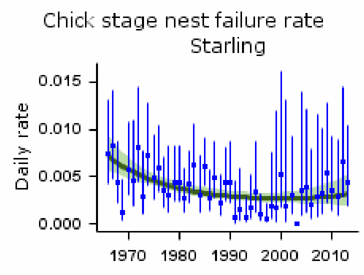
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



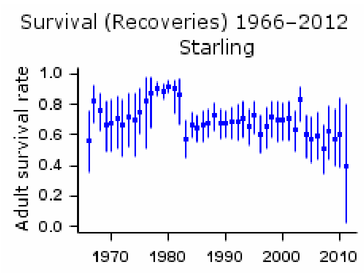
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



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



Proportion of adult birds surviving to following year based on dead recoveries of ringed birds - error bars represent 95% confidence limits

Causes of change

There is good evidence that changes in first-year overwinter survival rates best account for observed population change. Although the ecological drivers of Starling decline are poorly understood, 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	Agricultural intensification

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. This pattern is supported by a more recent, integrated, population analysis (Robinson et al. 2014). The decline in survival rates nationwide coincided with the major period of population decline. MacLeodet al. (2008) also provide evidence linking Starling declines to the environmental conditions outside the breeding season, 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, in which they are mainly found, 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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

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Dipper

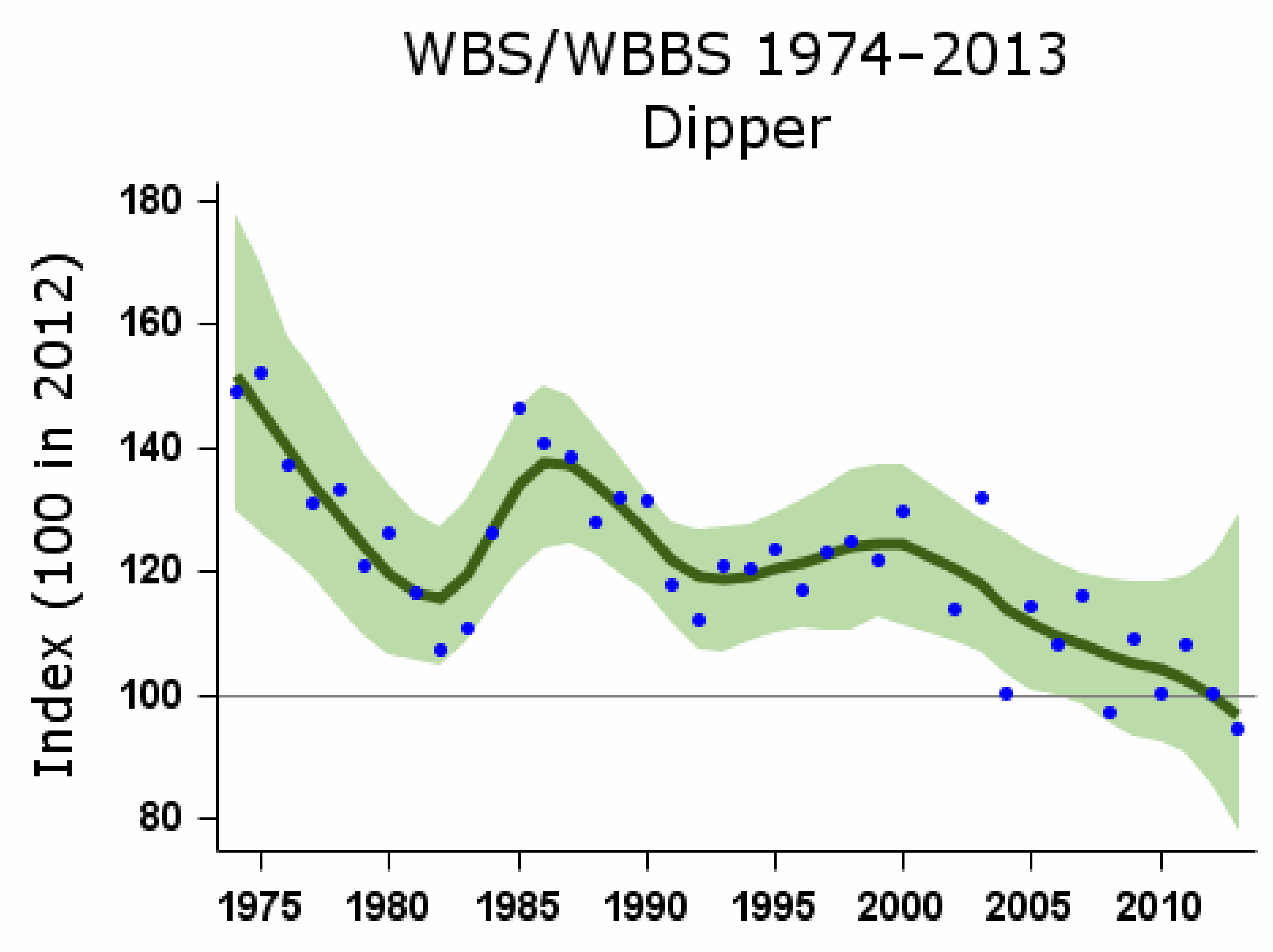
Cinclus cinclus

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-borne 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). Thus, some of the UK fluctuations may relate to winter weather.



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

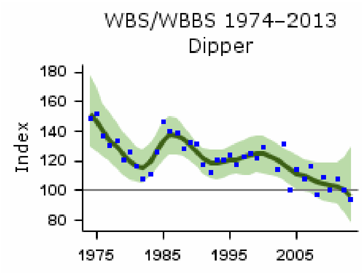
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
WBS/WBBS waterways	37	1975-2012	64	-32	-50	-4	>25	
	25	1987-2012	78	-27	-42	-2	>25	
	10	2002-2012	112	-17	-30	5		
	5	2007-2012	98	-7	-18	9		

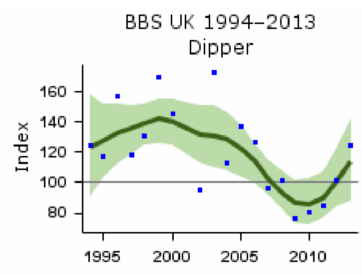
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	17	1995-2012	80	22	-44	10		
	10	2002-2012	66	-24	-45	7		
	5	2007-2012	77	-3	-24	25		

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

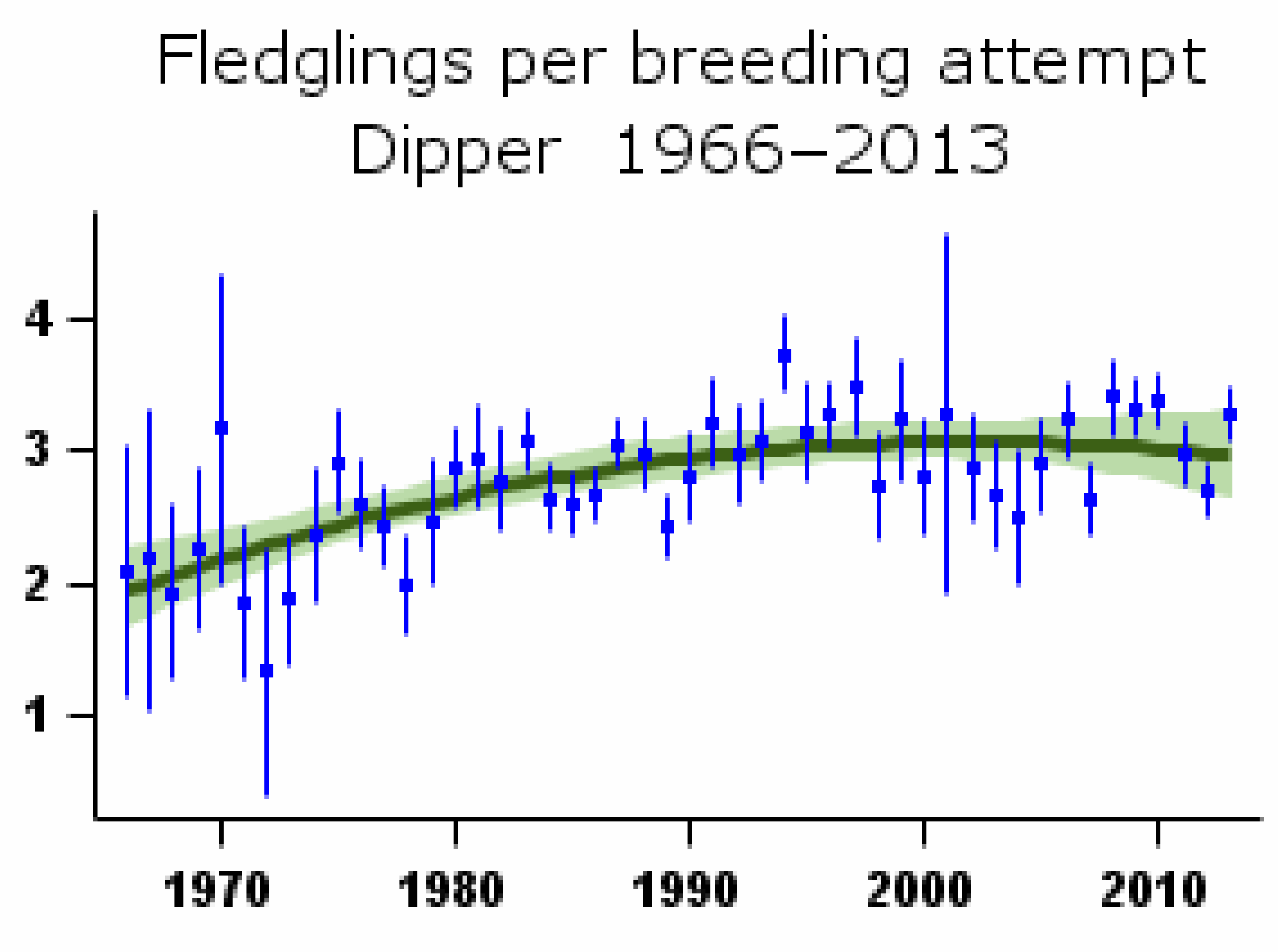


WBS/WBBS waterways graph

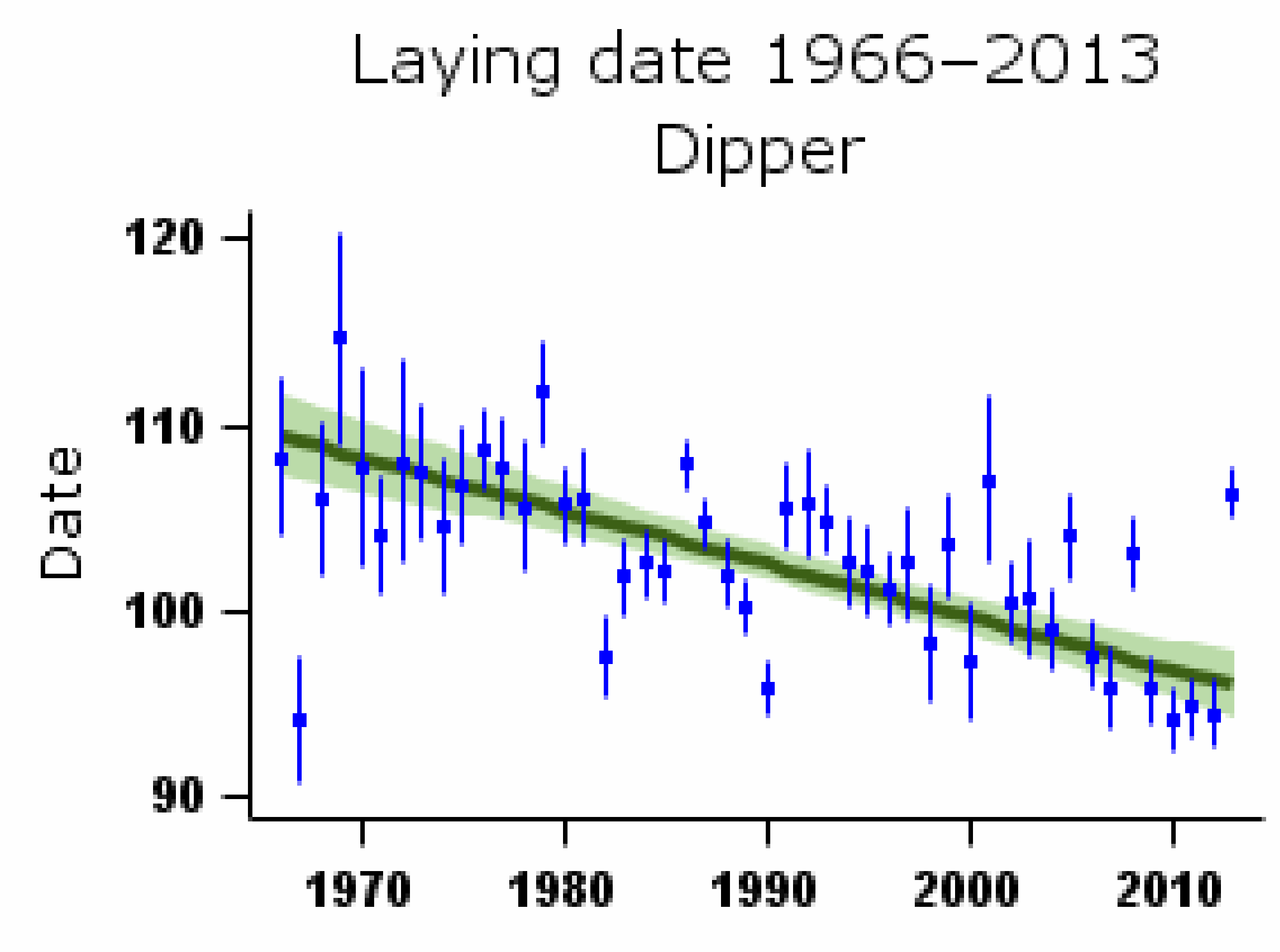


BBS UK graph

Demographic trends



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

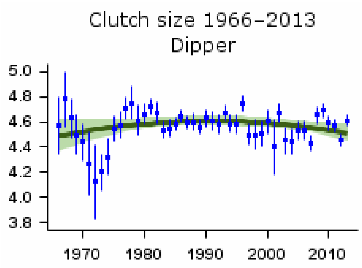


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

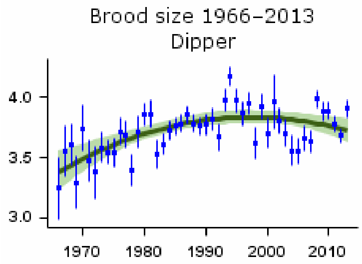
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	83	Curvilinear	2.06 fledglings	2.98 fledglings	44.6%		
Clutch size	44	1968-2012	82	Curvilinear	4.50 eggs	4.51 eggs	0.2%		
Brood size	44	1968-2012	152	Curvilinear	3.44 chicks	3.74 chicks	8.7%		
Nest failure rate at egg stage	44	1968-2012	112	Curvilinear	2.87% nests/day	0.48% nests/day	-83.3%		
Nest failure rate at chick stage	44	1968-2012	83	None					
Laying date	44	1968-2012	69	Linear decline	Apr 19	Apr 6	-13 days		

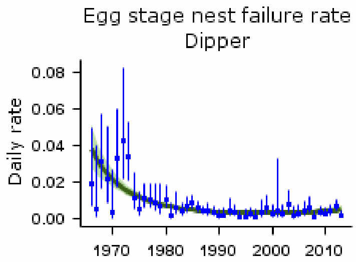
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



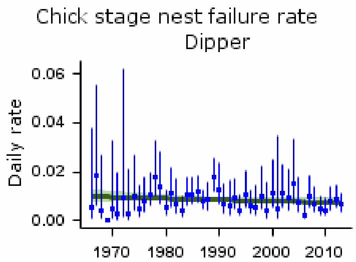
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



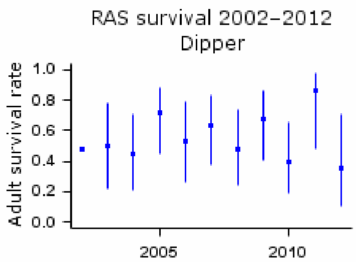
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



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



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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

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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); 5,332 pairs in 2012 (Hayhow et al. 2014)

Status summary

The first two 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 was later 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). By 2008-11, the number of occupied 10-km squares had fallen by 43% since 1968-72 (Balmer et al. 2013). Further fieldwork in 2012 found that numbers had decreased by 72% since 1988-91 (Hayhow et al. 2014). 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. There has been little change in numbers across Europe since 1998.

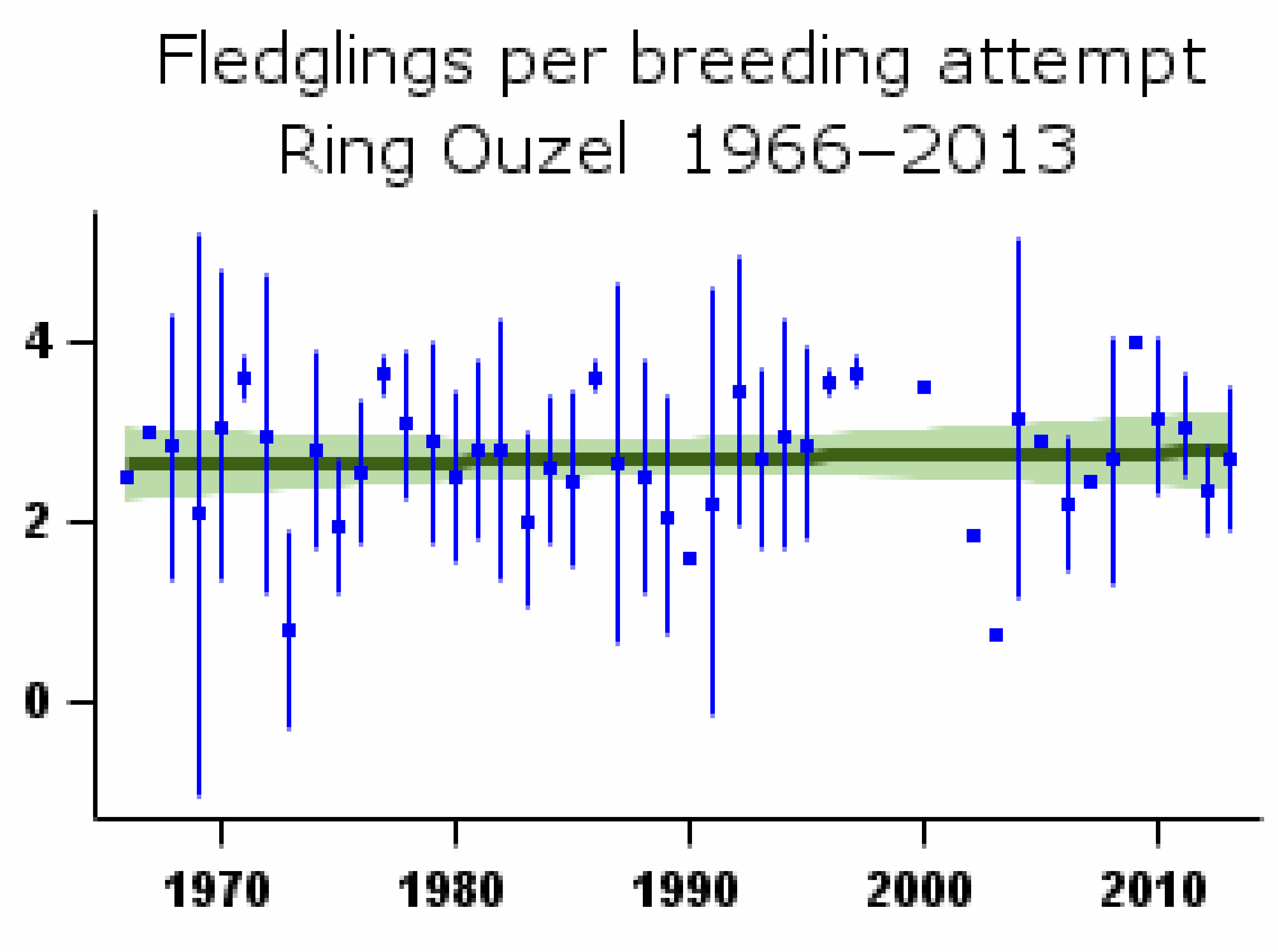
It has proved difficult to establish any reasons for decline that are linked to the breeding grounds (Buchanan et al. 2003). In southeast Scotland, however, the breeding sites that are still occupied tend to be those at higher altitude and that have retained extensive cover of heather (Sim et al. 2007b). 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, with reduced early-season productivity, rates of renesting and first-year survival all playing a part.

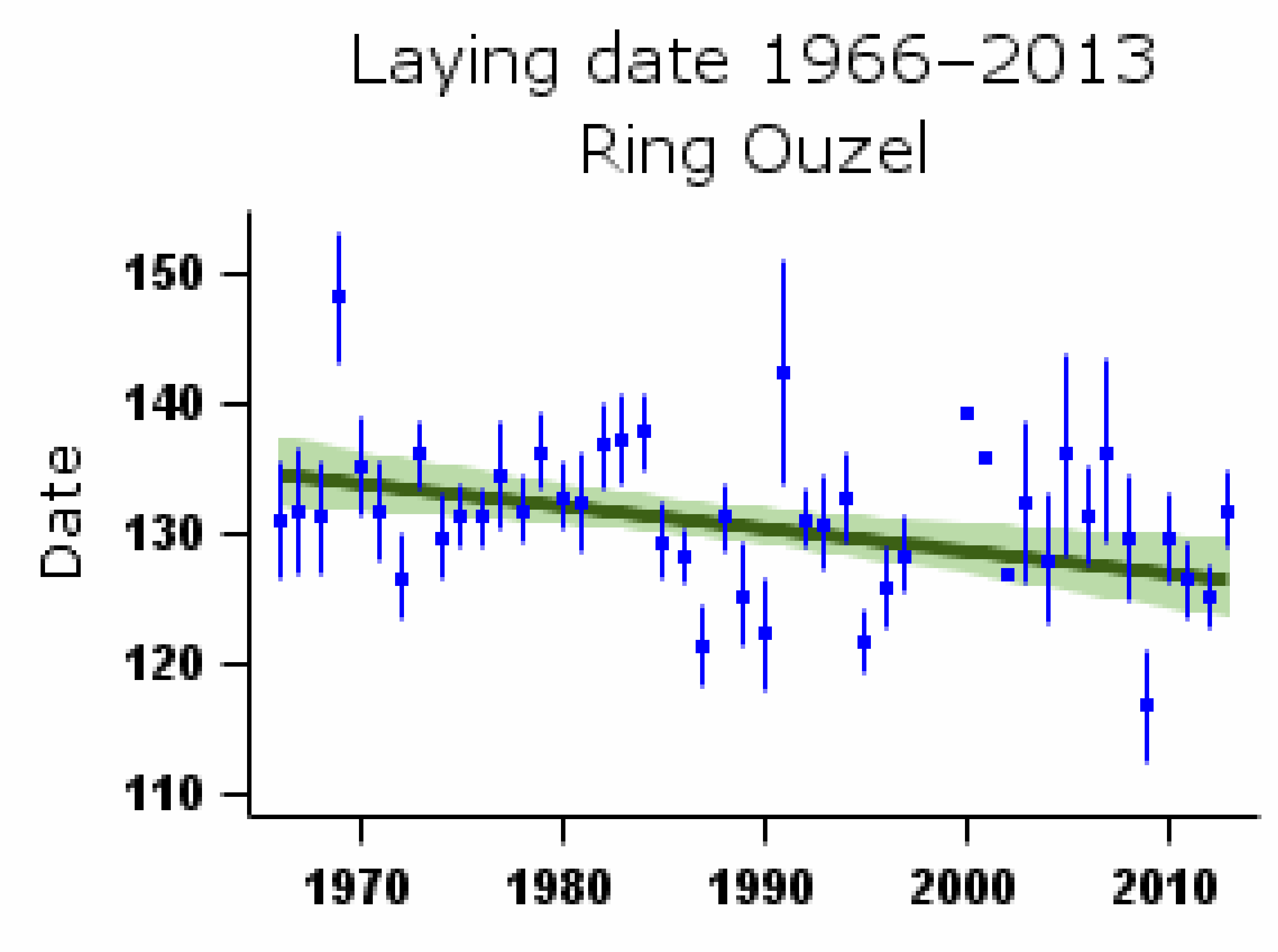
Population changes in detail

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

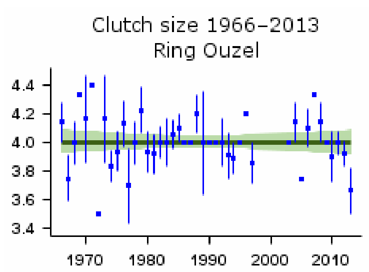


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

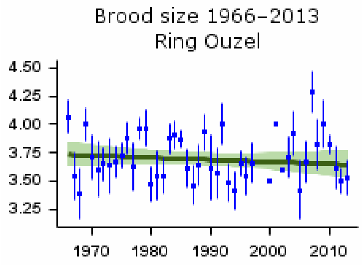
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	11	None					
Clutch size	44	1968-2012	10	None					Small sample
Brood size	44	1968-2012	22	None					Small sample
Nest failure rate at egg stage	44	1968-2012	12	None					Small sample
Nest failure rate at chick stage	44	1968-2012	15	None					Small sample
Laying date	44	1968-2012	23	Linear decline	May 14	May 7	-7 days		Small sample

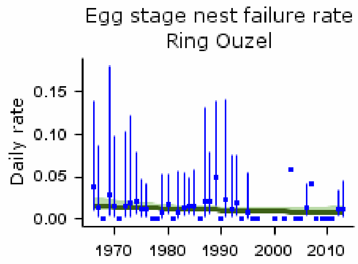
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



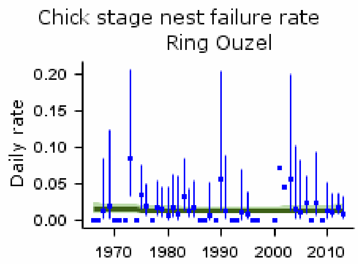
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



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

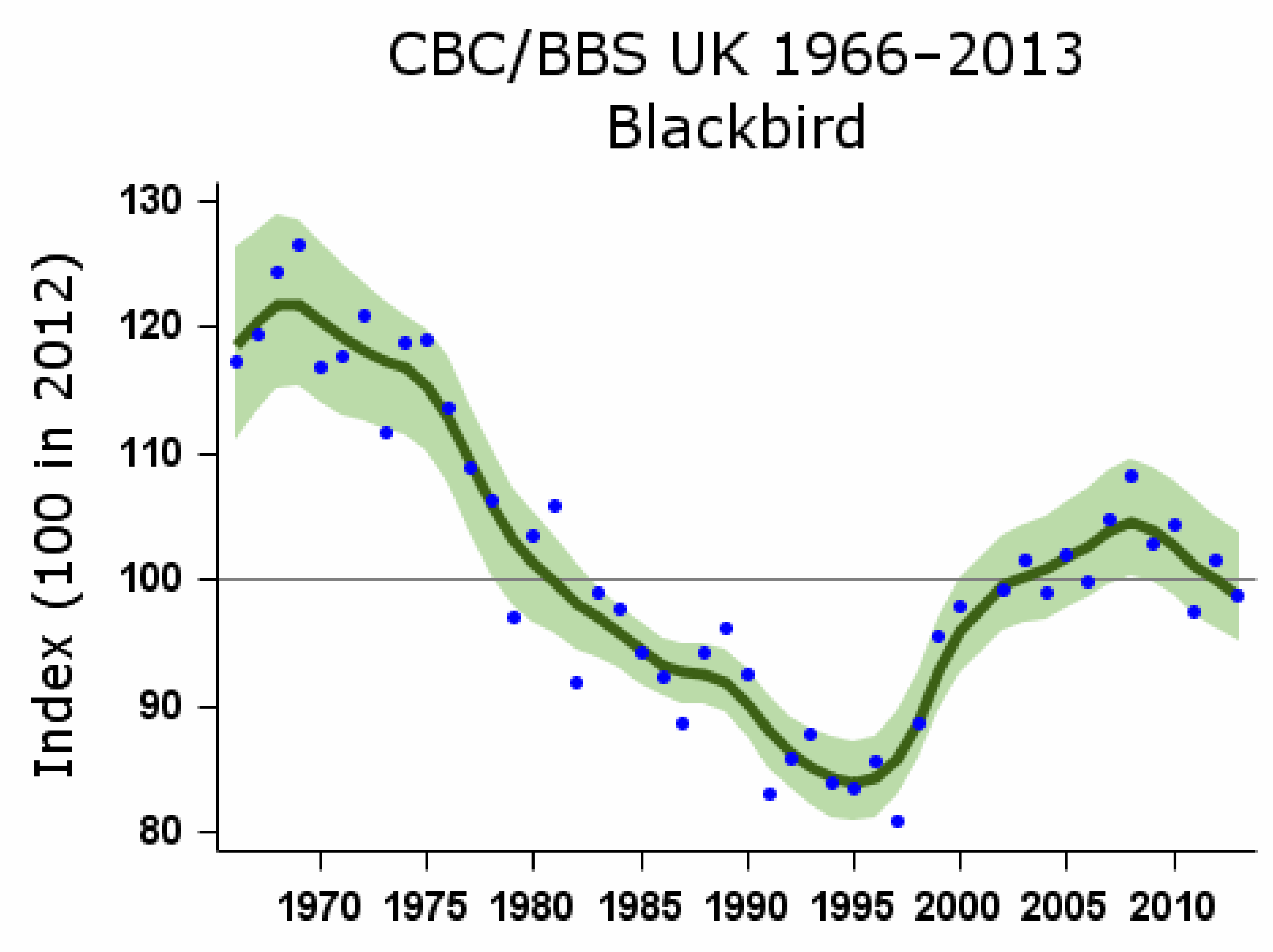
Turdus merula

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, which currently has stalled. 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 2014a).



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

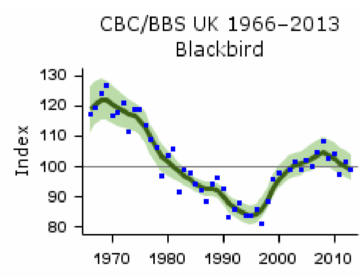
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	45	1967-2012	1139	-17	-25	-7		
	25	1987-2012	1867	8	3	15		
	10	2002-2012	2817	0	-1	3		
	5	2007-2012	3141	-4	-5	-2		

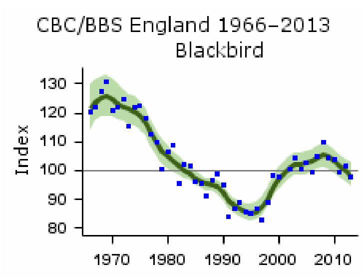
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	45	1967-2012	922	-19	-26	-10		
	25	1987-2012	1501	5	0	11		
	10	2002-2012	2249	-1	-3	1		
	5	2007-2012	2532	-4	-5	-3		
CES adults	28	1984-2012	100	-9	-24	6		
	25	1987-2012	106	-13	-23	0		
	10	2002-2012	107	-11	-19	-4		
	5	2007-2012	105	-1	-7	7		
CES juveniles	28	1984-2012	90	-49	-67	-20	>25	
	25	1987-2012	96	-21	-41	7		
	10	2002-2012	97	-21	-36	-3		
	5	2007-2012	92	-32	-42	-18	>25	
BBS UK	17	1995-2012	2493	21	17	24		
	10	2002-2012	2817	1	-1	3		
	5	2007-2012	3141	-3	-5	-2		
BBS England	17	1995-2012	1993	18	15	22		
	10	2002-2012	2249	-1	-3	1		
	5	2007-2012	2532	-4	-6	-3		
BBS Scotland	17	1995-2012	200	31	13	51		
	10	2002-2012	226	10	1	19		
	5	2007-2012	263	1	-4	8		
BBS Wales	17	1995-2012	198	38	27	50		
	10	2002-2012	224	11	3	21		
	5	2007-2012	223	-5	-10	1		
BBS N.Ireland	17	1995-2012	87	31	2	54		
	10	2002-2012	101	-18	-25	-11		
	5	2007-2012	105	-9	-14	-4		

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

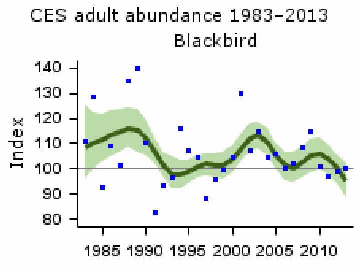
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



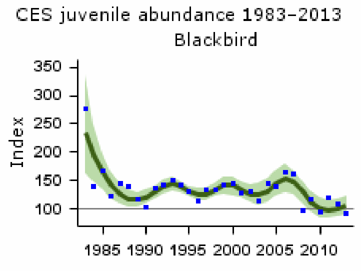
CBC/BBS UK graph



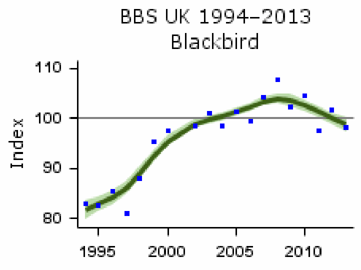
CBC/BBS England graph



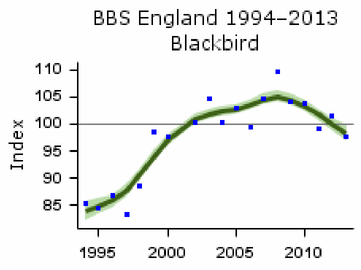
CES adults graph



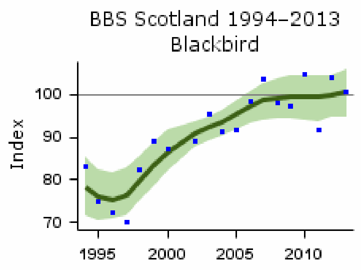
CES juveniles graph



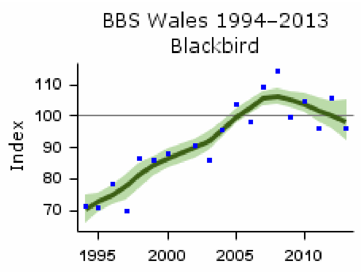
BBS UK graph



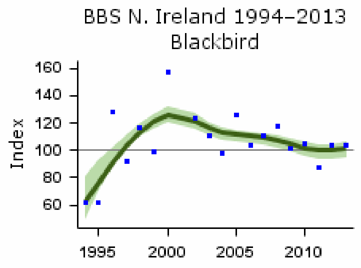
BBS England graph



BBS Scotland graph

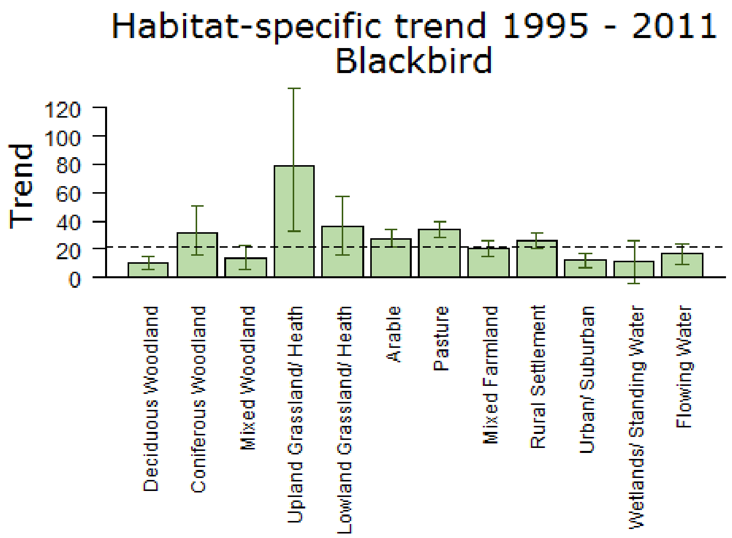


BBS Wales graph



BBS N.Ireland graph

Population trends by habitat



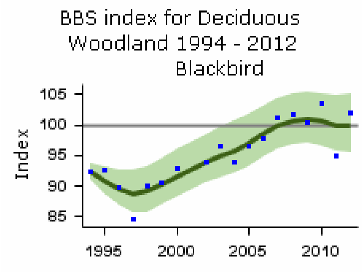
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

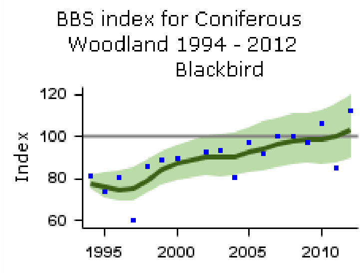
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	942	10	6	15
Coniferous Woodland	16	1995-2011	214	32	16	51
Mixed Woodland	16	1995-2011	498	14	6	22
Upland Grassland/ Heath	16	1995-2011	35	79	32	134
Lowland Grassland/ Heath	16	1995-2011	190	36	16	58
Arable	16	1995-2011	860	28	22	34
Pasture	16	1995-2011	1422	33	28	39
Mixed Farmland	16	1995-2011	824	20	15	26
Rural Settlement	16	1995-2011	968	26	20	32
Urban/ Suburban	16	1995-2011	469	12	7	18
Wetlands/ Standing Water	16	1995-2011	120	12	-4	26
Flowing Water	16	1995-2011	574	17	9	24

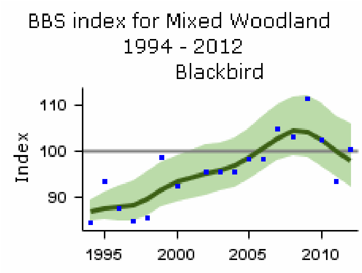
Further information on habitat-specific trends, please follow link here.



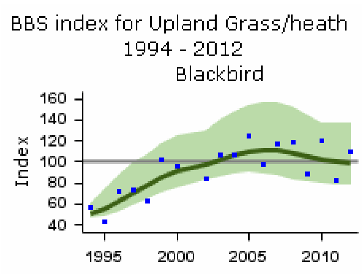
Habitat graph



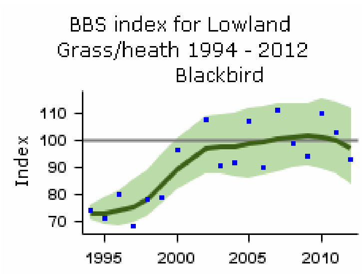
Habitat graph



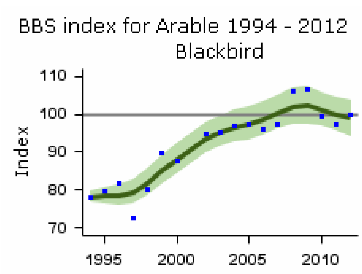
Habitat graph



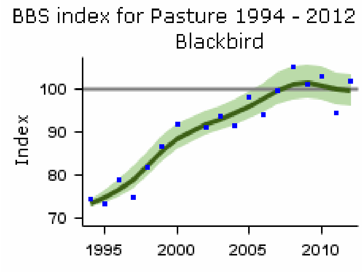
Habitat graph



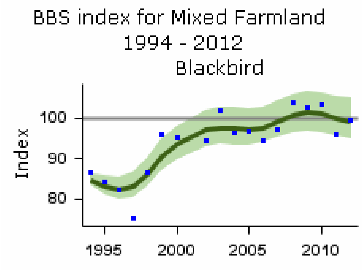
Habitat graph



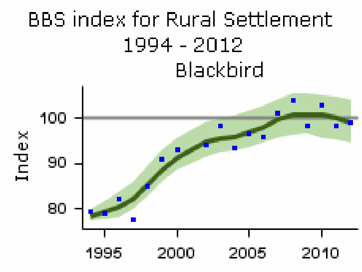
Habitat graph



Habitat graph



Habitat graph



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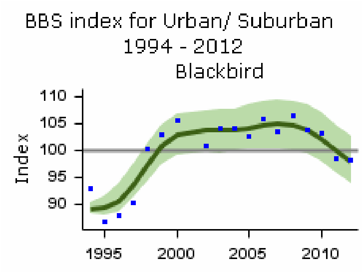
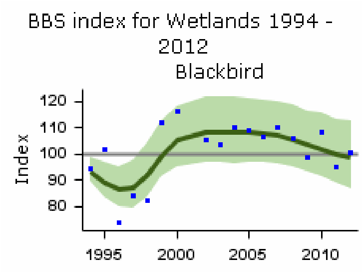
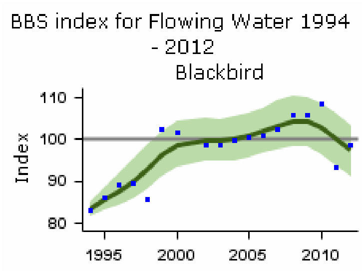


Habitat graph

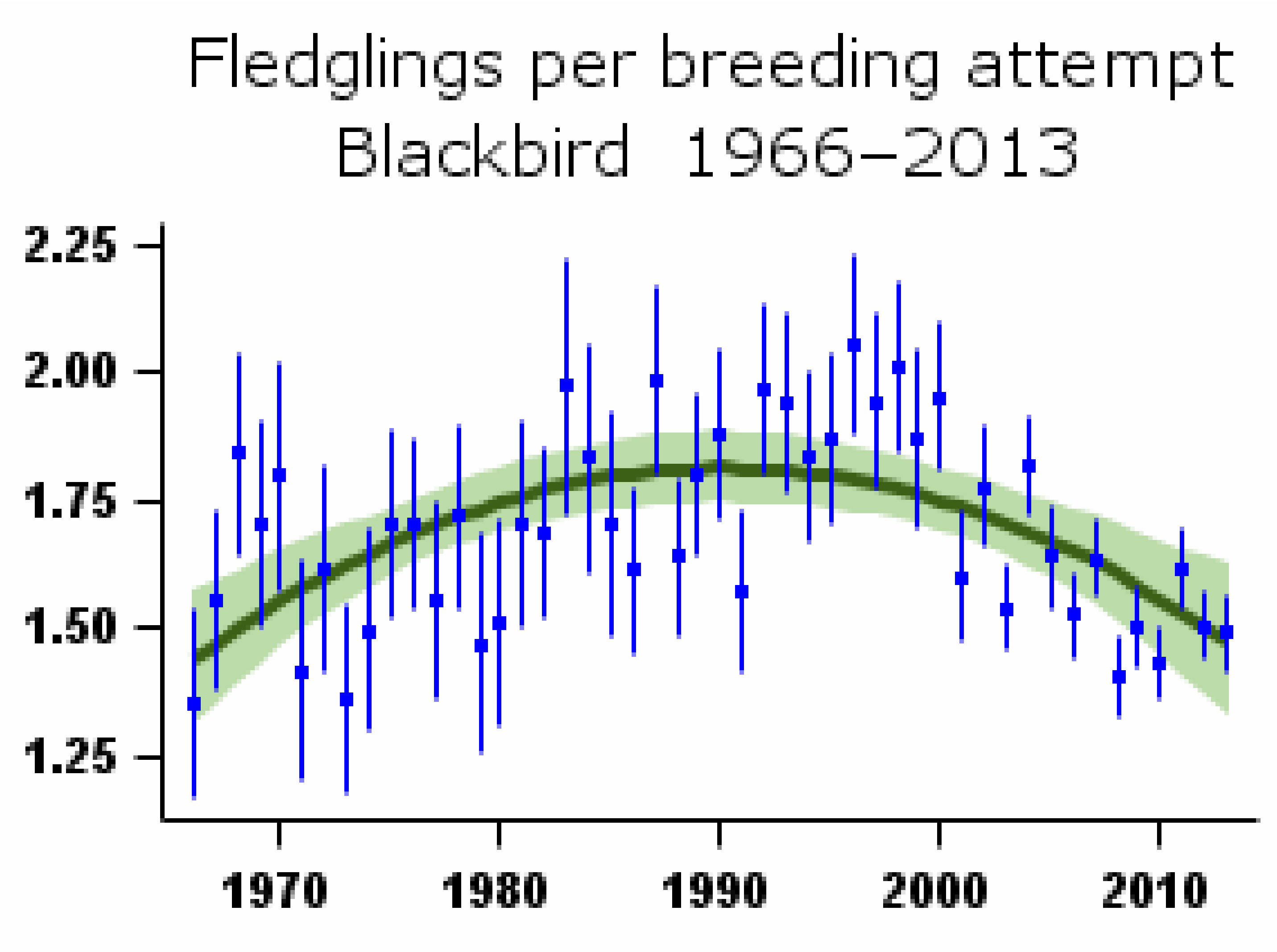


Habitat graph

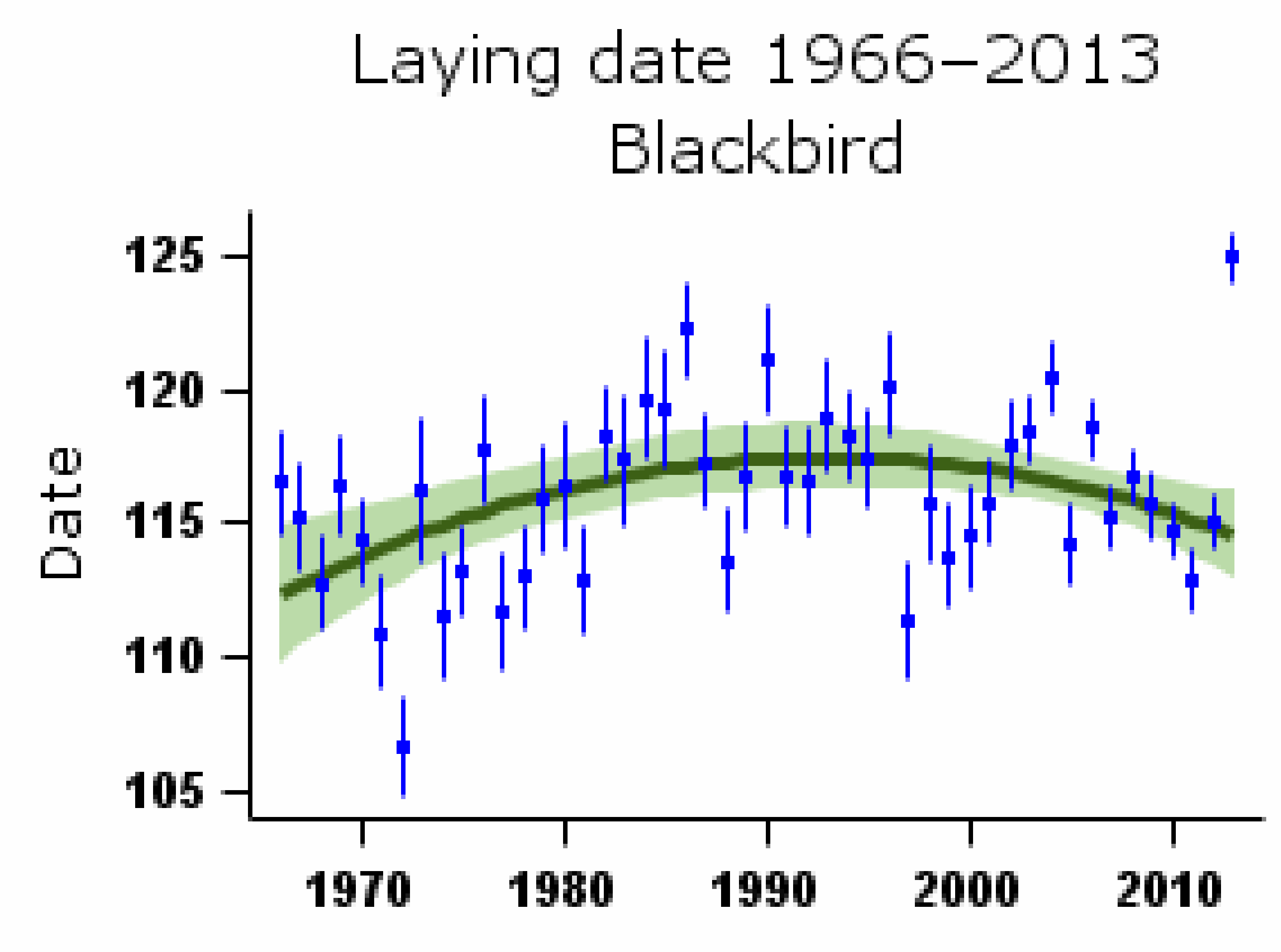


Habitat graph

Demographic trends



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

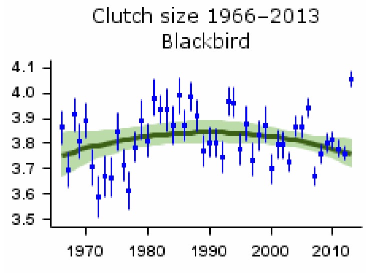


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

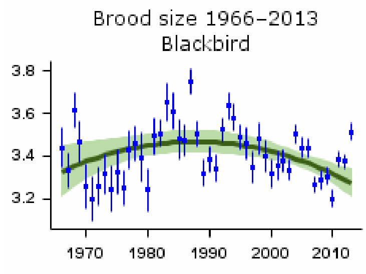
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	246	Curvilinear	1.50 fledglings	1.51 fledglings	0.5%		
Clutch size	44	1968-2012	206	Curvilinear	3.77 eggs	3.76 eggs	-0.1%		
Brood size	44	1968-2012	269	Curvilinear	3.35 chicks	3.29 chicks	-1.9%		
Nest failure rate at egg stage	44	1968-2012	302	Curvilinear	2.58% nests/day	3.90% nests/day	51.2%		
Nest failure rate at chick stage	44	1968-2012	247	Linear decline	2.86% nests/day	1.92% nests/day	-32.9%		
Laying date	44	1968-2012	246	Curvilinear	Apr 23	Apr 25	2 days		
Juvenile to Adult ratio (CES)	28	1984-2012	102	Smoothed trend	163 Index value	100 Index value	-39%	>25	
Juvenile to Adult ratio (CES)	25	1987-2012	108	Smoothed trend	133 Index value	100 Index value	-25%		
Juvenile to Adult ratio (CES)	10	2002-2012	109	Smoothed trend	112 Index value	100 Index value	-11%		
Juvenile to Adult ratio (CES)	5	2007-2012	107	Smoothed trend	131 Index value	100 Index value	-24%		

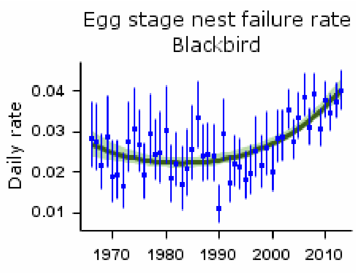
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



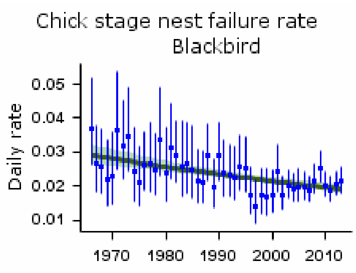
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



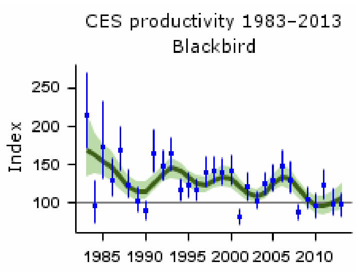
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



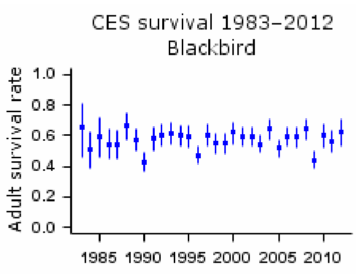
Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



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

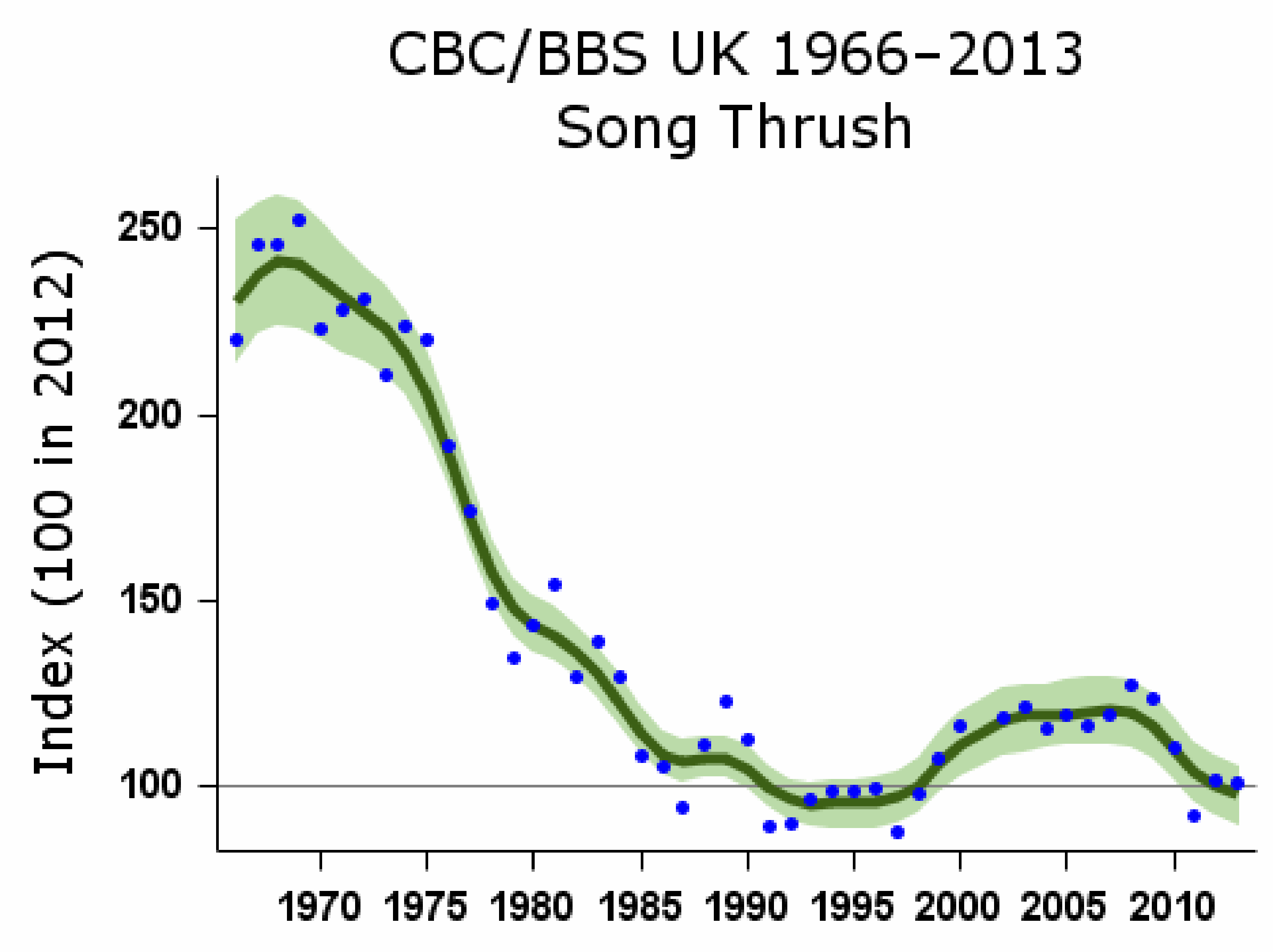
Key facts

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: priority species (*clarkei* and *hebridensis*)
Long-term trend:	UK, 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 latter part of this decline can also be seen in the CES index. BBS data from all UK countries show increase from 1994 to 2008, followed by a sharp downturn, but population levels remained relatively low throughout. The BBS PECBMS 2014a).



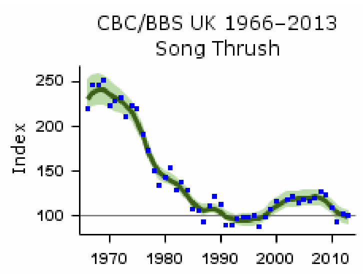
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

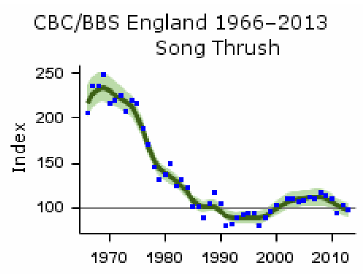
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	45	1967-2012	931	-58	-64	-51	>50	
	25	1987-2012	1504	-6	-16	4		
	10	2002-2012	2301	-15	-18	-12		
	5	2007-2012	2558	-17	-19	-15		
CBC/BBS England	45	1967-2012	741	-56	-63	-49	>50	
	25	1987-2012	1186	-1	-13	10		
	10	2002-2012	1809	-7	-9	-3		
	5	2007-2012	2032	-11	-14	-9		
CES adults	28	1984-2012	82	-30	-43	-13	>25	
	25	1987-2012	87	-22	-38	-6		
	10	2002-2012	89	-9	-20	5		
	5	2007-2012	85	-15	-24	-4		
CES juveniles	28	1984-2012	69	-58	-72	-39	>50	
	25	1987-2012	73	-23	-46	5		
	10	2002-2012	77	-24	-40	-3		
	5	2007-2012	73	-26	-37	-7	>25	
BBS UK	17	1995-2012	2002	5	1	10		
	10	2002-2012	2301	-14	-17	-11		
	5	2007-2012	2558	-16	-18	-14		
BBS England	17	1995-2012	1569	10	5	15		
	10	2002-2012	1809	-6	-9	-3		
	5	2007-2012	2032	-11	-13	-9		
BBS Scotland	17	1995-2012	177	-8	-23	9		
	10	2002-2012	198	-30	-39	-19	>25	
	5	2007-2012	228	-26	-33	-19	>25	
BBS Wales	17	1995-2012	169	14	-1	26		
	10	2002-2012	192	-21	-26	-13		
	5	2007-2012	191	-21	-26	-17		
BBS N.Ireland	17	1995-2012	78	18	-8	48		
	10	2002-2012	92	-27	-36	-15	>25	
	5	2007-2012	97	-28	-35	-21	>25	

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

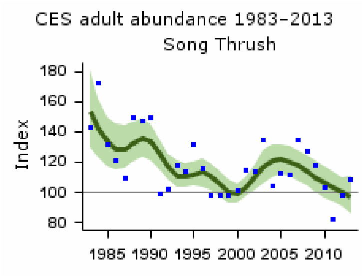
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



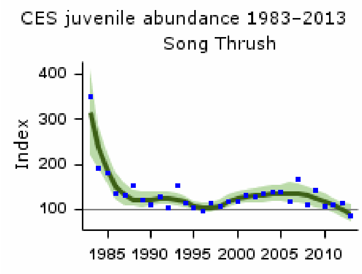
CBC/BBS UK graph



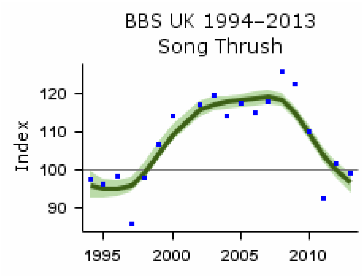
CBC/BBS England graph



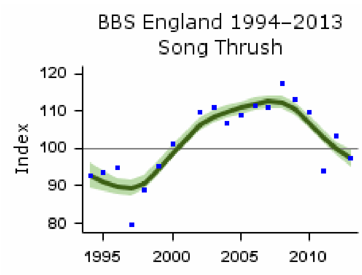
CES adults graph



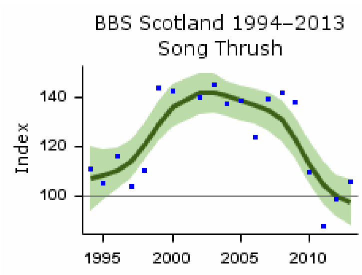
CES juveniles graph



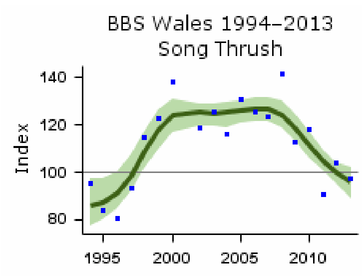
BBS UK graph



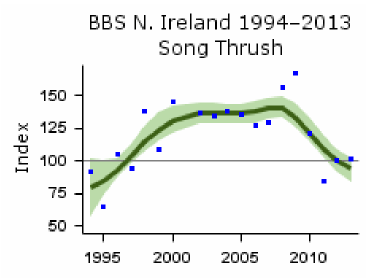
BBS England graph



BBS Scotland graph

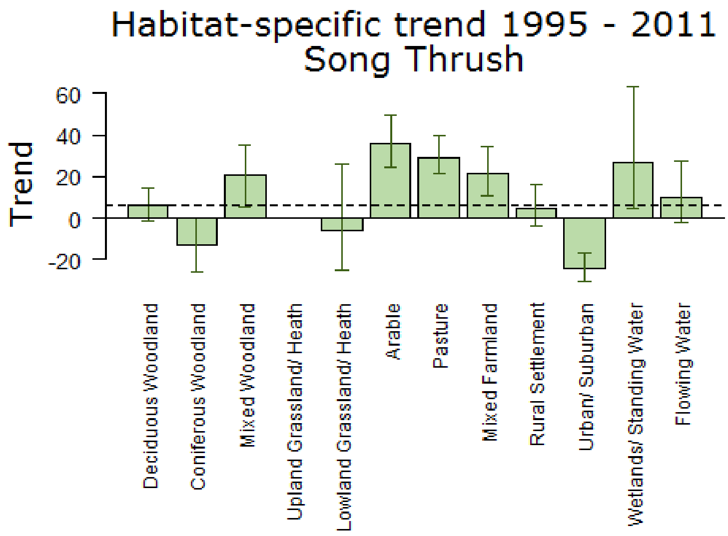


BBS Wales graph



BBS N.Ireland graph

Population trends by habitat



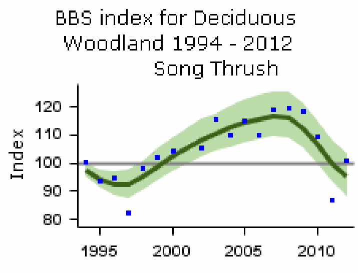
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

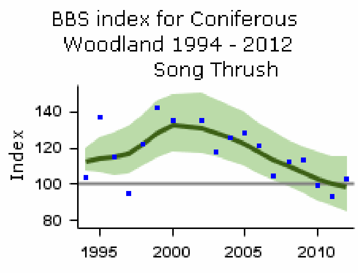
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	631	6	-1	15
Coniferous Woodland	16	1995-2011	166	-13	-26	0
Mixed Woodland	16	1995-2011	350	20	6	35
Lowland Grassland/ Heath	16	1995-2011	125	-6	-25	26
Arable	16	1995-2011	477	36	24	50
Pasture	16	1995-2011	937	29	22	40
Mixed Farmland	16	1995-2011	418	21	11	34
Rural Settlement	16	1995-2011	603	5	-4	16
Urban/ Suburban	16	1995-2011	313	-24	-30	-16
Wetlands/ Standing Water	16	1995-2011	62	27	5	63
Flowing Water	16	1995-2011	332	10	-2	27

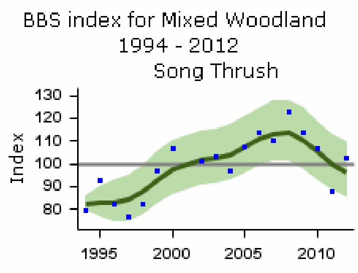
Further information on habitat-specific trends, please follow link here.



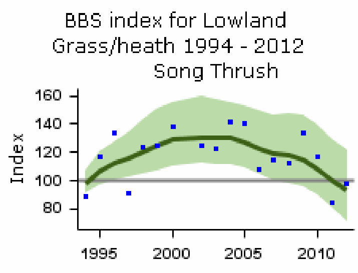
Habitat graph



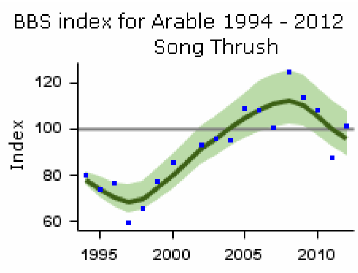
Habitat graph



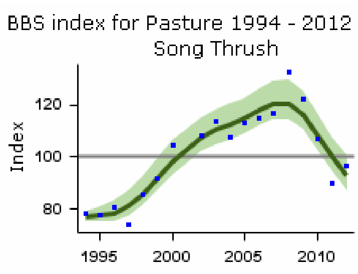
Habitat graph



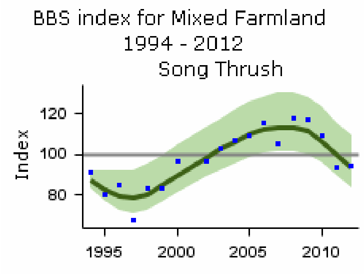
Habitat graph



Habitat graph



Habitat graph



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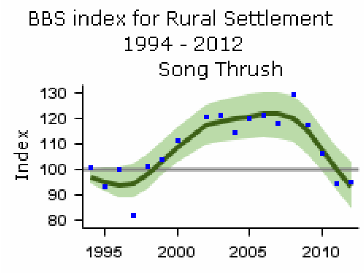

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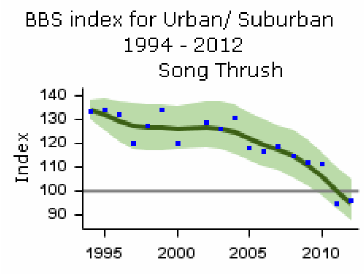

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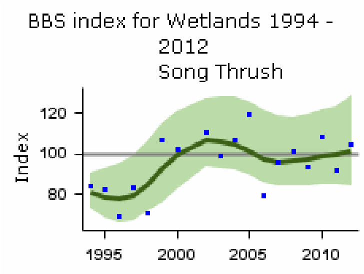

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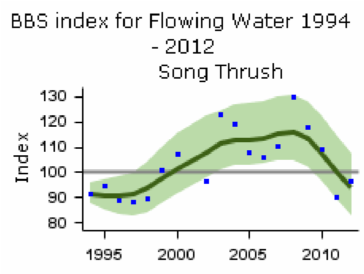
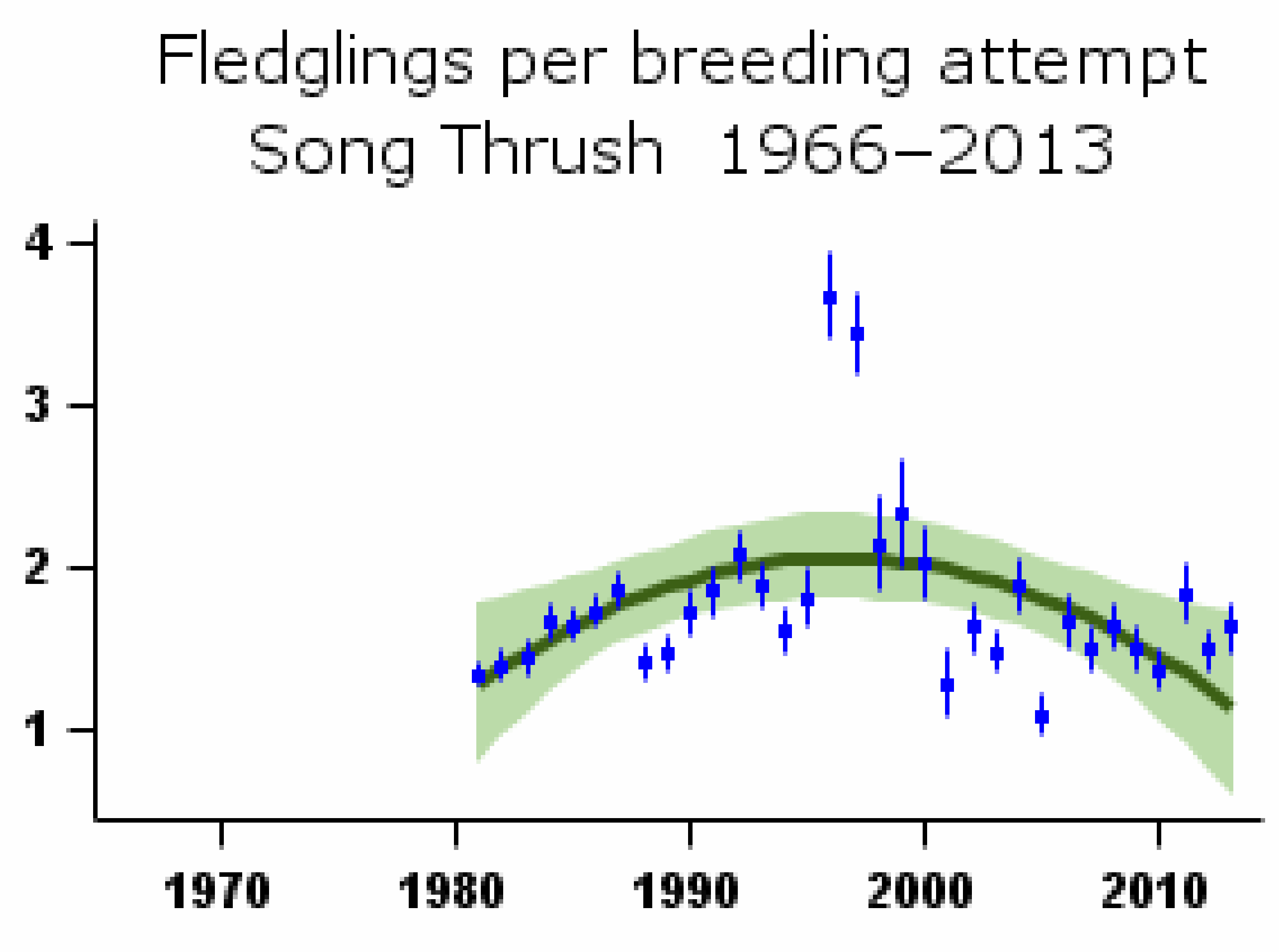
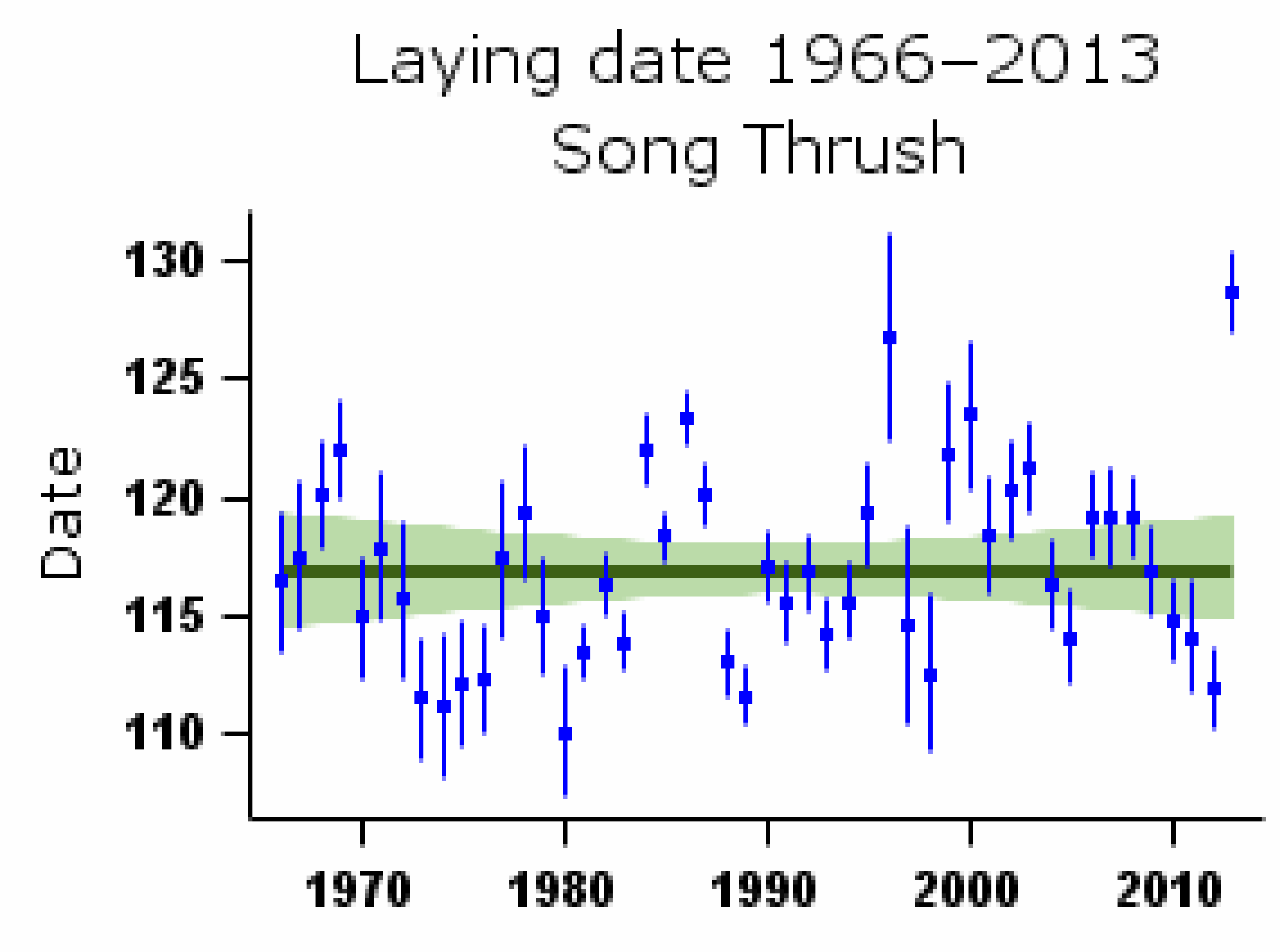


Habitat graph

Demographic trends



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

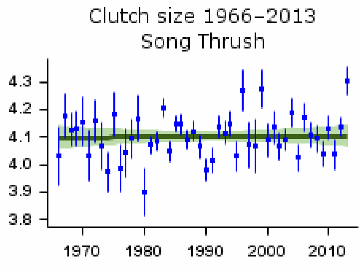


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

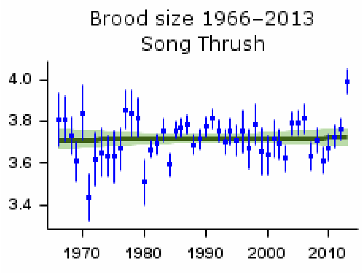
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	31	1981-2012	226	Curvilinear	1.27 fledglings	1.24 fledglings	-2.3%		
Clutch size	44	1968-2012	173	None					
Brood size	44	1968-2012	190	None					
Nest failure rate at egg stage	31	1981-2012	309	Curvilinear	4.28% nests/day	4.59% nests/day	7.2%		
Nest failure rate at chick stage	31	1981-2012	226	Curvilinear	2.57% nests/day	2.35% nests/day	-8.6%		
Laying date	44	1968-2012	198	None			0 days		
Juvenile to Adult ratio (CES)	28	1984-2012	91	Smoothed trend	170 Index value	100 Index value	-41%	>25	
Juvenile to Adult ratio (CES)	25	1987-2012	96	Smoothed trend	106 Index value	100 Index value	-6%		
Juvenile to Adult ratio (CES)	10	2002-2012	100	Smoothed trend	117 Index value	100 Index value	-15%		
Juvenile to Adult ratio (CES)	5	2007-2012	97	Smoothed trend	106 Index value	100 Index value	-6%		

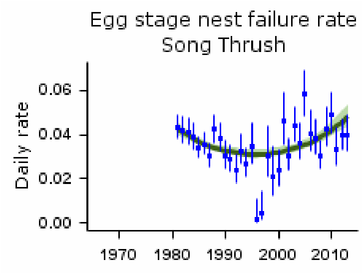
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



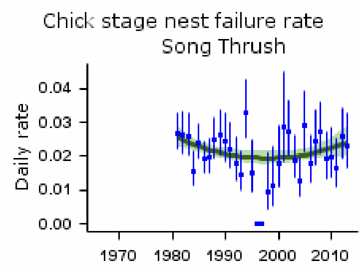
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



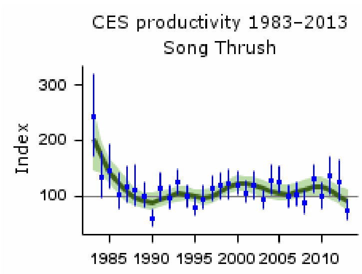
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



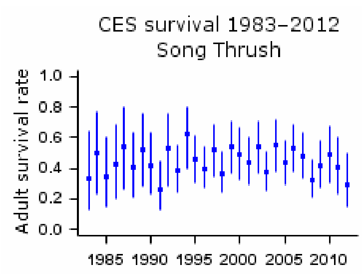
Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



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 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 have contributed to the population decline (Thomson et al. 1997, Siriwardena et al. 1998, Robinson et al. 2004). A more recent integrated analysis also indicated that post-fledging survival also made some contribution to annual population changes (Robinson et al. 2014).

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 possible 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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Mistle Thrush

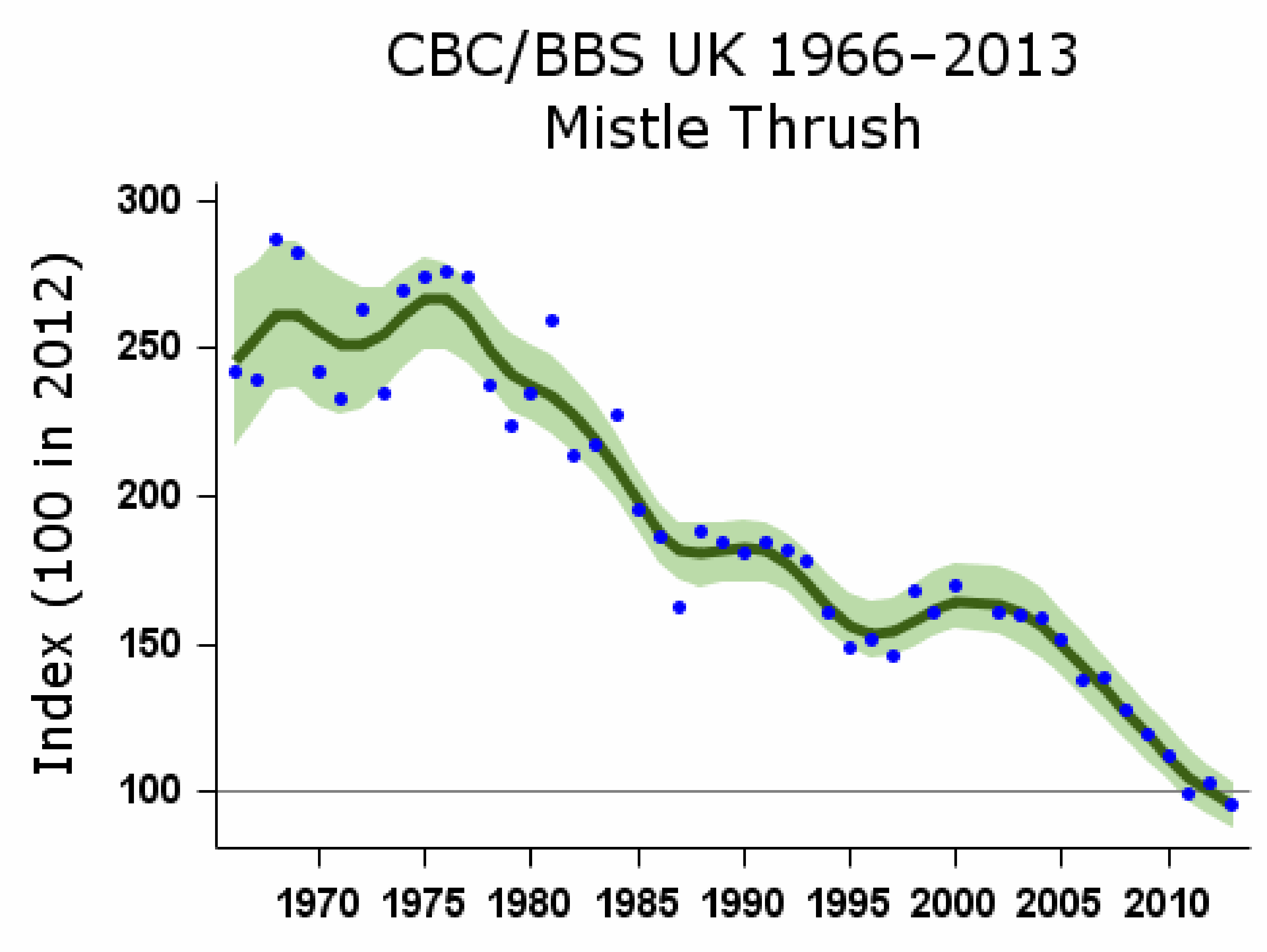
Turdus viscivorus

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. 1998a). Numbers have shown a widespread moderate decline across Europe since 1980, though with little change since 1985 (PECBMS 2014a).



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	45	1967-2012	568	-61	-68	-53	>50	
	25	1987-2012	901	-45	-52	-37	>25	
	10	2002-2012	1283	-39	-43	-35	>25	
	5	2007-2012	1342	-26	-30	-22	>25	
CBC/BBS England	45	1967-2012	461	-63	-69	-56	>50	
	25	1987-2012	724	-51	-56	-43	>50	

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	10	2002-2012	1013	-40	-44	-37	>25	
	5	2007-2012	1063	-25	-28	-22	>25	
BBS UK	17	1995-2012	1181	-34	-39	-29	>25	
	10	2002-2012	1283	-38	-41	-34	>25	
	5	2007-2012	1342	-25	-29	-21	>25	
BBS England	17	1995-2012	940	-42	-46	-38	>25	
	10	2002-2012	1013	-40	-43	-37	>25	
	5	2007-2012	1063	-25	-28	-22		
BBS Scotland	17	1995-2012	77	-18	-42	10		
	10	2002-2012	86	-47	-59	-32	>25	
	5	2007-2012	98	-34	-47	-21	>25	
BBS Wales	17	1995-2012	101	-1	-24	29		
	10	2002-2012	112	-13	-26	2		
	5	2007-2012	110	-11	-24	2		
BBS N.Ireland	17	1995-2012	59	-17	-59	46		
	10	2002-2012	70	-41	-52	-29	>25	
	5	2007-2012	69	-30	-41	-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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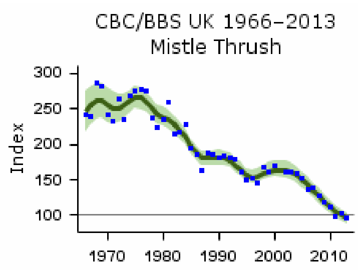
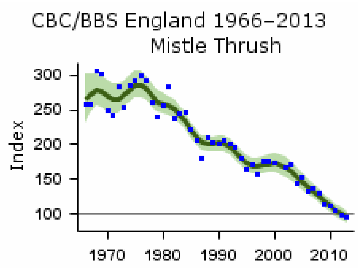


CBC/BBS UK graph



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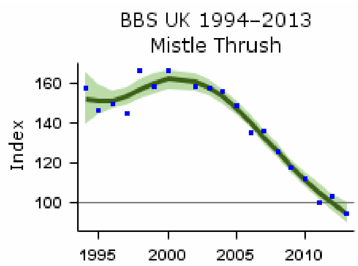
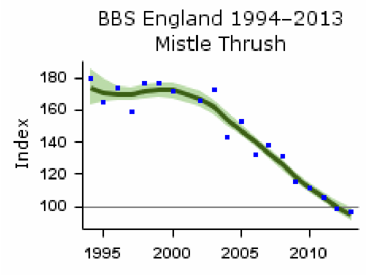


BBS UK graph



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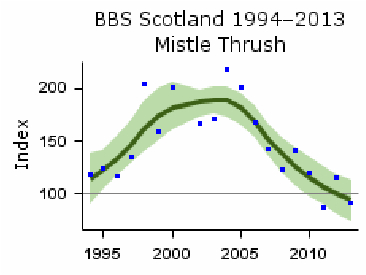

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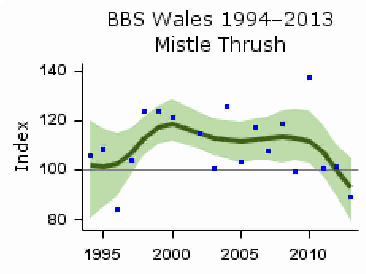

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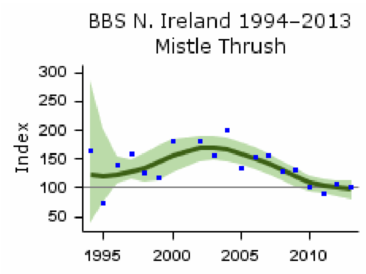
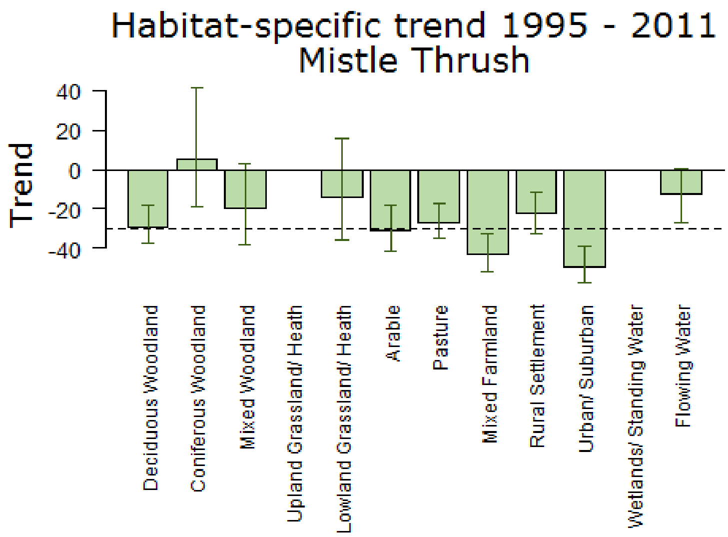


BBS N.Ireland graph

Population trends by habitat



Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	234	-29	-38	-18
Coniferous Woodland	16	1995-2011	69	5	-19	42
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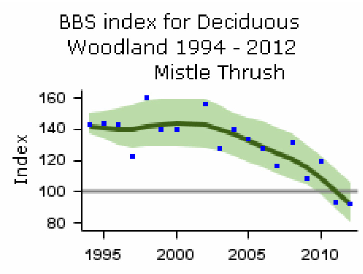
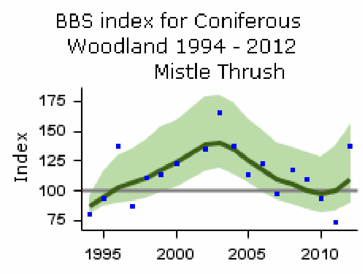
Lowland Grassland/ Heath	16	1995-2011	58	-14	-36	16
Arable	16	1995-2011	180	-31	-41	-18
Pasture	16	1995-2011	441	-27	-36	-17
Mixed Farmland	16	1995-2011	160	-43	-52	-33
Rural Settlement	16	1995-2011	262	-22	-32	-11
Urban/ Suburban	16	1995-2011	143	-50	-57	-39
Flowing Water	16	1995-2011	122	-12	-27	0

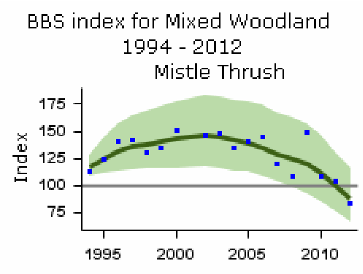
Further information on habitat-specific trends, please follow link here.



Habitat graph

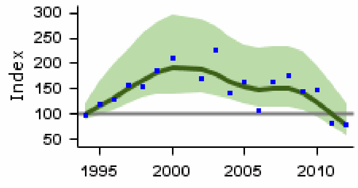


Habitat graph



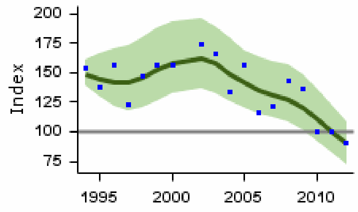
Habitat graph

BBS index for Lowland Grass/heath 1994 - 2012
Mistle Thrush



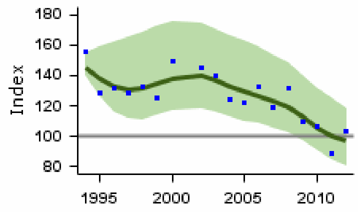
Habitat graph

BBS index for Arable 1994 - 2012
Mistle Thrush



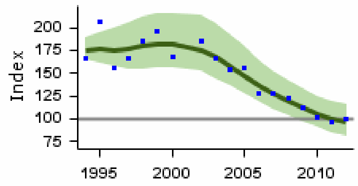
Habitat graph

BBS index for Pasture 1994 - 2012
Mistle Thrush



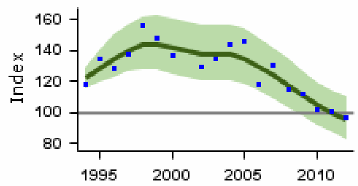
Habitat graph

BBS index for Mixed Farmland 1994 - 2012
Mistle Thrush



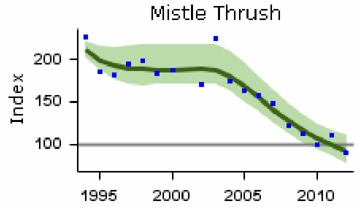
Habitat graph

BBS index for Rural Settlement 1994 - 2012
Mistle Thrush

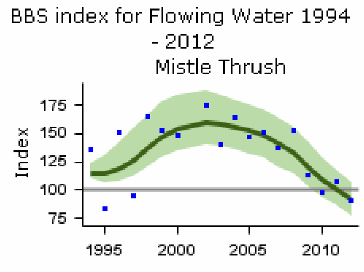


Habitat graph

BBS index for Urban/ Suburban 1994 - 2012
Mistle Thrush

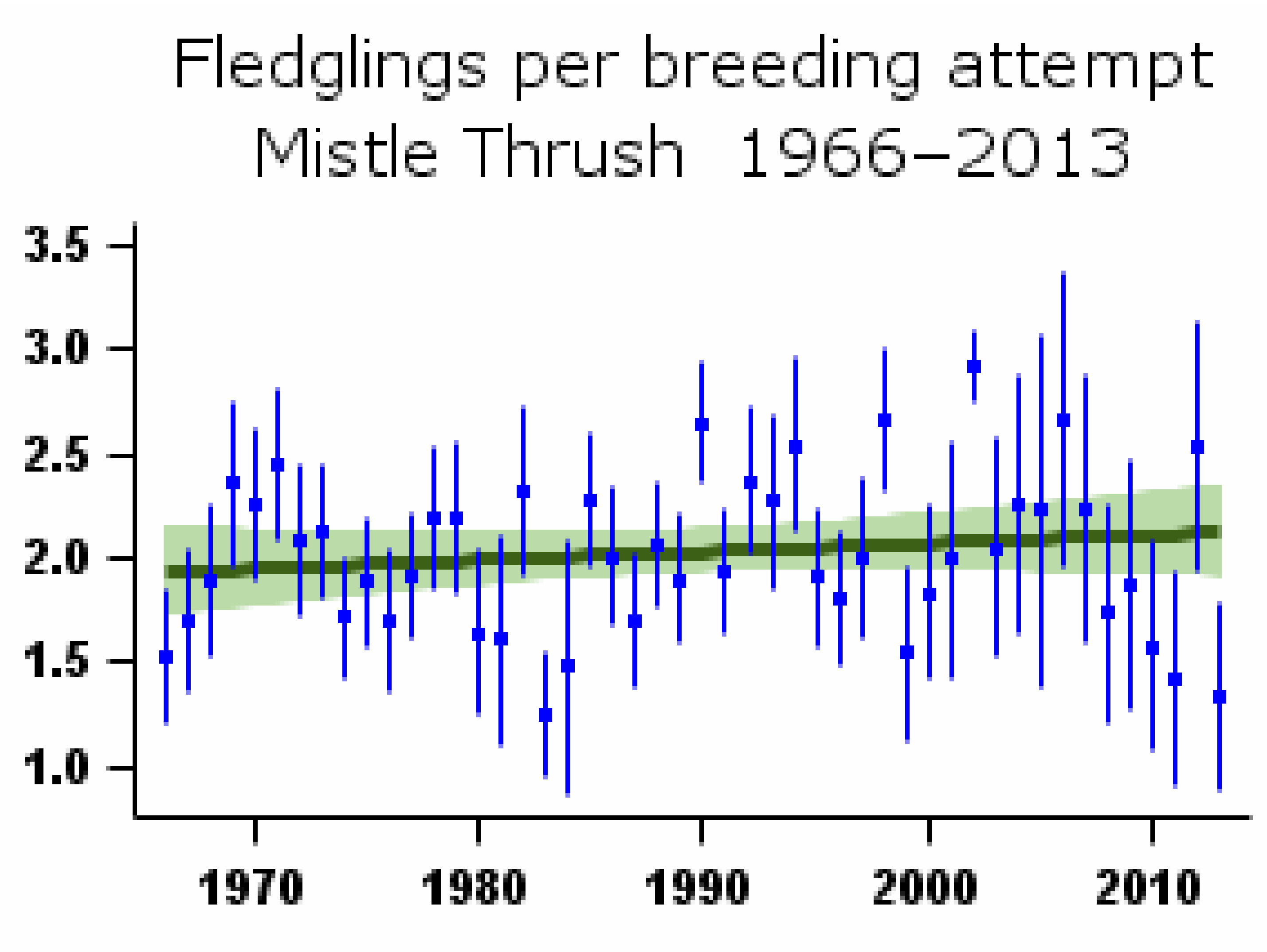


Habitat graph

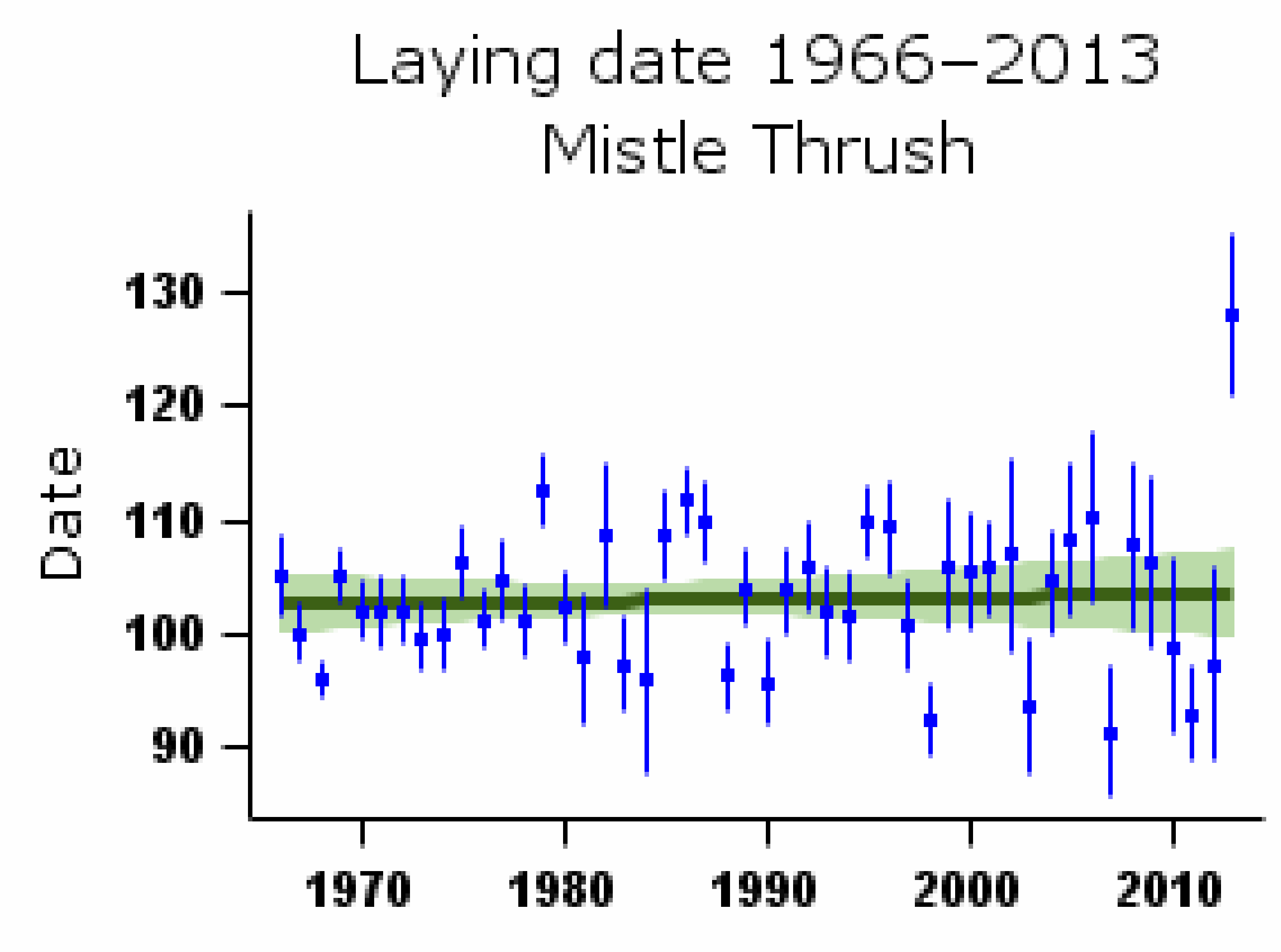


Habitat graph

Demographic trends



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

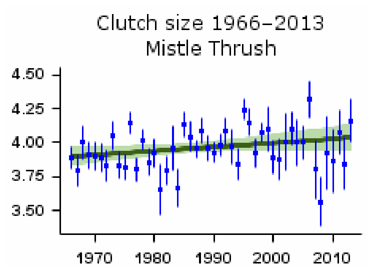


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

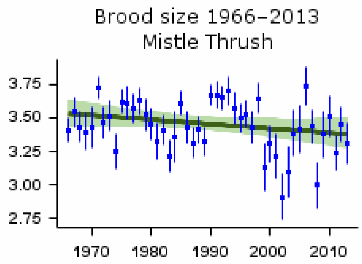
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	51	None					
Clutch size	44	1968-2012	32	None					
Brood size	44	1968-2012	64	None					
Nest failure rate at egg stage	44	1968-2012	53	None					
Nest failure rate at chick stage	44	1968-2012	56	None					
Laying date	44	1968-2012	26	None			0 days		Small sample

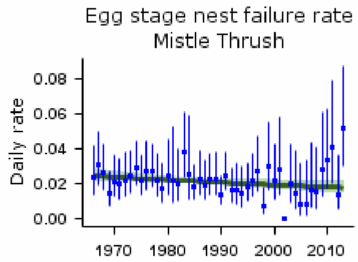
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



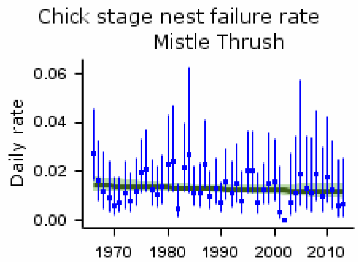
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



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

Declines may be linked to reduced survival of juveniles. The paucity of information specific to Mistle Thrush represents a gap in knowledge that needs to be filled by new research.

Change factor	Primary driver	Secondary driver
Demographic	Decreased juvenile survival	
Ecological	Agricultural intensification	

Further information on causes of change

Similarities in population trends between Mistle Thrush, Robinson et al. 2004), Mistle Thrush decline may be linked to reduced survival of juveniles: both adult and juvenile survival was lower during periods of negative population trend than in stable or increasing ones (Siriwardena et al. 1998a). Demographic data do not suggest any close link between the population trend of Mistle Thrush and its breeding productivity, as there is no evidence of increased failure rates at egg or chick stage, or of reduction in fledglings per breeding attempt.

Mistle Thrush declines recorded by CBC were especially evident on farmland. Drainage of fields and removal of hedgerows would have reduced the habitat available for Mistle Thrush, as they did for Song Thrush (Chamberlain et al. 2000b, Peach et al. 2004).

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Spotted Flycatcher

Muscicapa striata

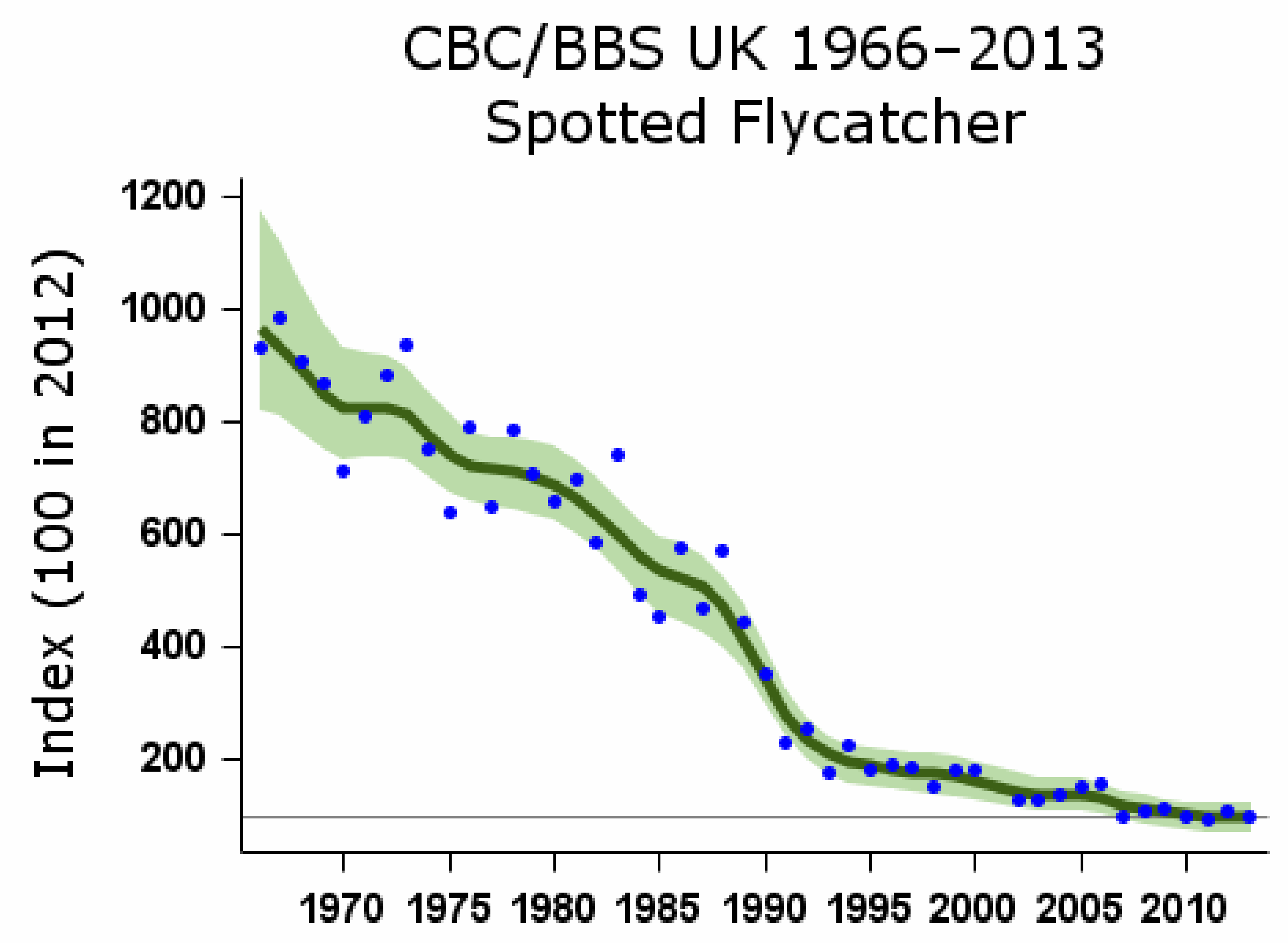
Key facts

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:	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. It is among a suite of species that winter in the humid zone of West Africa and correspondingly are showing the strongest population declines among our migrant species (Ockendon et al. 2012, 2014). 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. Gaps are already starting to appear in the 10-km distribution map, especially in urban areas and close to the east coast (Balmer et al. 2013). Numbers have shown a widespread moderate decline across Europe since 1980, though with little change since 1995 (PECBMS 2014a).



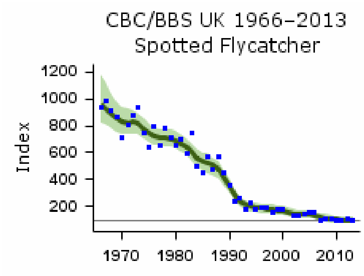
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

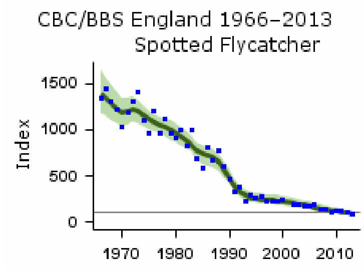
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	45	1967-2012	129	-89	-94	-85	>50	
	25	1987-2012	165	-80	-86	-75	>50	
	10	2002-2012	186	-31	-48	-12	>25	
	5	2007-2012	176	-17	-32	-7		
CBC/BBS England	45	1967-2012	97	-93	-95	-89	>50	
	25	1987-2012	119	-86	-89	-80	>50	
	10	2002-2012	130	-51	-59	-43	>50	
	5	2007-2012	124	-32	-42	-22	>25	
BBS UK	17	1995-2012	194	-49	-62	-39	>25	
	10	2002-2012	186	-30	-48	-14	>25	
	5	2007-2012	176	-16	-31	-5		
BBS England	17	1995-2012	137	-63	-71	-54	>50	
	10	2002-2012	130	-51	-61	-40	>50	
	5	2007-2012	124	-32	-42	-22	>25	

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

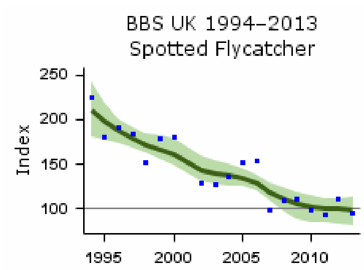
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



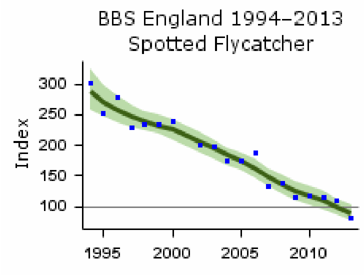
CBC/BBS UK graph



CBC/BBS England graph

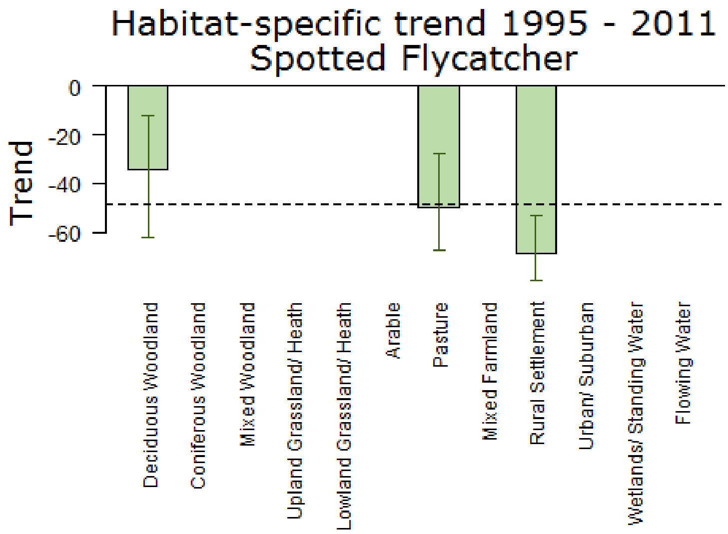


BBS UK graph



BBS England graph

Population trends by habitat



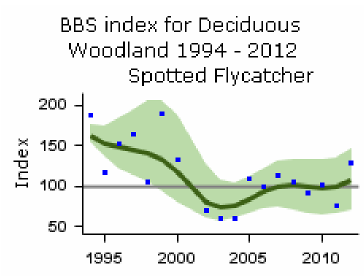
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

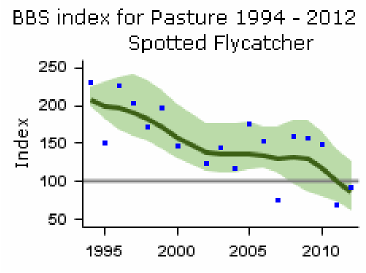
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	41	-34	-62	-13
Pasture	16	1995-2011	79	-50	-67	-28
Rural Settlement	16	1995-2011	53	-68	-79	-53

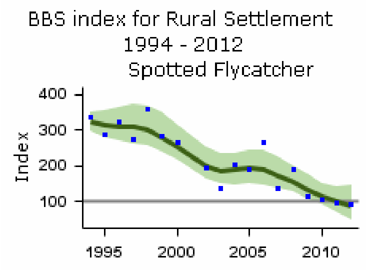
Further information on habitat-specific trends, please follow link here.



Habitat graph

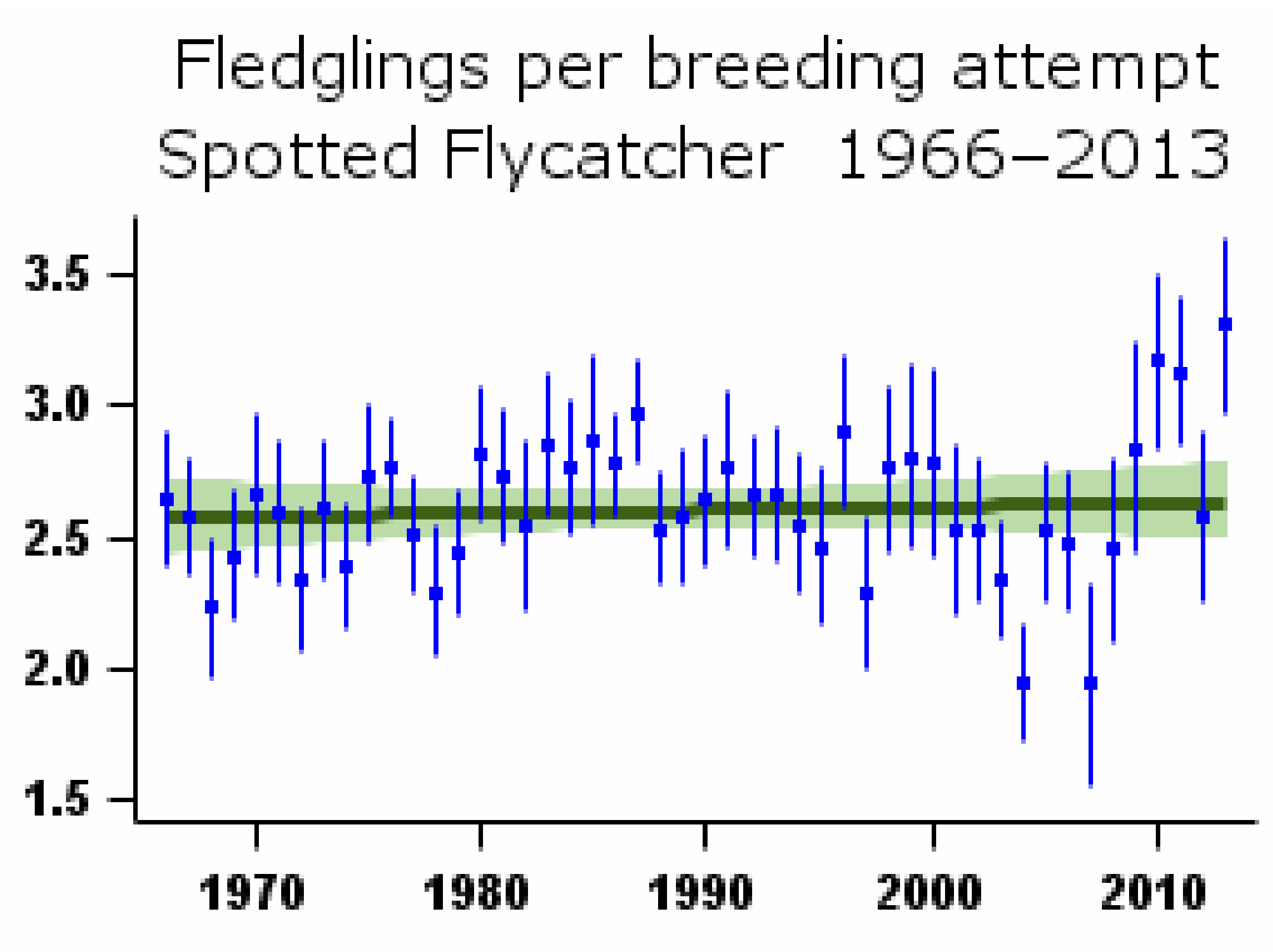


Habitat graph

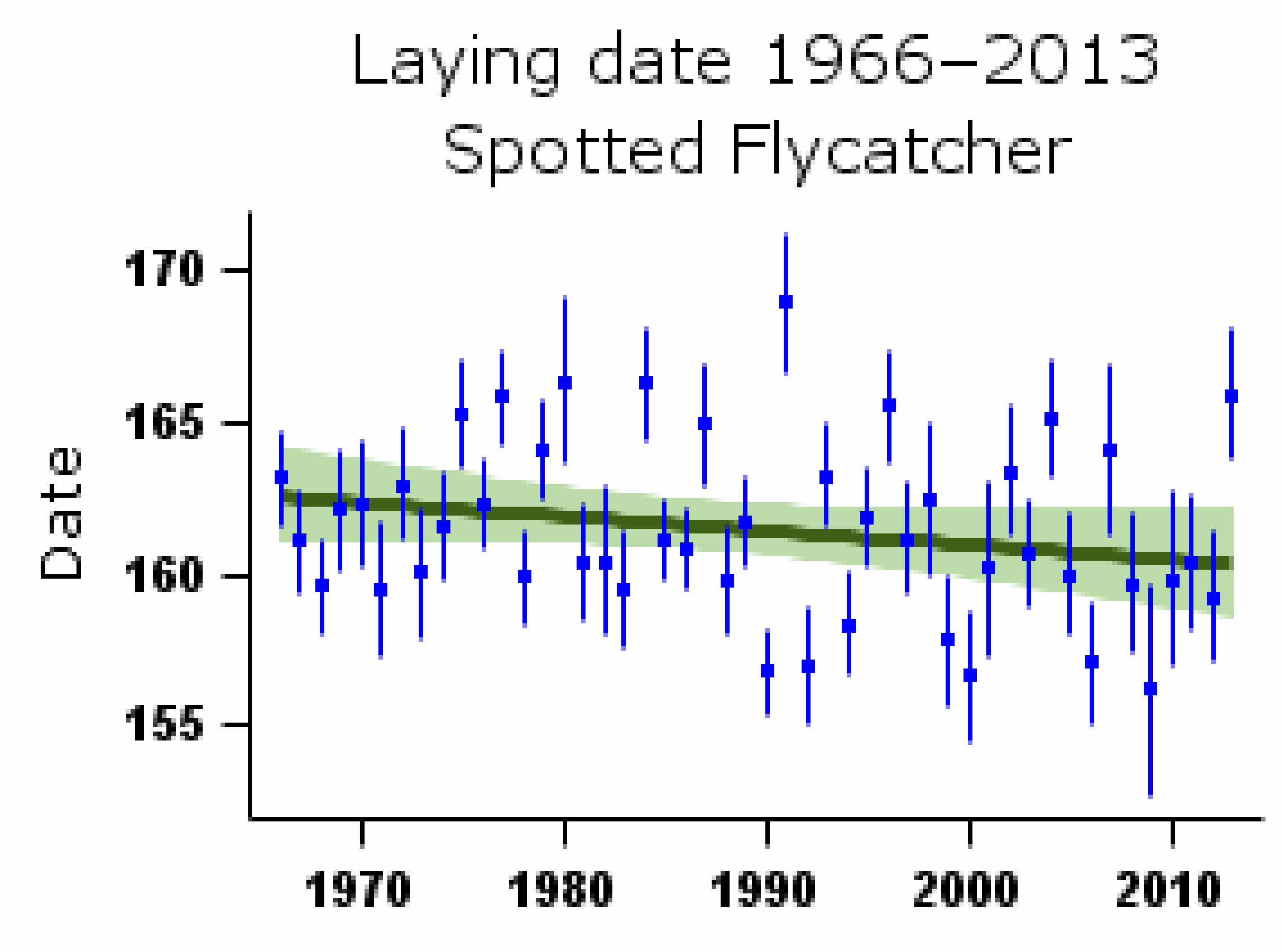


Habitat graph

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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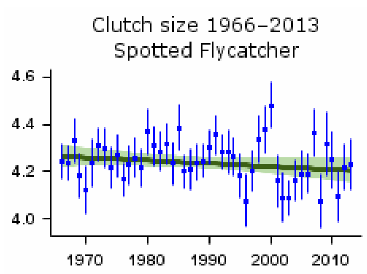
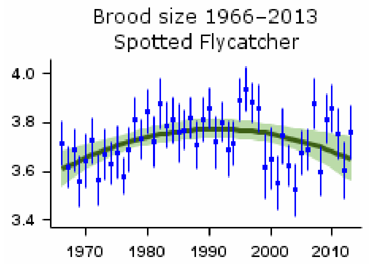
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	102	None					
Clutch size	44	1968-2012	78	None					
Brood size	44	1968-2012	127	Curvilinear	3.63 chicks	3.66 chicks	0.8%		
Nest failure rate at egg stage	44	1968-2012	115	Curvilinear	1.76% nests/day	1.57% nests/day	-10.8%		
Nest failure rate at chick stage	44	1968-2012	103	None					
Laying date	44	1968-2012	69	None			0 days		

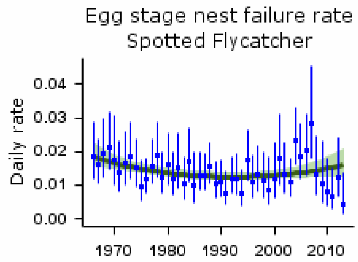
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



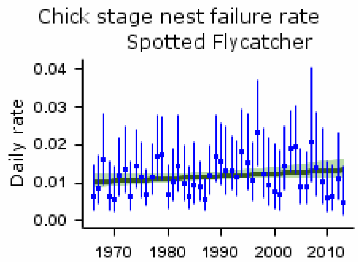
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



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

Nest failure rates have decreased but the number of fledglings per breeding attempt shows no trend. Though samples are too small to continue presenting a trend, there was 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 the 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 ideas.

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 were 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, at least in 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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Robin

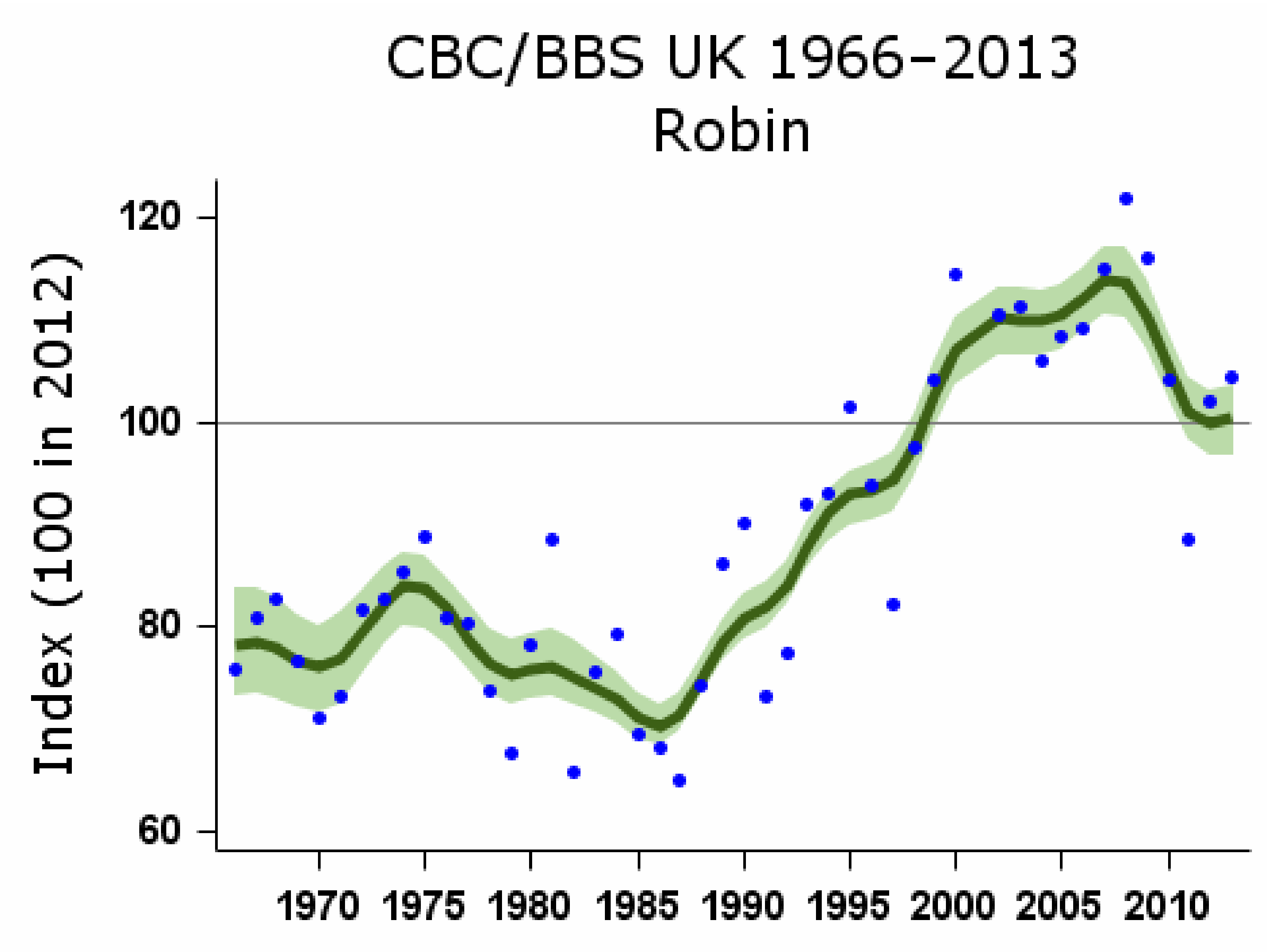
Erithacus rubecula

Key facts

Conservation listings:	Europe: no SPEC category (concentrated in Europe, conservation status favourable) (BiE04) UK: green (BoCC3)
Long-term trend:	UK, England: shallow 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, with a reduction in nest failure rates at the egg stage, although CES productivity measures have been relatively unchanged. Survival rates, as measured by CES, appear stable. 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: numbers have dropped sharply in the last few seasons, but remain relatively high. The BBS PECBMS 2014a).



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

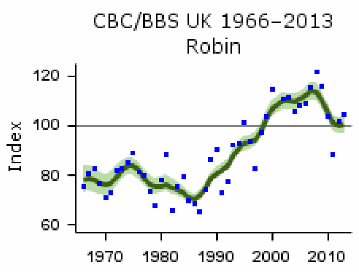
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	45	1967-2012	1093	27	15	42		
	25	1987-2012	1791	40	31	48		
	10	2002-2012	2707	-9	-11	-7		
	5	2007-2012	3019	-12	-14	-10		

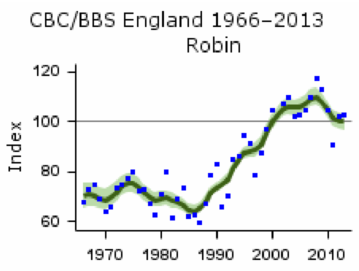
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	45	1967-2012	877	42	27	57		
	25	1987-2012	1428	54	45	61		
	10	2002-2012	2149	-5	-8	-3		
	5	2007-2012	2419	-9	-11	-7		
CES adults	28	1984-2012	94	13	-1	37		
	25	1987-2012	100	16	4	33		
	10	2002-2012	103	-20	-25	-14		
	5	2007-2012	100	-29	-33	-24	>25	
CES juveniles	28	1984-2012	99	0	-27	43		
	25	1987-2012	106	15	-11	54		
	10	2002-2012	108	-14	-24	-3		
	5	2007-2012	107	-21	-30	-11		
BBS UK	17	1995-2012	2390	7	4	11		
	10	2002-2012	2707	-8	-10	-6		
	5	2007-2012	3019	-11	-13	-9		
BBS England	17	1995-2012	1895	13	10	17		
	10	2002-2012	2149	-4	-7	-2		
	5	2007-2012	2419	-8	-10	-7		
BBS Scotland	17	1995-2012	199	8	-5	19		
	10	2002-2012	222	-6	-15	4		
	5	2007-2012	259	-15	-21	-8		
BBS Wales	17	1995-2012	194	-17	-24	-8		
	10	2002-2012	217	-26	-31	-20	>25	
	5	2007-2012	214	-21	-26	-15		
BBS N.Ireland	17	1995-2012	89	-1	-18	16		
	10	2002-2012	103	-19	-27	-12		
	5	2007-2012	109	-18	-23	-11		

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

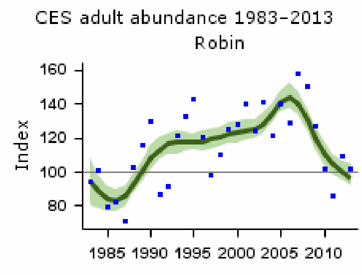
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



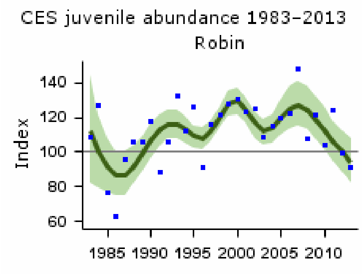
CBC/BBS UK graph



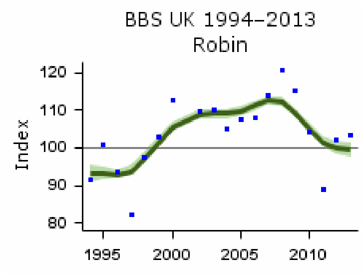
CBC/BBS England graph



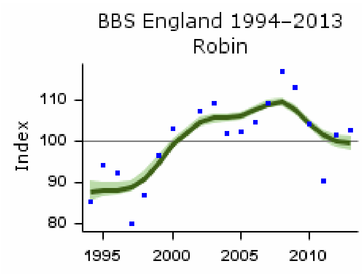
CES adults graph



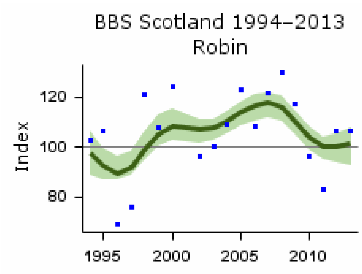
CES juveniles graph



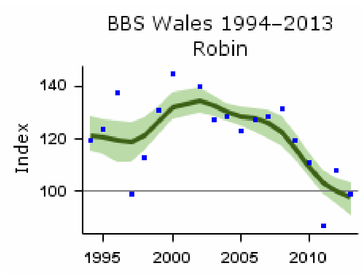
BBS UK graph



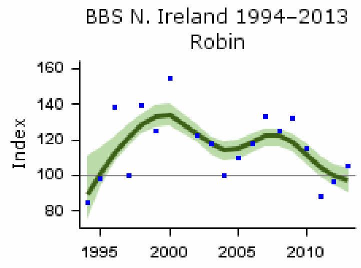
BBS England graph



BBS Scotland graph

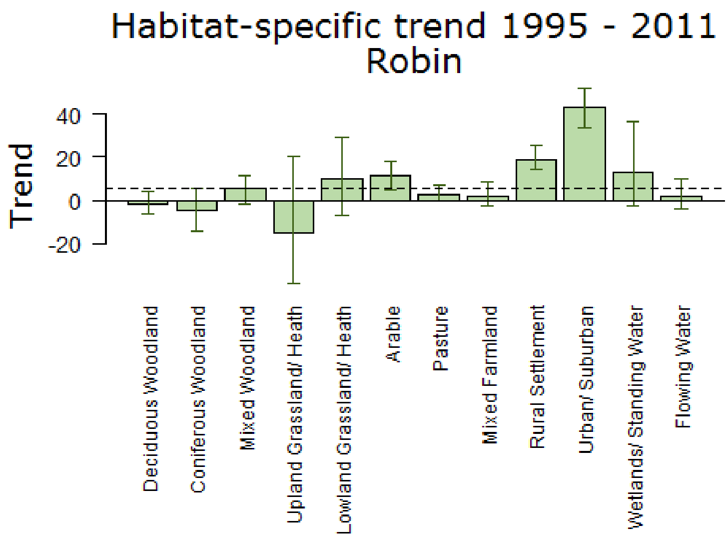


BBS Wales graph



BBS N.Ireland graph

Population trends by habitat



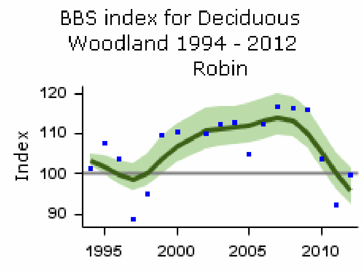
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

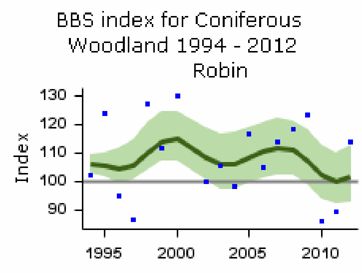
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	897	-2	-6	4
Coniferous Woodland	16	1995-2011	247	-5	-14	6
Mixed Woodland	16	1995-2011	491	5	-2	12
Upland Grassland/ Heath	16	1995-2011	40	-15	-38	20
Lowland Grassland/ Heath	16	1995-2011	179	10	-7	29
Arable	16	1995-2011	717	12	5	18
Pasture	16	1995-2011	1276	3	0	7
Mixed Farmland	16	1995-2011	669	2	-3	9
Rural Settlement	16	1995-2011	855	19	14	25
Urban/ Suburban	16	1995-2011	422	43	34	52
Wetlands/ Standing Water	16	1995-2011	96	13	-2	37
Flowing Water	16	1995-2011	500	2	-4	10

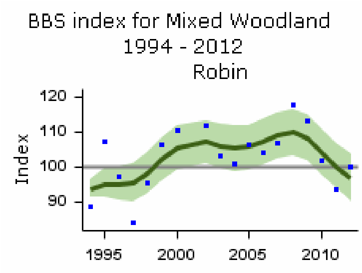
Further information on habitat-specific trends, please follow link here.



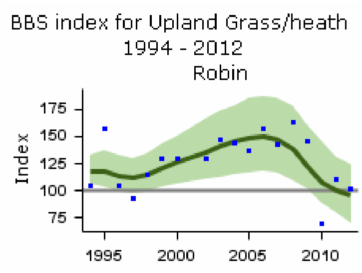
Habitat graph



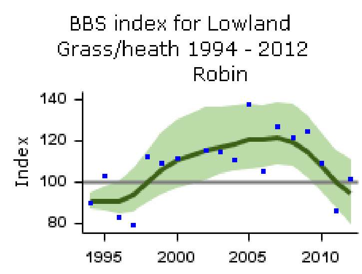
Habitat graph



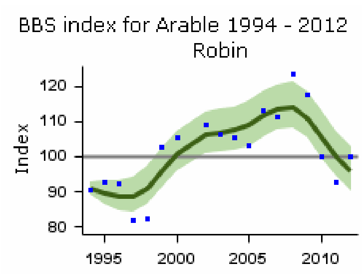
Habitat graph



Habitat graph

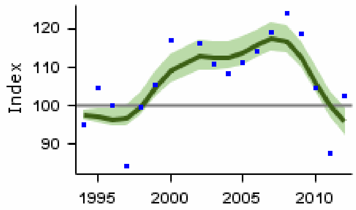


Habitat graph



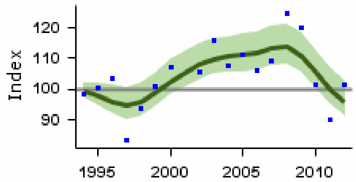
Habitat graph

BBS index for Pasture 1994 - 2012
Robin



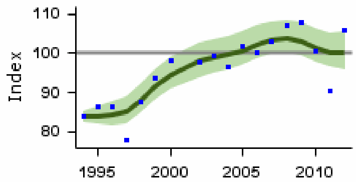
Habitat graph

BBS index for Mixed Farmland 1994 - 2012
Robin



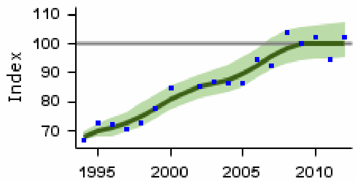
Habitat graph

BBS index for Rural Settlement 1994 - 2012
Robin



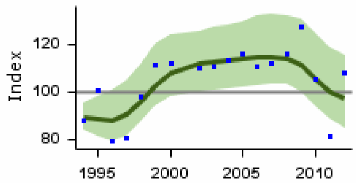
Habitat graph

BBS index for Urban/ Suburban 1994 - 2012
Robin



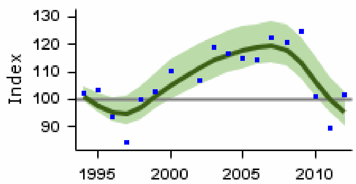
Habitat graph

BBS index for Wetlands 1994 - 2012
Robin



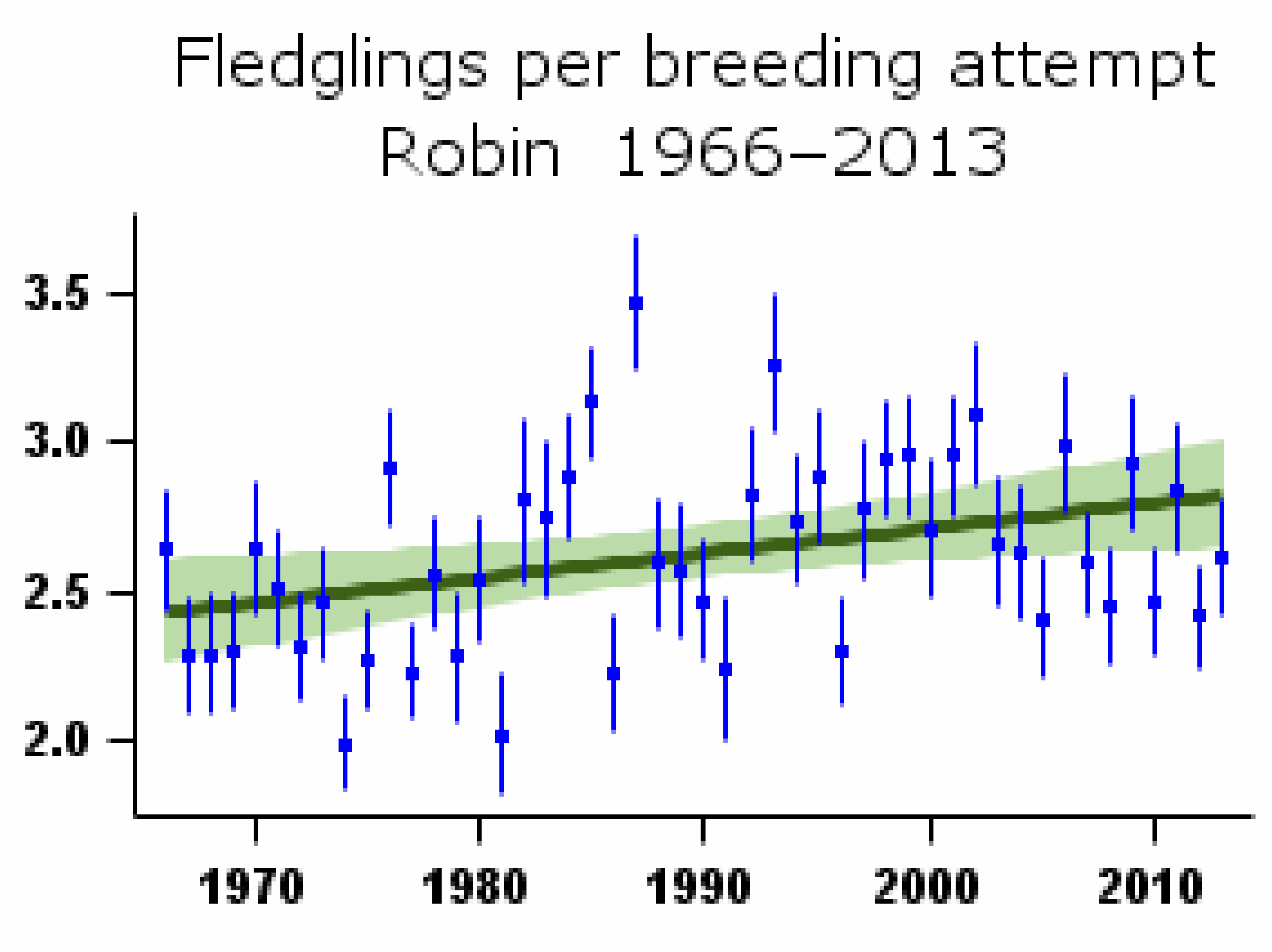
Habitat graph

BBS index for Flowing Water 1994 - 2012
Robin

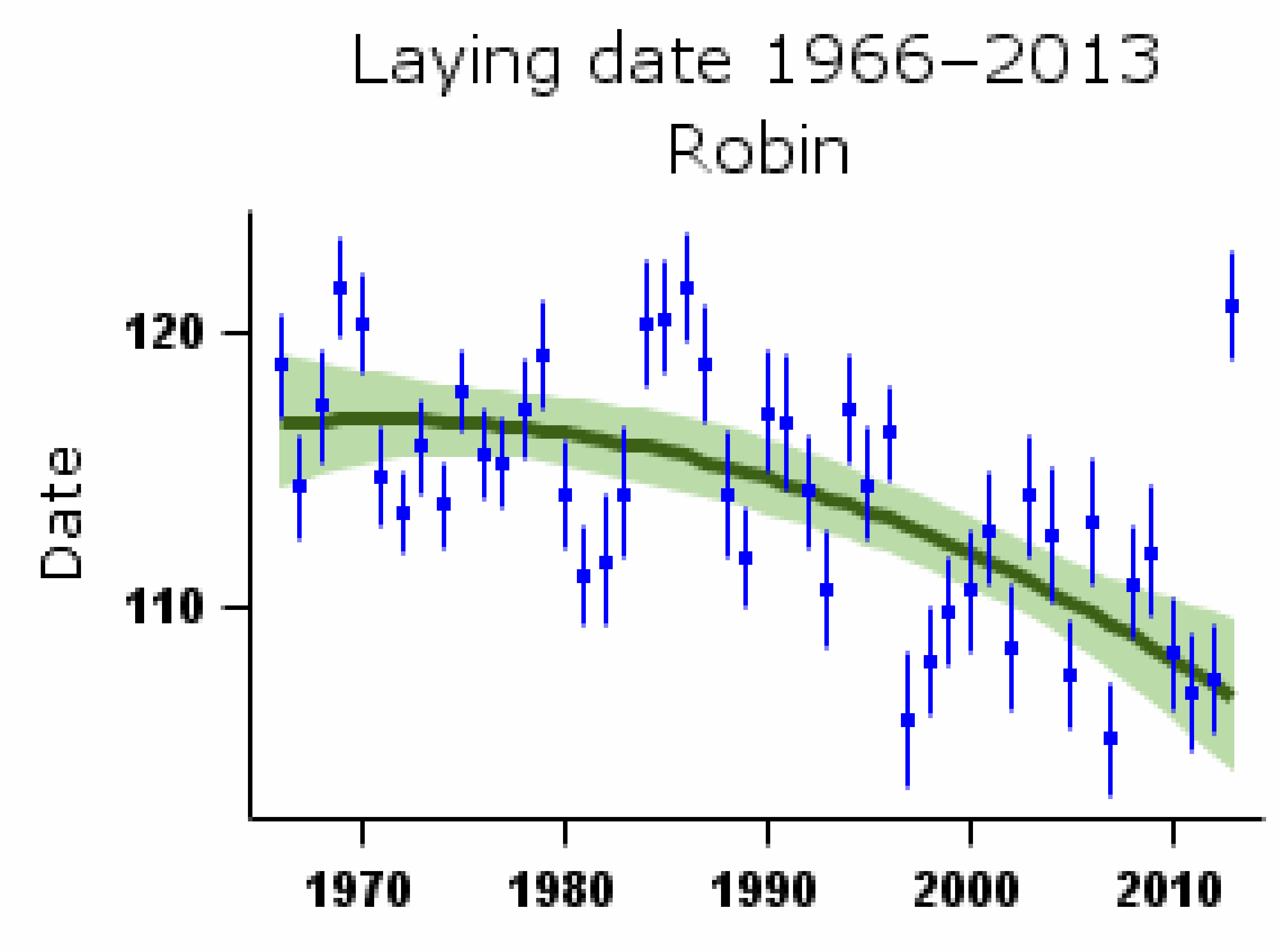


Habitat graph

Demographic trends



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

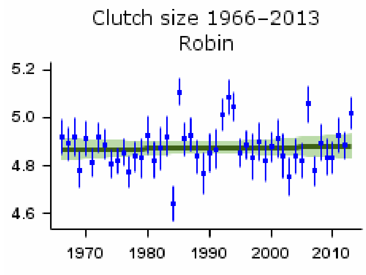


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

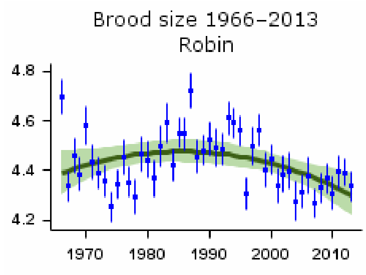
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	207	Linear increase	2.45 fledglings	2.82 fledglings	15.1%		
Clutch size	44	1968-2012	155	None					
Brood size	44	1968-2012	231	Curvilinear	4.41 chicks	4.32 chicks	-2.1%		
Nest failure rate at egg stage	44	1968-2012	228	Curvilinear	2.40% nests/day	1.33% nests/day	-44.6%		
Nest failure rate at chick stage	44	1968-2012	209	None					
Laying date	44	1968-2012	149	Curvilinear	Apr 27	Apr 17	-10 days		
Juvenile to Adult ratio (CES)	28	1984-2012	103	Smoothed trend	102 Index value	100 Index value	-2%		
Juvenile to Adult ratio (CES)	25	1987-2012	109	Smoothed trend	117 Index value	100 Index value	-15%		
Juvenile to Adult ratio (CES)	10	2002-2012	111	Smoothed trend	92 Index value	100 Index value	8%		
Juvenile to Adult ratio (CES)	5	2007-2012	110	Smoothed trend	94 Index value	100 Index value	6%		

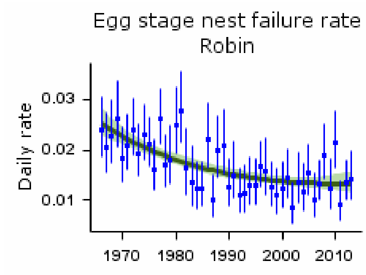
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



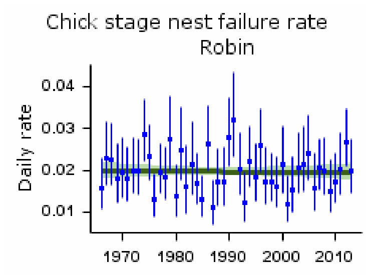
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



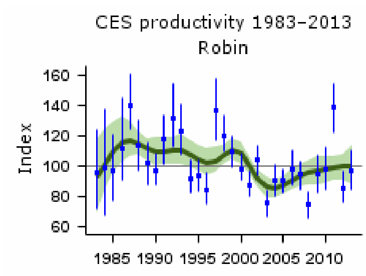
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



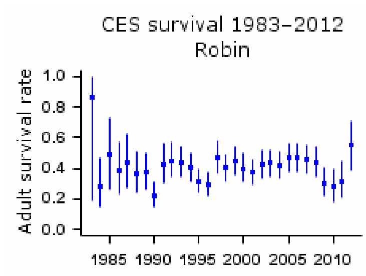
Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



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

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. 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); preliminary estimate of approximately 6,000 males in 2012 (BTO Nightingale Survey 2012-13, in prep)

Status summary

The national survey of Nightingales organised by BTO in 1999 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 Holt et al. 2012b), the BBS trend has fallen steeply and CES suggests a probable decline. Results from a new Nightingale Survey across Britain in 2012-13 (for more details Balmer et al. 2013). 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. It is among a suite of species that winter in the humid zone of West Africa and correspondingly are showing the strongest population declines among our migrant species (Ockendon et al. 2012, 2014).

Nightingale shows a moderate decline overall across Europe since 1980, though with very little change since 1984 (PECBMS 2014a); this overall trend masks a stark contrast between severe decreases in southern and western Europe and increases in the east of the range (PECBMS 2007).

Smoothed population index, relative to an arbitrary 100 in 2013, with 85% confidence limits in green

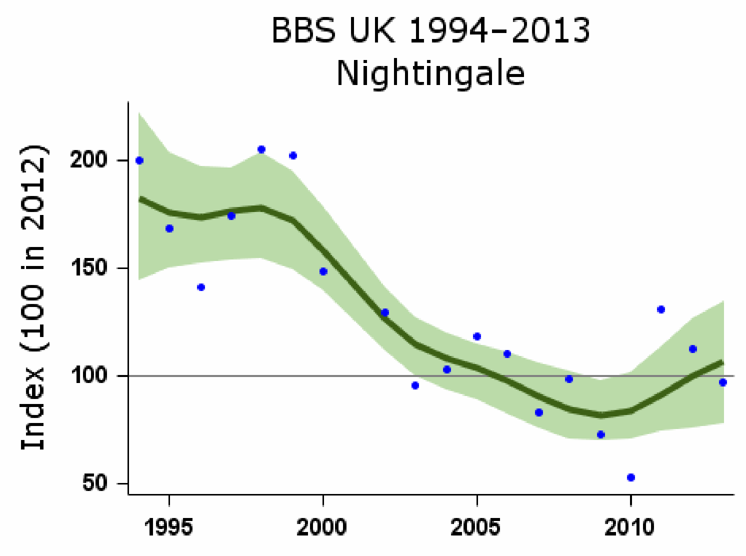
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	17	1995-2012	33	-43	-62	-19	>25	
	10	2002-2012	34	-21	-45	9		
	5	2007-2012	38	10	-17	46		
BBS England	17	1995-2012	32	-41	-58	-9	>25	
	10	2002-2012	34	-21	-40	10		
	5	2007-2012	38	8	-15	50		

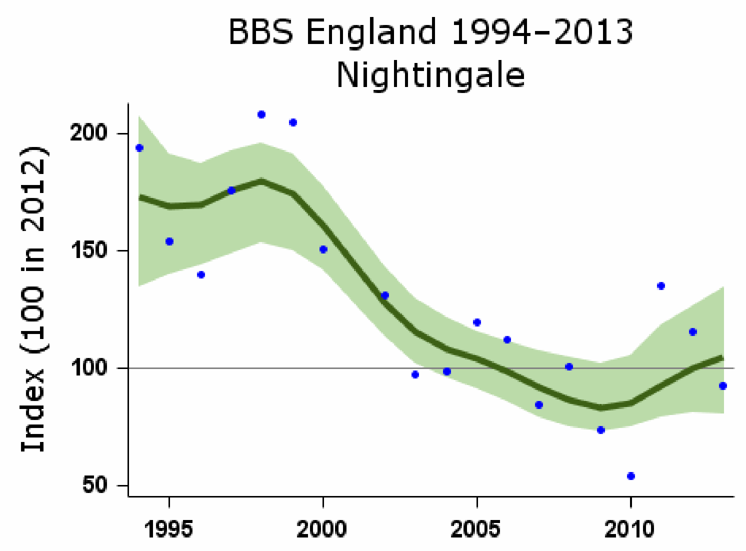
Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

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

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

Causes of change

There is strong evidence that deer grazing is having a negative effect on Nightingale numbers. Conditions on the wintering grounds, such as changes in habitat, are also likely to have carry-over effects into the breeding season. Several studies have highlighted the benefit of habitat management for this species, involving coppicing and control of deer numbers to promote the heterogeneous vegetation structure that Nightingales need.

Change factor	Primary driver	Secondary driver
Demographic	Unknown	
Ecological	Changes in woodland	Changes on wintering grounds

Further information on causes of change

Several hypotheses have been put forward to explain Nightingale decline and are the subject of ongoing BTO research: these include reduction in coppicing, maturing of scrubland and conifer plantation, an increase in deer and their browsing pressure, higher predation pressure, reduced food quality, pressures on migration and deterioration of conditions on the wintering grounds (Fuller et al. 1999, 2005). Wintering habitat of British birds is being investigated by fitting geolocators to Nightingales (Holt et al. 2012b). Habitat deterioration on the wintering grounds may result in greater winter mortality or in birds arriving on the breeding grounds in poor condition

(Ockendon et al. 2012). The potential roles of predation and reduced food quality have been little studied (Holt et al. 2012b). There is strong evidence, however, that increased browsing by deer has had a negative effect on Nightingale numbers.

Nesting Nightingales typically require closed-canopy scrub or young woodland, with bare ground under the canopy for feeding, but also area of low thick vegetation, generally associated with secondary succession and early regeneration after coppicing (Hewson et al. 2005, Wilson et al. 2005b). Canopy height in territories occupied by Nightingales is usually less than four metres in height (Wilson et al. 2005b). A study based in Cambridgeshire found that territory distribution peaked on areas where scrub height varied between three and five metres (Holt et al. 2012c). Nests are built on or close to the ground, in a thick field layer that will provide cover for nests and a refuge for newly fledged young. Scrub structure seems more important that its species composition, and the ideal habitat is probably a dome of increasing vegetation heights, with a crown of vegetation dense enough at the centre to create bare ground underneath, and a gradient of ground-cover towards the edges where the species can nest (Wilson et al. 2005b).

The structural diversity of woodland can be readily reduced by suspending coppicing and rotational cutting, as well as by increased grazing pressure from deer (Fuller et al. 1999). A study based on BBS results from 1995 to 2006 found a negative correlation between the abundance of deer and Nightingales at a regional level, with the species declining the most where deer population increase had been greatest, and modelling suggested that deer alone could have caused a decline of 14% in Nightingales over this period (Newson et al. 2012). Experimental approaches have demonstrated the effect of deer browsing on Nightingale numbers at site level: an exclusion experiment carried out over nine years found that Nightingale territory density within deer exclosures rose to ten times that of the rest of the wood, while radio-tracked Nightingales spent more time inside the deer exclosures than outside (Holt et al. 2010). Mist-netting confirmed that more Nightingales were present within the exclosures than in control plots, although the sample of birds was small (Holt et al. 2011). These findings fit with results across a wider range of breeding bird species that require low vegetation in woodland (Gill & Fuller 2007).

Woodland-scrub mosaics appear to be important breeding habitats for Nightingales, with implications for conservation practice (Holt et al. 2012c).

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Pied Flycatcher

Ficedula hypoleuca

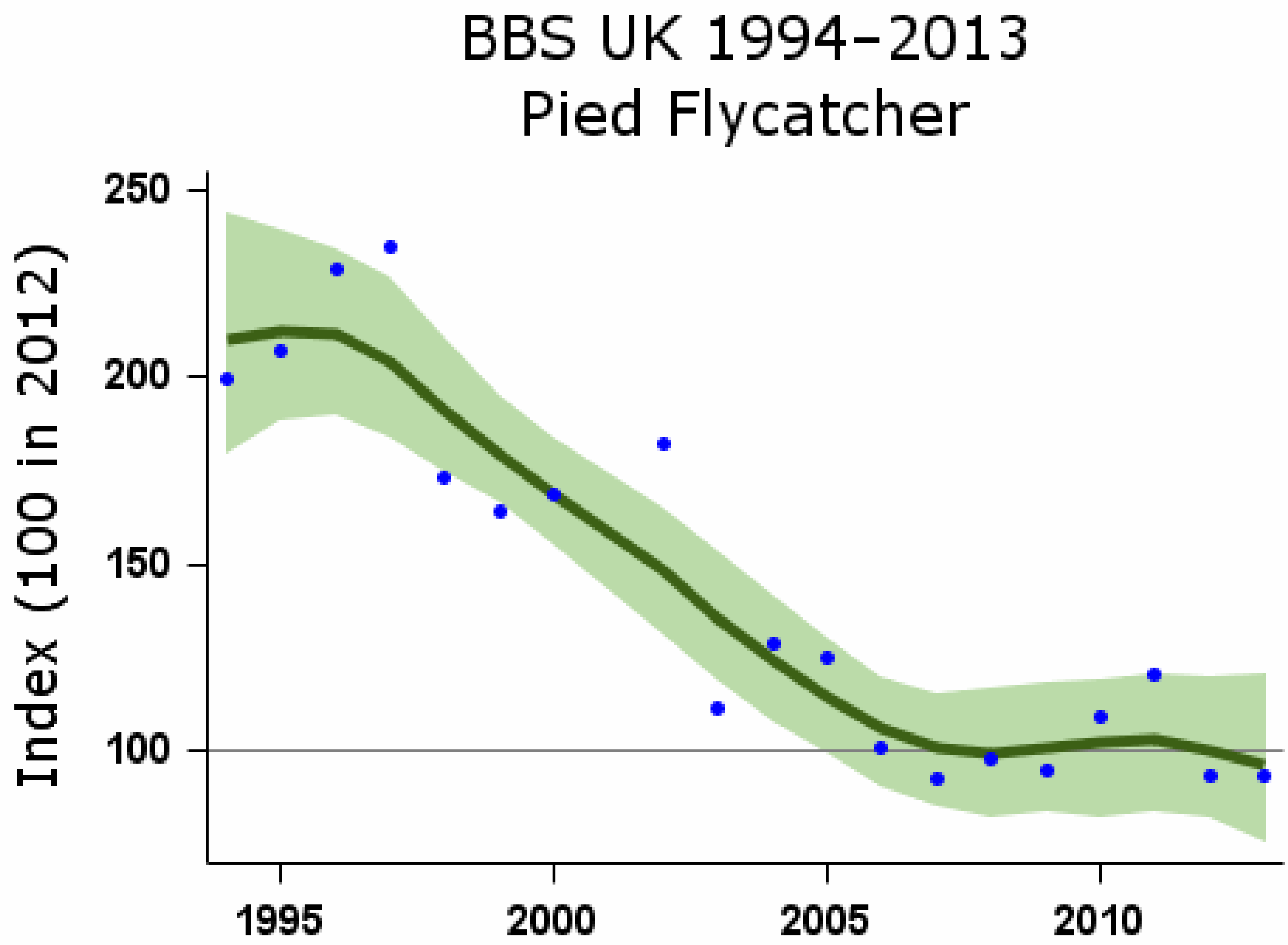
Key facts

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. Nest-box occupancy rates have also fallen over a similar period at a number of sites monitored as RAS projects. Numbers have shown a widespread moderate decline across Europe since 1980 (PECBMS 2014a).



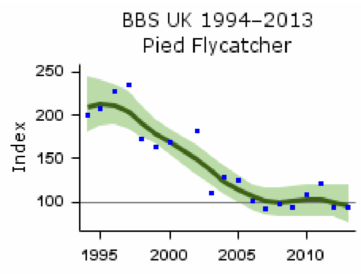
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	17	1995-2012	40	-53	-67	-37	>50	

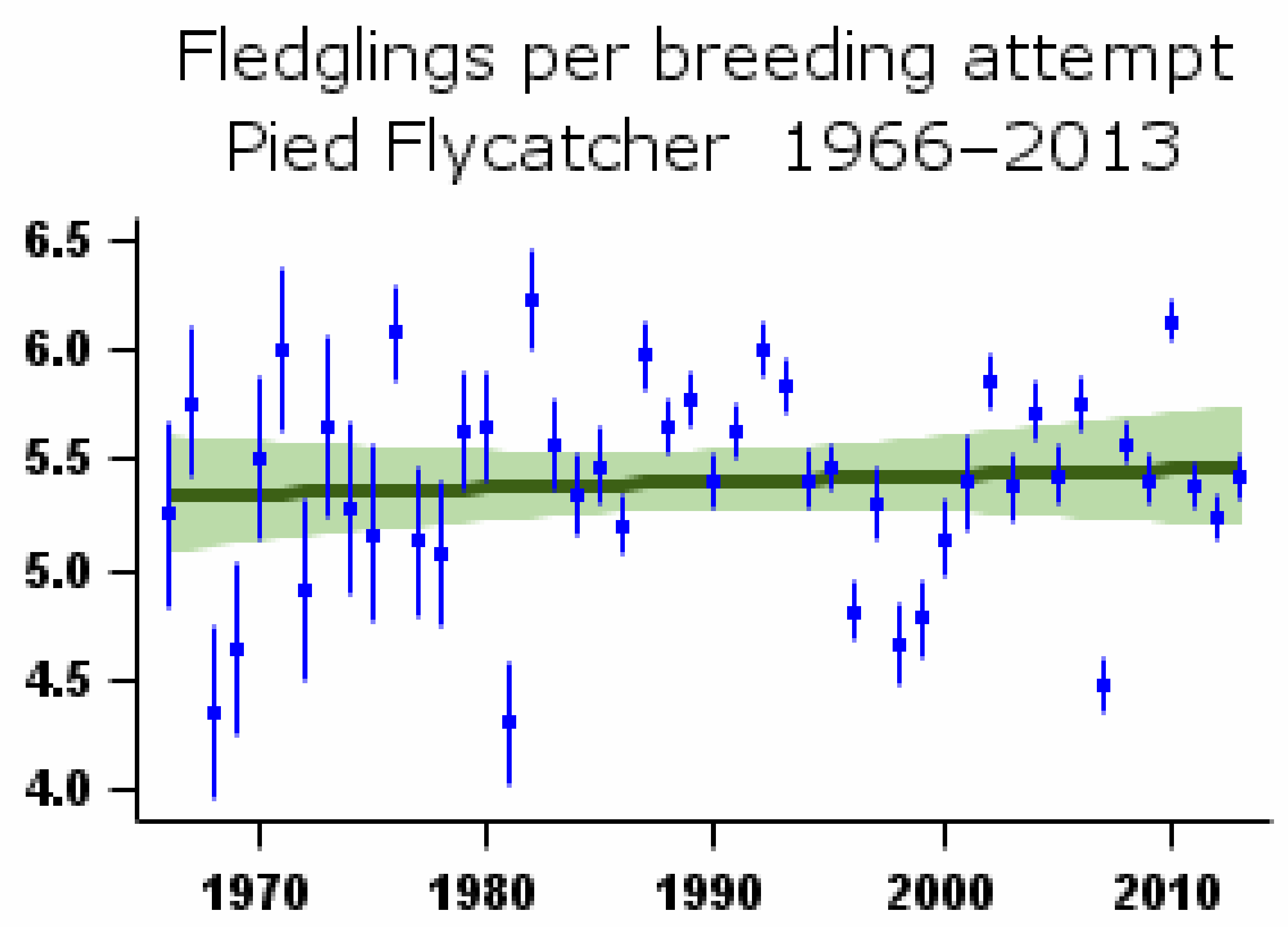
Tables show changes with their 90% confidence limits. Alerts are flagged for significant changes only. See here for more information.

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

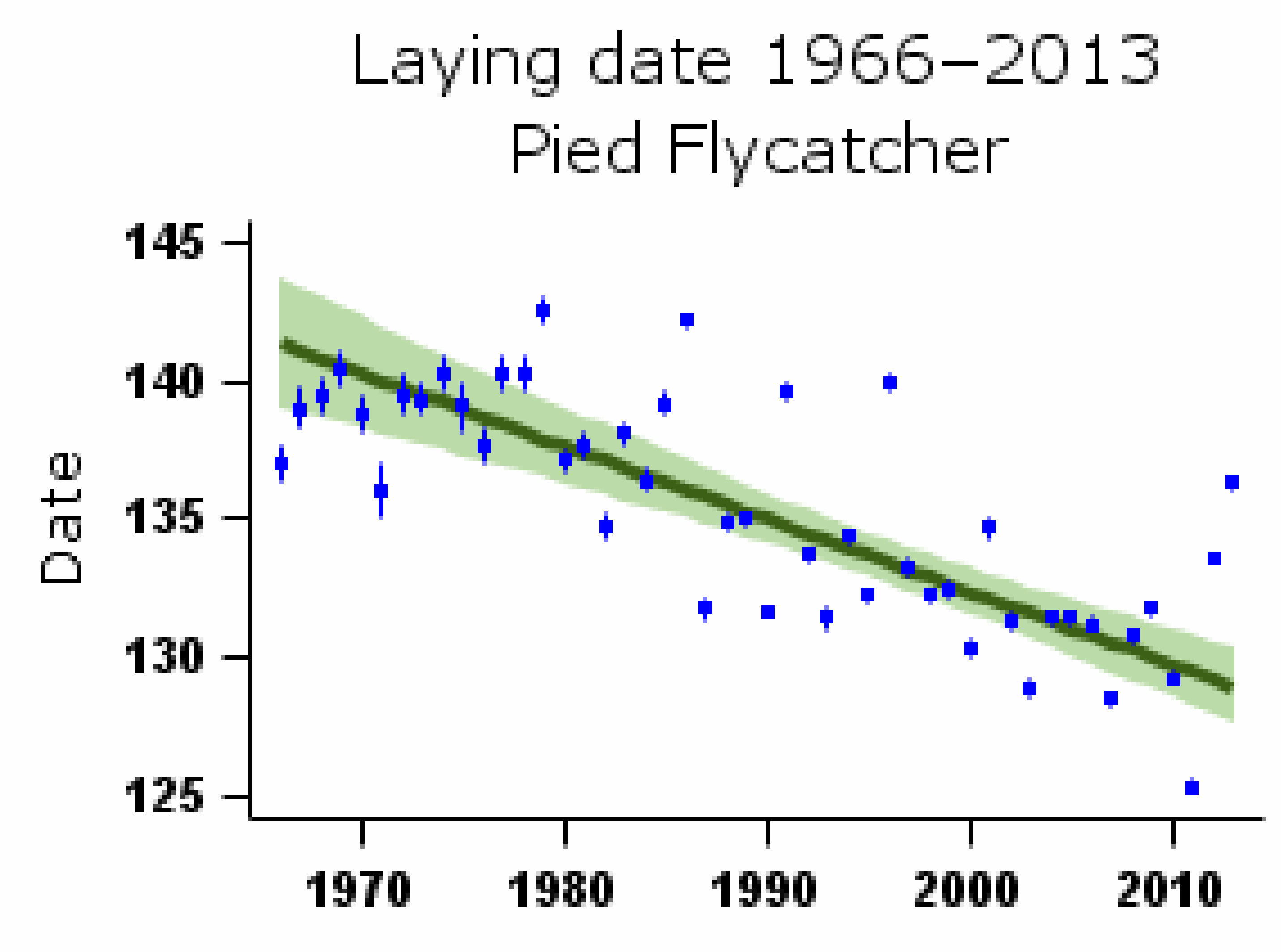


BBS UK graph

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

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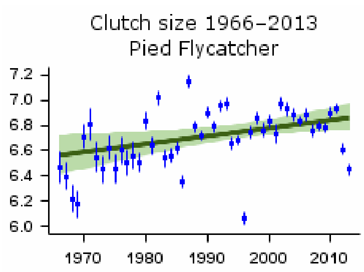
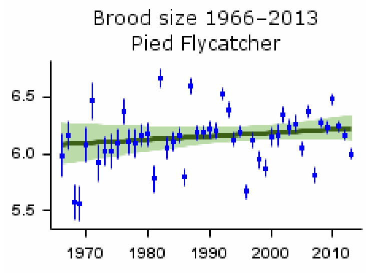
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	362	None					
Clutch size	44	1968-2012	361	Linear increase	6.58 eggs	6.86 eggs	4.3%		
Brood size	44	1968-2012	397	None					
Nest failure rate at egg stage	44	1968-2012	442	Curvilinear	0.57% nests/day	0.26% nests/day	-54.4%		
Nest failure rate at chick stage	44	1968-2012	364	Linear increase	0.37% nests/day	0.69% nests/day	86.5%		
Laying date	44	1968-2012	447	Linear decline	May 21	May 9	-12 days		

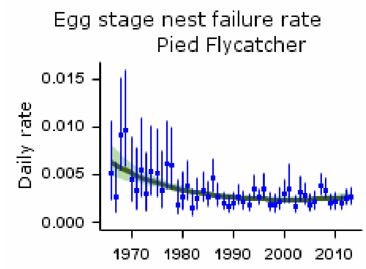
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



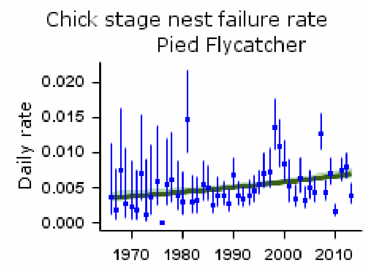
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



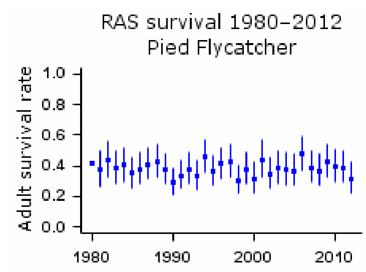
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



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. 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 were related to monthly mean temperatures on 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).

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Redstart

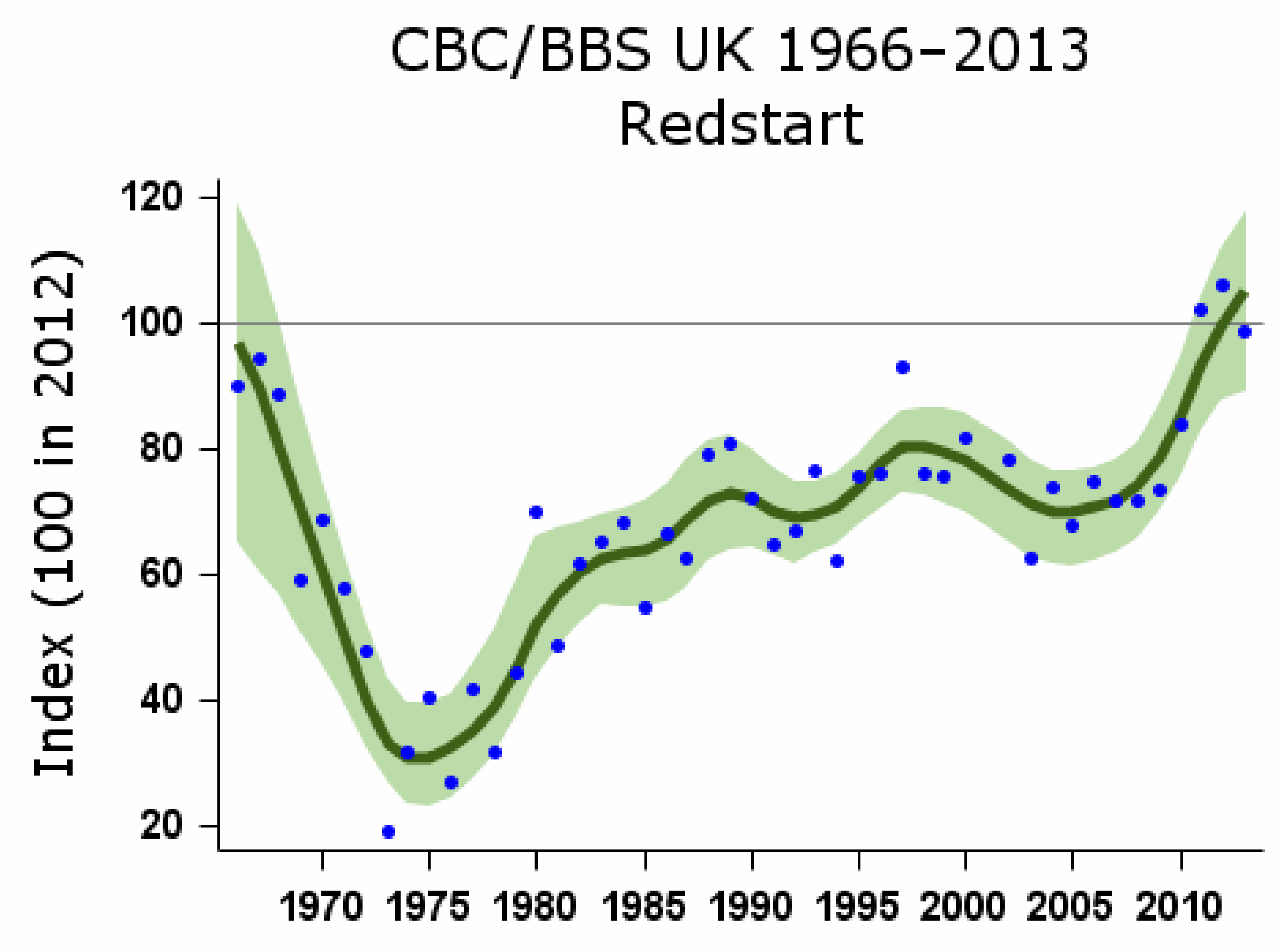
Phoenicurus phoenicurus

Key facts

Conservation listings:	Europe: SPEC category 2 (depleted) (BiE04) UK: amber (European status) (BoCC3)
Long-term trend:	UK, England: fluctuating, with no long-term trend
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

A sharp 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 20% loss of occupied 10-km squares in Britain between 1968-72 and 1988-91 (Gibbons et al. 1993). A recovery in population size began in the mid 1970s and appears to have been sustained subsequently, although with some setbacks. 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). Range, meanwhile, has contracted further, especially in the lowlands (Balmer et al. 2013). There has been widespread moderate increase across Europe since 1980 (PECBMS 2014a).



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

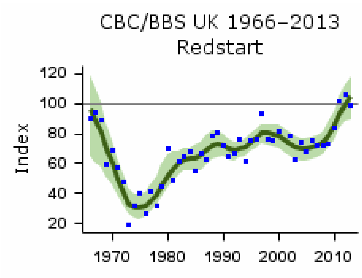
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	45	1967-2012	82	12	-21	86		
	25	1987-2012	130	46	19	78		
	10	2002-2012	179	36	21	56		
	5	2007-2012	207	39	27	60		

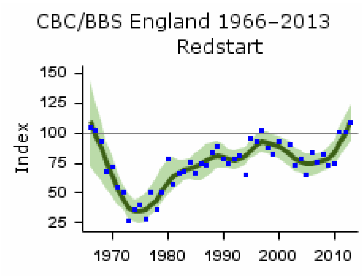
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	45	1967-2012	50	1	-32	70		Small CBC sample
	25	1987-2012	77	30	4	68		
	10	2002-2012	104	21	5	41		
	5	2007-2012	126	32	19	49		
BBS UK	17	1995-2012	165	44	23	62		
	10	2002-2012	179	42	26	59		
	5	2007-2012	207	44	31	65		
BBS England	17	1995-2012	94	20	0	42		
	10	2002-2012	104	22	6	44		
	5	2007-2012	126	32	19	53		
BBS Wales	17	1995-2012	58	46	22	82		
	10	2002-2012	61	49	23	85		
	5	2007-2012	65	48	26	84		

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

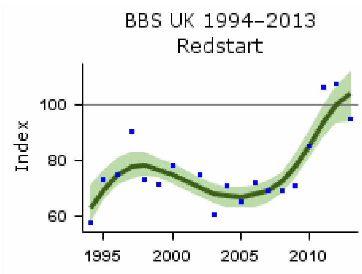
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



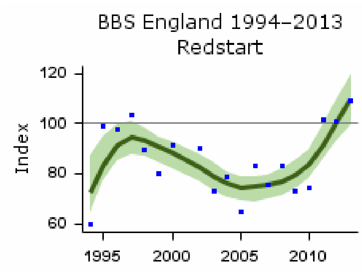
CBC/BBS UK graph



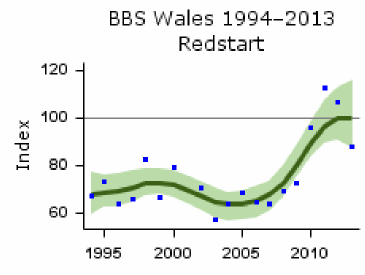
CBC/BBS England graph



BBS UK graph

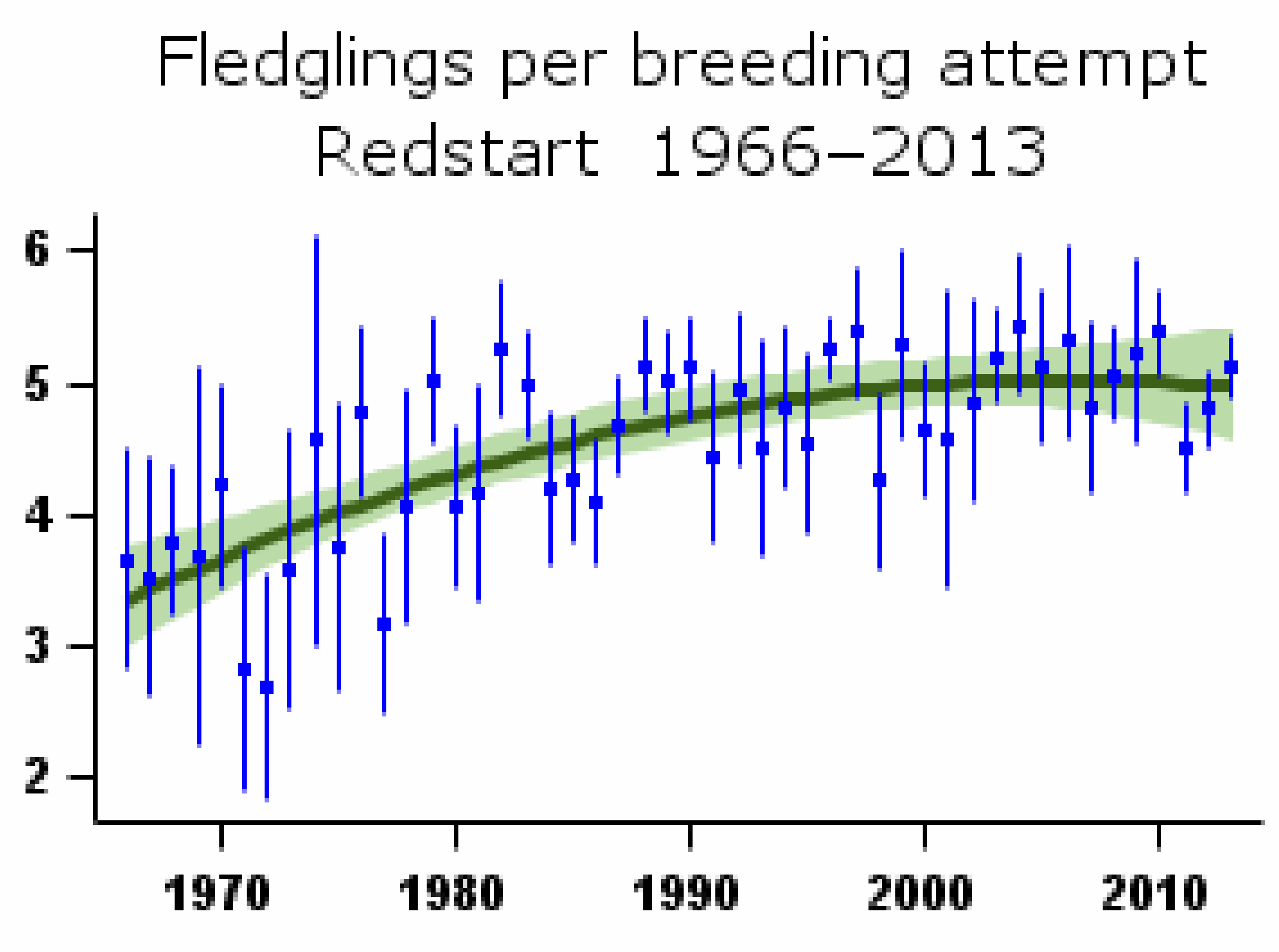


BBS England graph

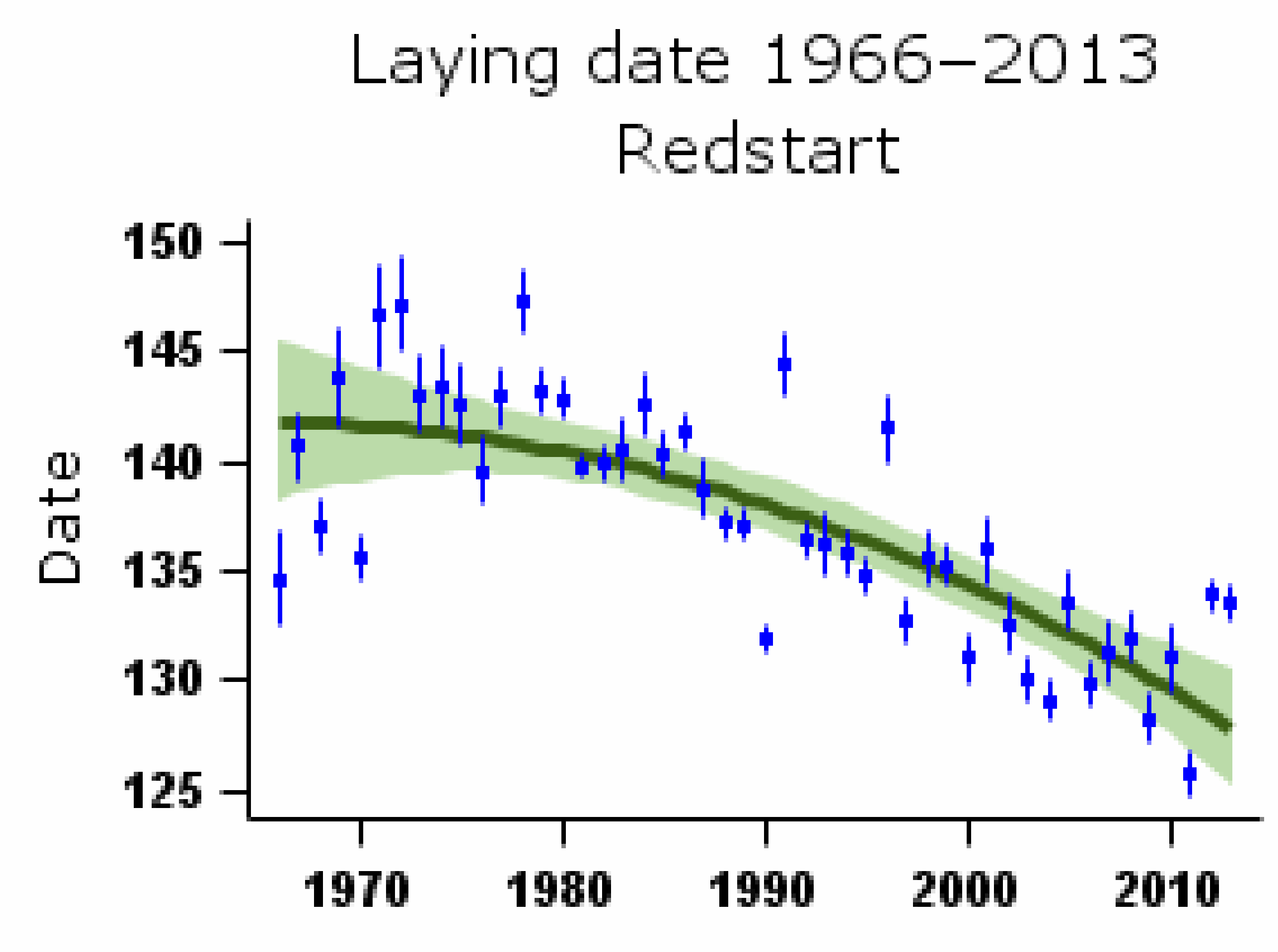


BBS Wales graph

Demographic trends



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

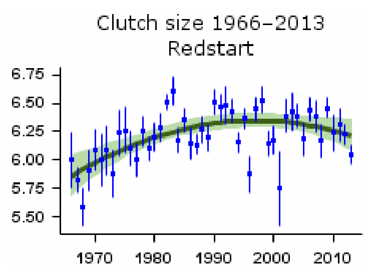


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

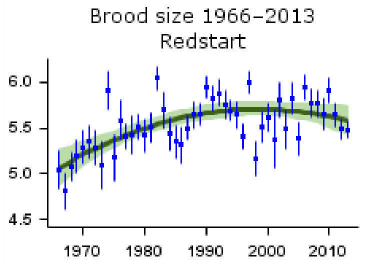
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	56	Curvilinear	3.51 fledglings	4.99 fledglings	42.0%		
Clutch size	44	1968-2012	52	Curvilinear	5.92 eggs	6.23 eggs	5.3%		
Brood size	44	1968-2012	92	Curvilinear	5.14 chicks	5.60 chicks	8.9%		
Nest failure rate at egg stage	44	1968-2012	78	Curvilinear	1.36% nests/day	0.58% nests/day	-57.4%		
Nest failure rate at chick stage	44	1968-2012	56	Linear decline	1.21% nests/day	0.33% nests/day	-72.7%		
Laying date	44	1968-2012	66	Curvilinear	May 22	May 8	-14 days		

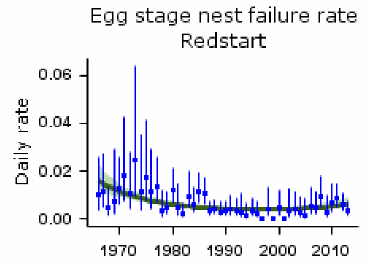
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



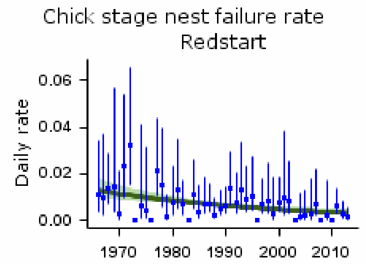
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



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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Whinchat

Saxicola rubetra

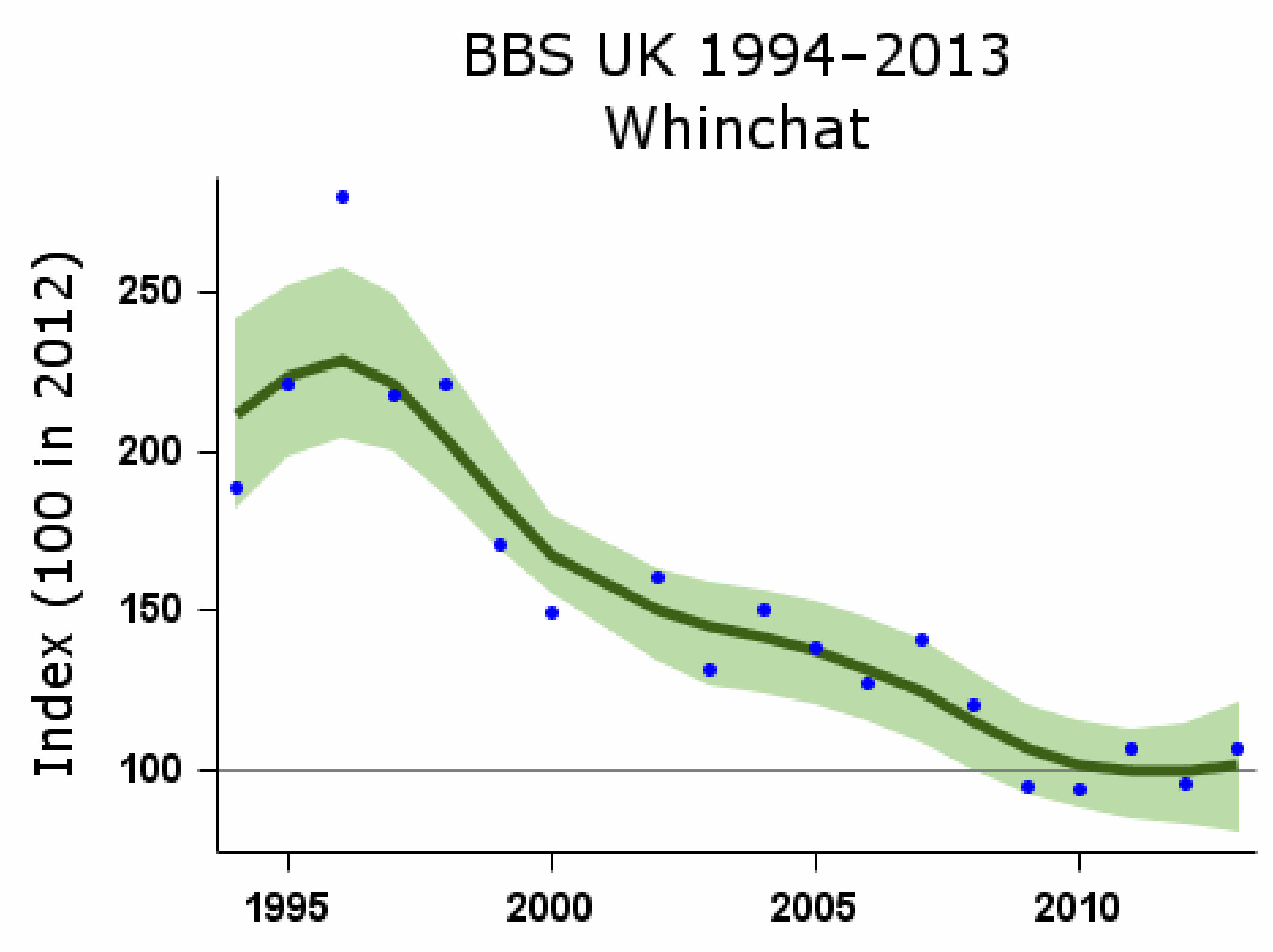
Key facts

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 by census surveys 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 more intensive management of farmland (Marchant et al. 1990). Further extinctions have occurred since then among the remaining pockets of lowland breeders (Balmer et al. 2013). In the uplands, Whinchat habitat is now somewhat restricted, being sandwiched between intensive agriculture at lower levels and higher land unsuitable for breeding, and limited also by aspect (Calladine & Bray 2012). In a study focused on upland grasslands, a 95% decline was noted between 1968-80 and 1999-2000 (Henderson et al. 2004). BBS data indicate that strong population decline has taken place since 1994, raising BTO alerts for the UK as a whole as well as for England. Nest-record samples are small, but indicate a substantial recent rise in nest losses at the egg stage, which is of NRS concern (Leech & Barimore 2008). Whinchats have shown a widespread moderate decline across Europe since 1980 (PECBMS 2014a). On the strength of its UK decline, Whinchat was moved from the green to the amber list of conservation concern in 2009 (Eaton et al. 2009). It is among a suite of species that winter in the humid zone of West Africa and correspondingly are showing the strongest population declines among our migrant species (Ockendon et al. 2012, 2014).

In 2012, BTO conducted a Wales Chat Survey for Whinchats, Stonechats and Wheatears on over 300 sample Welsh 1-km squares. The survey was designed to 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

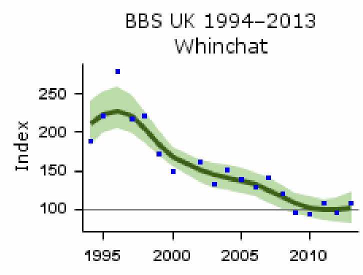
Population changes in detail

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

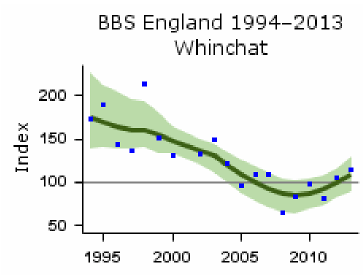
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	17	1995-2012	76	-55	-67	-43	>50	
	10	2002-2012	71	-33	-46	-16	>25	
	5	2007-2012	78	-20	-35	-4		
BBS England	17	1995-2012	33	-41	-63	-19	>25	
	10	2002-2012	34	-27	-45	-11	>25	
	5	2007-2012	40	8	-11	37		

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

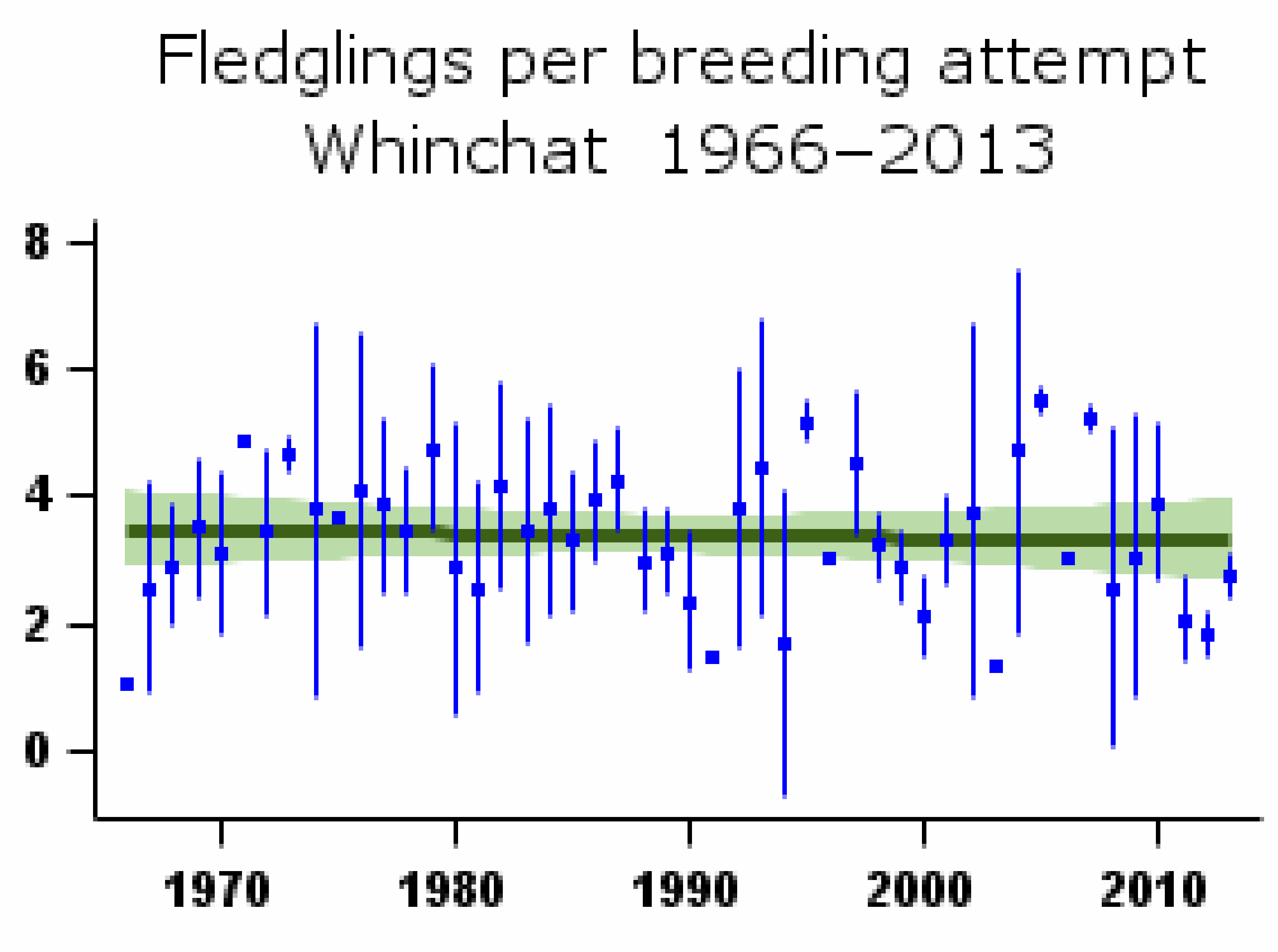


BBS UK graph

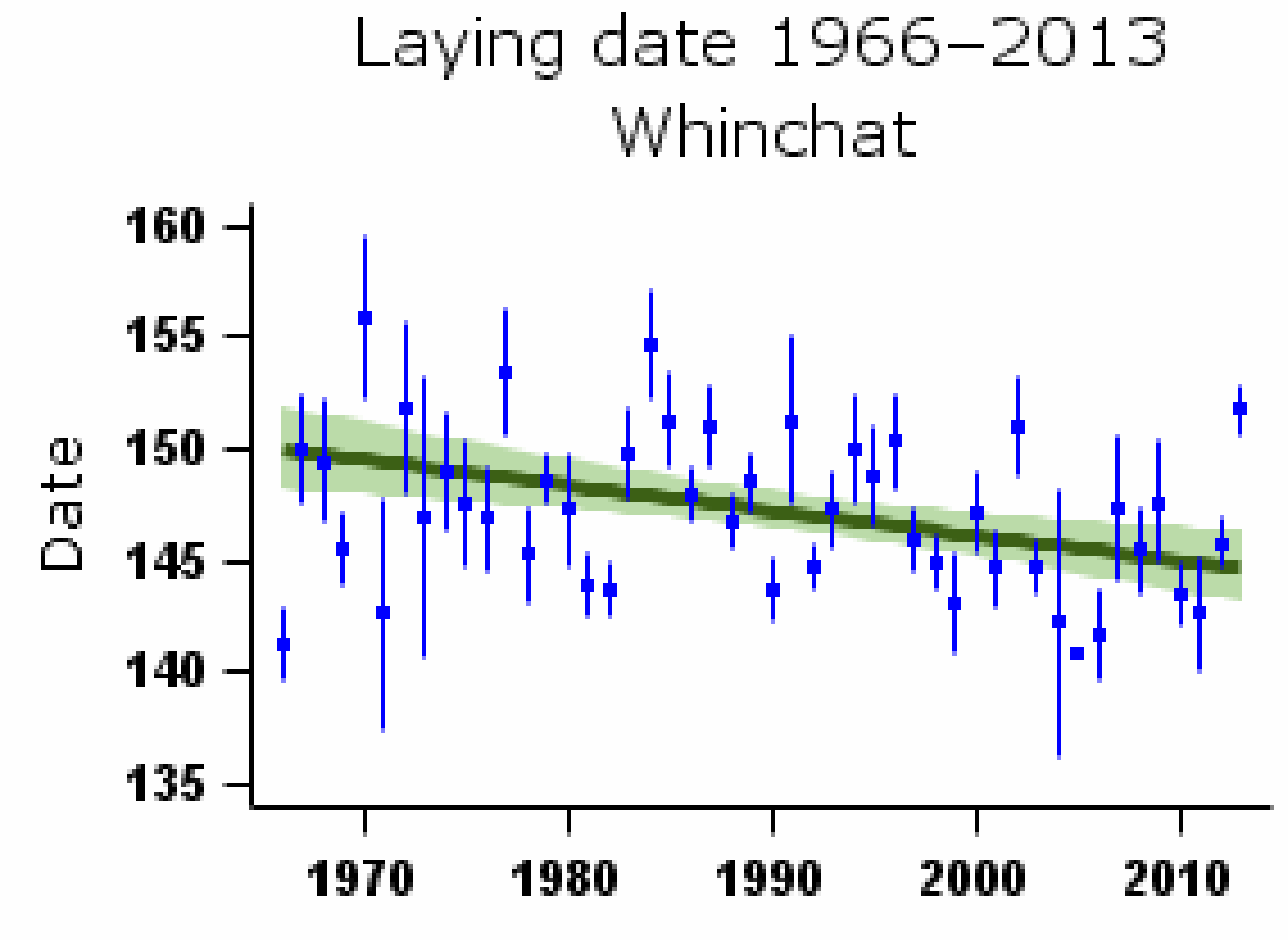


BBS England graph

Demographic trends



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

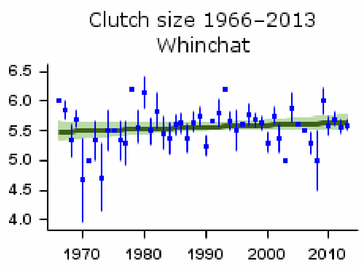


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

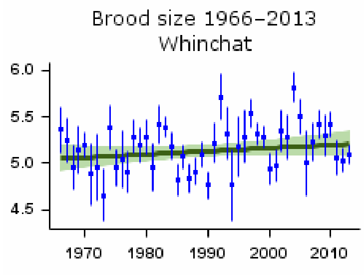
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	17	None					
Clutch size	44	1968-2012	14	None					Small sample
Brood size	44	1968-2012	41	None					
Nest failure rate at egg stage	44	1968-2012	18	Linear increase	0.52% nests/day	3.25% nests/day	525.0%		Small sample
Nest failure rate at chick stage	44	1968-2012	29	Curvilinear	2.44% nests/day	2.61% nests/day	7.0%		Small sample
Laying date	44	1968-2012	31	Linear decline	May 30	May 25	-5 days		

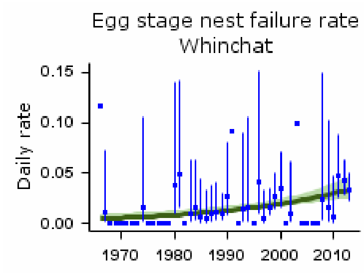
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



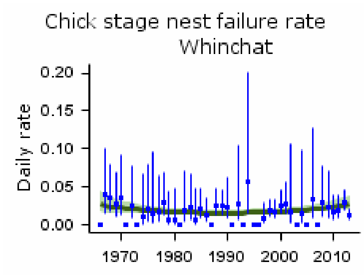
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



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 the decline of the Whinchat may be due to changes in management of cultivated grassland and semi-managed meadows, with reduction of invertebrates and loss of nests. However, more nest record data would be necessary to establish the impact of nest loss on overall productivity.

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

Further information on causes of change

Whinchat is a species historically associated with lowland cultivated grassland and semi-natural meadows (Muller et al. 2005, Britschgi et al. 2006, Broyer 2009). Its decline has been linked to changes in management of cultivated grassland. Early mowing of grassland habitats causes direct losses of nests and even mortality of incubating females and, indirectly, makes the birds more conspicuous to predators (Gruebler et al. 2008). Grassland intensification reduces invertebrate availability, through direct removal with cut grass, and by reducing vegetation diversity due to the application of fertilisers (Britschgi et al. 2006).

An increasing proportion of the population in Europe is now found in the uplands, where agricultural intensification has been less marked (Muller et al. 2005, Archaux 2007, Broyer 2009). Upland margins have become refuges for species that have declined in farmland (Fuller et al. 2006), with grassland, moorland, bracken, scrub and scattered trees now supporting breeding population of Whinchats (Stillman & Brown 1994, Gillings et al. 2000). On British moorland, Whinchats are associated with dense vegetation, in particular bracken (Allen 1995) and scrub with mainly grassy ground cover (Pearce-Higgins & Grant 2006). Vegetation that does not allow access to ground invertebrates is too dense to suit this species (Thompson et al. 1995). Calladine & Bray (2012) point out that Whinchat habitat in the uplands is more limited than may at first appear.

These upland margins are also vulnerable to long-term changes, such as afforestation or abandonment of agriculture, as well as grazing pressure, which has been increasing since the mid 1970s (Fuller & Gough 1999, Fuller et al. 2006). Afforestation may not be detrimental in its early successional stages, however (Gillings et al. 2000).

Demographic data are insufficient to investigate whether trends in breeding productivity or survival have influenced population size. Whinchats have decreased on a very broad scale across Britain and Europe, however, and more research is needed on connectivity between breeding and wintering areas to help pinpoint the causes of decline (Henderson et al. 2014).

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Stonechat

Saxicola rubicola

Key facts

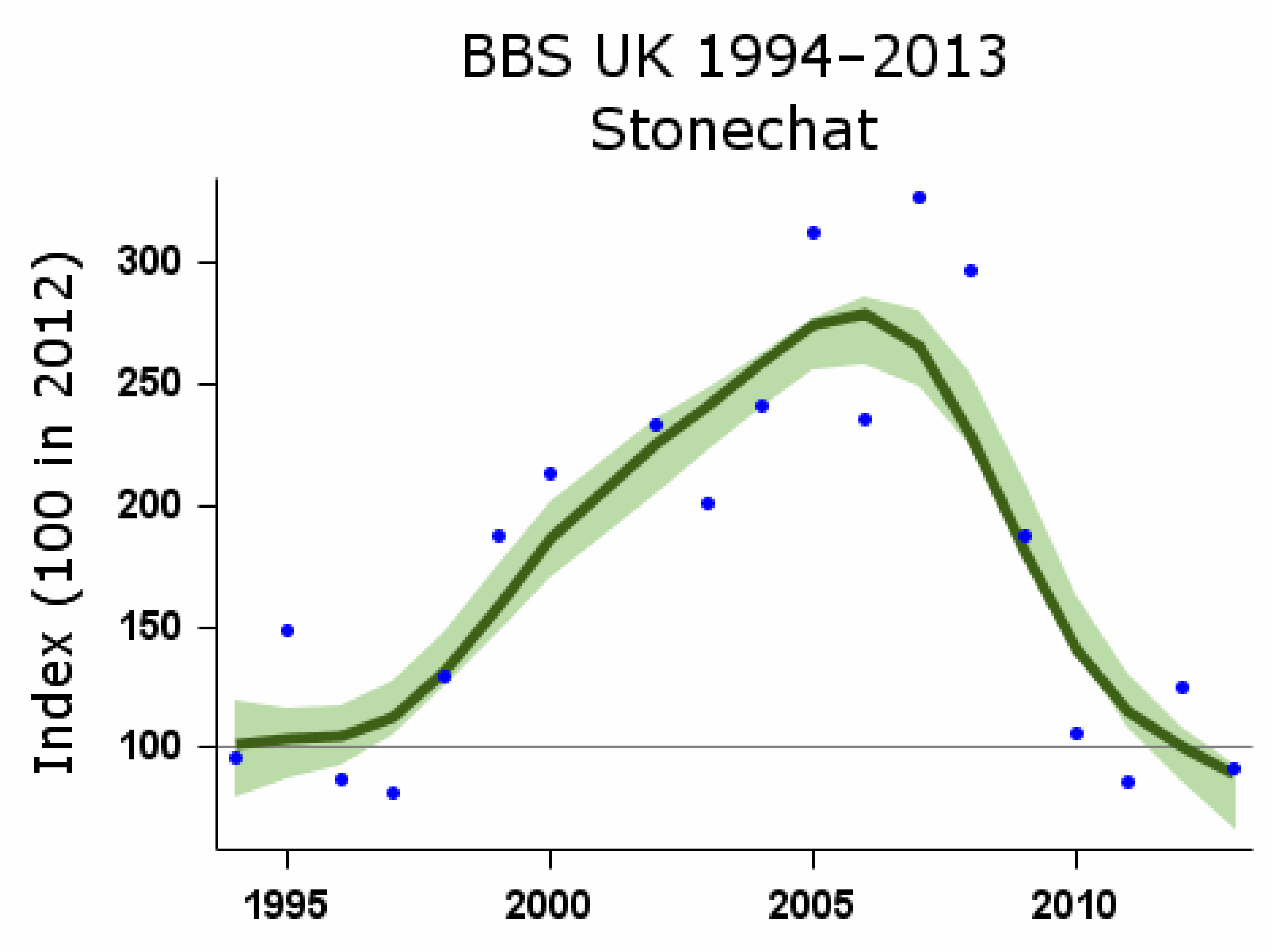
Conservation listings:	Europe: no SPEC category (favourable conservation status in Europe, not concentrated in Europe) (BiE04) UK: green (BoCC3)
Long-term trend:	UK: probably fluctuating, with no long-term trend
Population size:	59,000 (39,000-79,000) pairs in 2009 (APEP13: distance-sampling estimate 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 in the preceding decades: 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 1968-72 and 1988-91 (Gibbons et al. 1993). Against this background, the strongly increasing BBS trend to 2006 represents substantial and possibly even complete recovery. By 2008-11, the earlier range losses had been almost entirely reversed (Balmer et al. 2013). Atlas and BBS data reveal complex shifts recently in the Stonechat's range, involving expansion northward and on the west coast and a detectable increase in altitude (Henderson et al. 2014).

Nest failure rates have fallen markedly over the long term. Following increases widely across Europe, the species is now provisionally categorised as 'secure' (BirdLife International 2004) and consequently has recently been moved from the amber to the green list in the UK (Eaton et al. 2009). UK data since about 2008 indicate a sharp decrease, however, partly in response to recent snowy winters, and an accompanying decrease in nest productivity. The European trend has been stable since 1989 (PECBMS 2014a).

In 2012, BTO conducted a Wales Chat Survey for Whinchats, Stonechats and Wheatears on over 300 sample Welsh 1-km squares. The survey was designed to estimate breeding numbers and distribution and record habitat choice by territorial males.



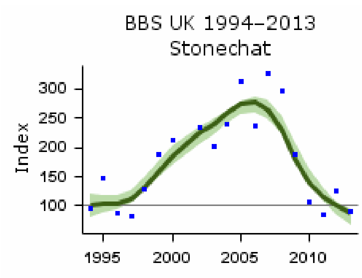
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

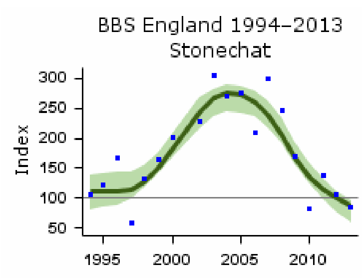
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	17	1995-2012	157	-3	-24	23		
	10	2002-2012	199	-56	-63	-47	>50	
	5	2007-2012	219	-62	-70	-57	>50	
BBS England	17	1995-2012	72	-11	-42	33		
	10	2002-2012	95	-59	-70	-47	>50	
	5	2007-2012	114	-58	-69	-51	>50	
BBS Scotland	17	1995-2012	37	-21	-51	19		
	10	2002-2012	45	-59	-71	-41	>50	
	5	2007-2012	51	-71	-80	-62	>50	
BBS Wales	17	1995-2012	36	59	6	161		
	10	2002-2012	45	-37	-50	-11	>25	
	5	2007-2012	42	-45	-53	-28	>25	

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

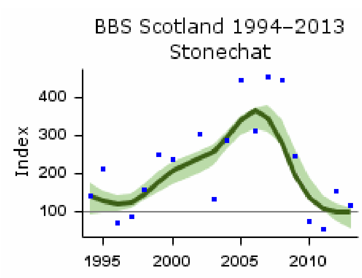
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



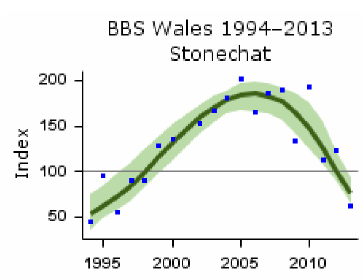
BBS UK graph



BBS England graph

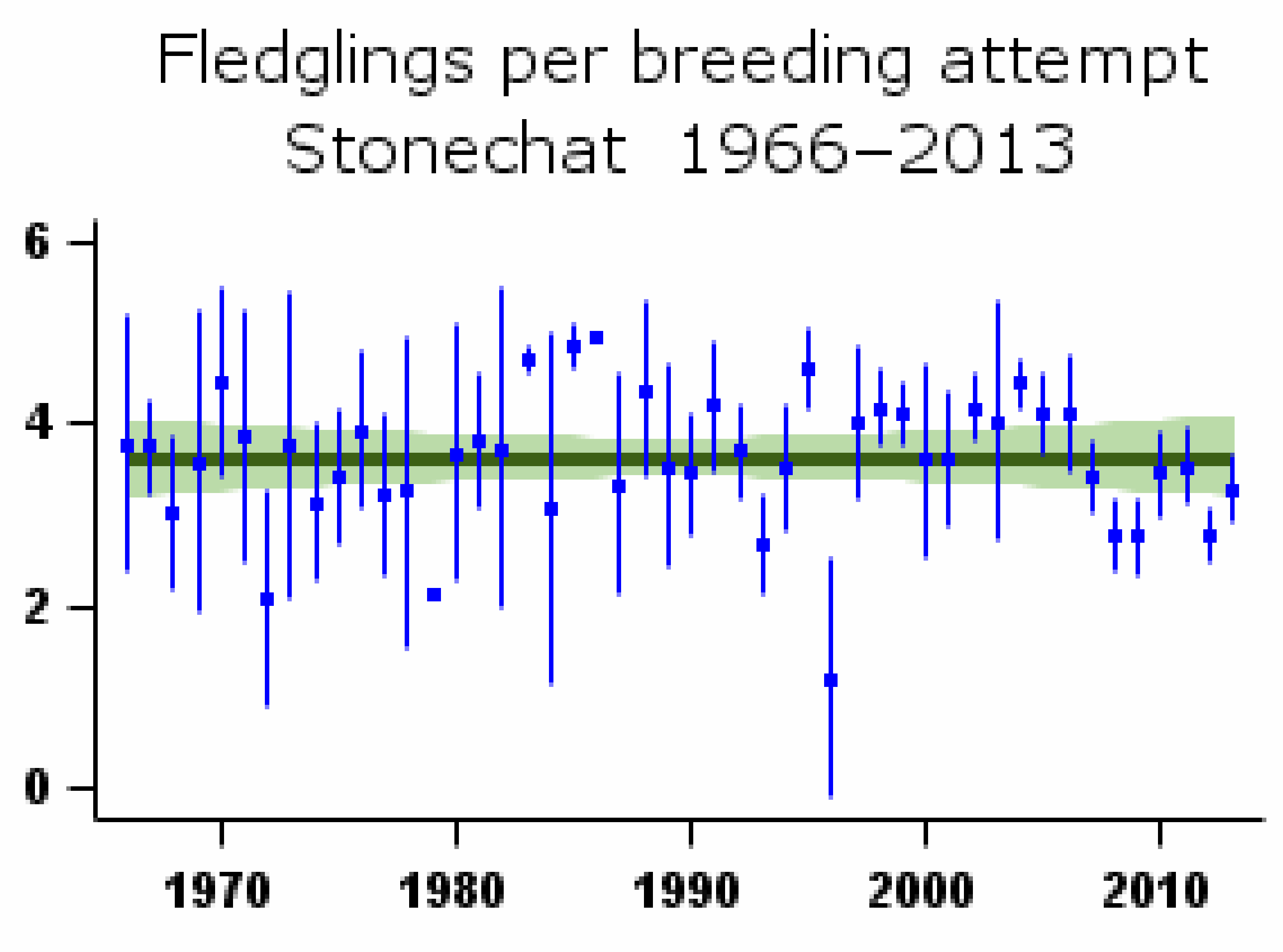


BBS Scotland graph

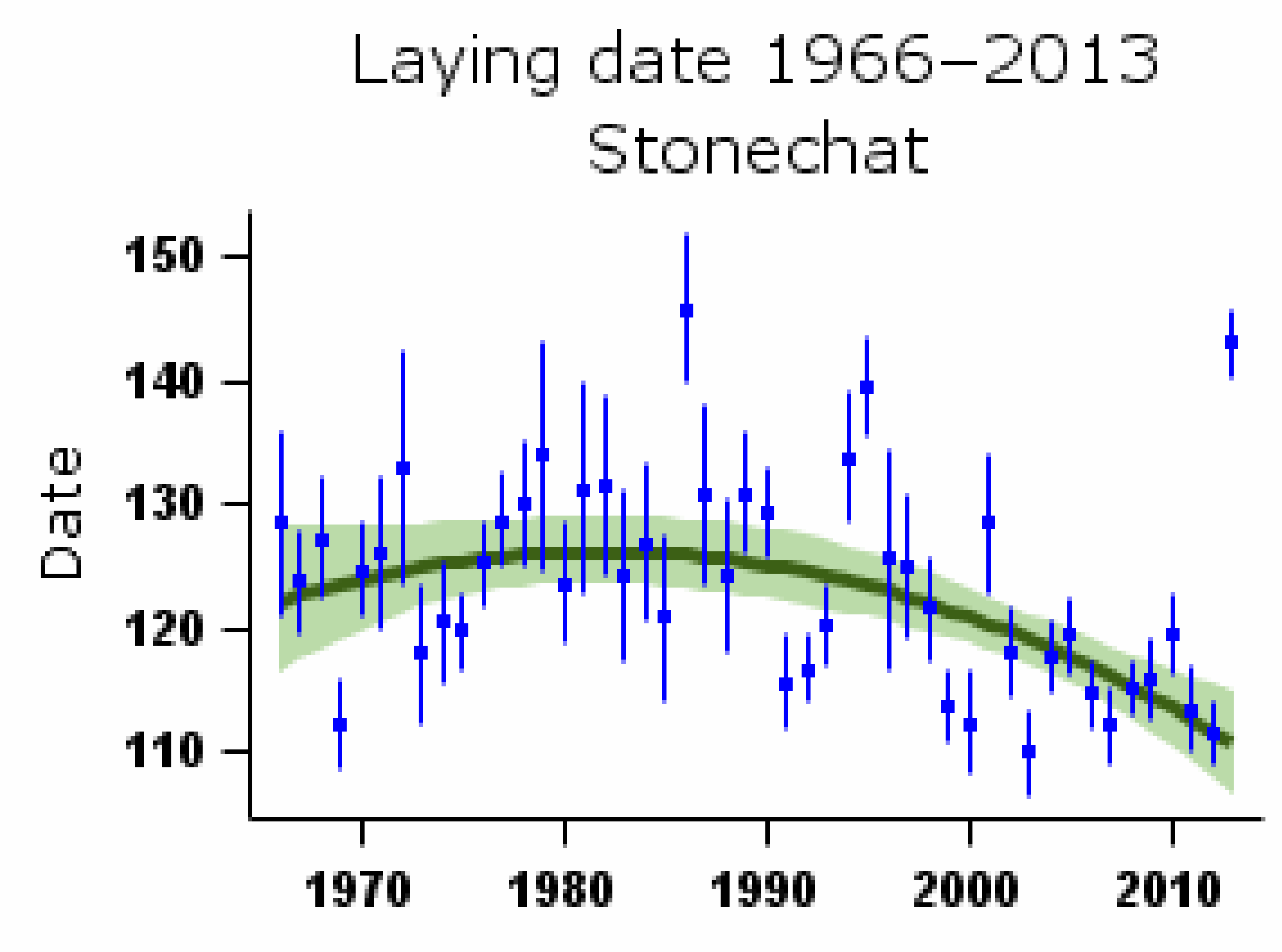


BBS Wales graph

Demographic trends



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

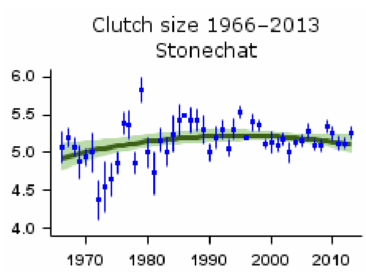


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

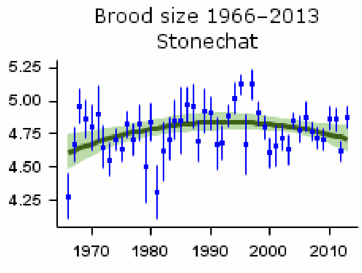
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	39	None					
Clutch size	44	1968-2012	35	Curvilinear	4.98 eggs	5.12 eggs	2.9%		
Brood size	44	1968-2012	69	Curvilinear	4.64 chicks	4.72 chicks	1.7%		
Nest failure rate at egg stage	44	1968-2012	40	None					
Nest failure rate at chick stage	44	1968-2012	63	Curvilinear	1.67% nests/day	1.59% nests/day	-4.8%		
Laying date	44	1968-2012	44	Curvilinear	May 3	Apr 22	-11 days		

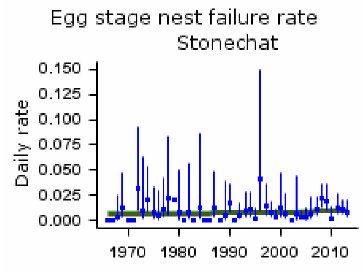
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



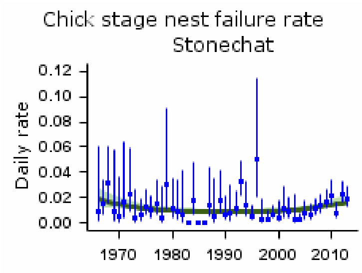
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



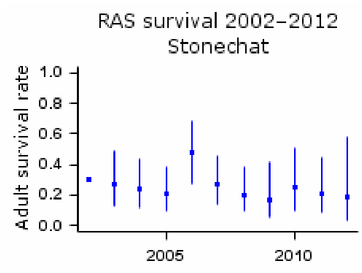
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Wheatear

Oenanthe oenanthe

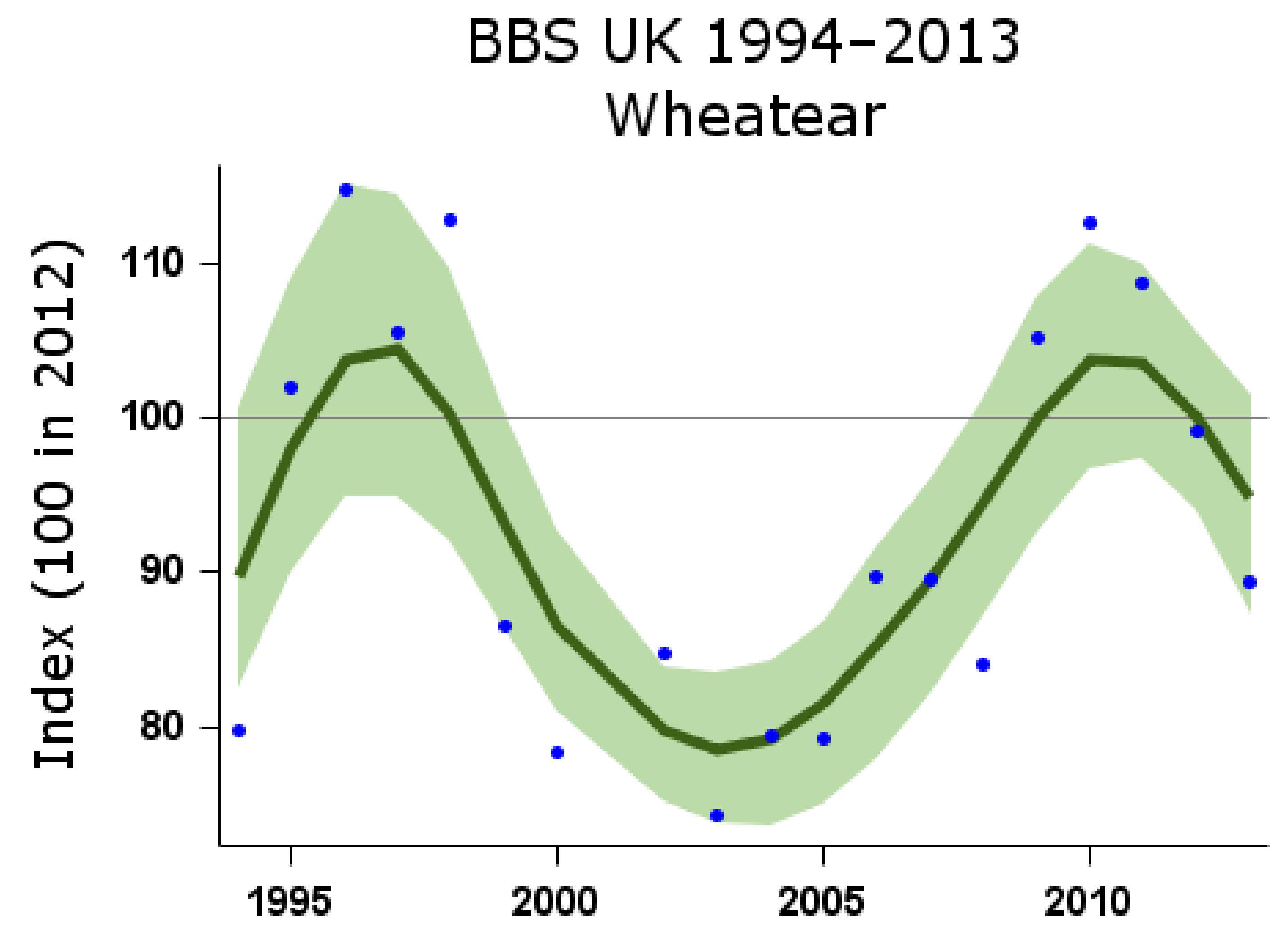
Key facts

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. Further loss of range, especially in lowland England, had been recorded by 2008-11 (Balmer et al. 2013). BBS trends show wide fluctuations, with little indication of directional change. Previous estimates of UK population have been revised strongly upward, based on BBS distance-sampling data (Gillings et al. 2007). Nest failure rates at the egg stage have fallen substantially and nest productivity has risen. Wheatear has shown moderate decline across Europe since 1980 (PECBMS 2013a). Following widespread declines during the 1990s, the European status of this species is no longer considered 'secure' (BirdLife International 2004). Accordingly, the species was moved from the green to the amber list in the UK in 2009 (Eaton et al. 2009). Studies of remnant populations in the Netherlands indicate that conservation action may need to be site specific (van Oosten et al. 2015).

In 2012, BTO conducted a Wales Chat Survey for Whinchats, Stonechats and Wheatears on over 300 sample Welsh 1-km squares. 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

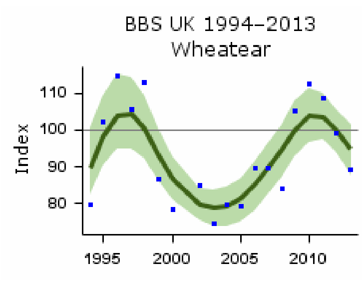
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	17	1995-2012	341	2	-16	18		

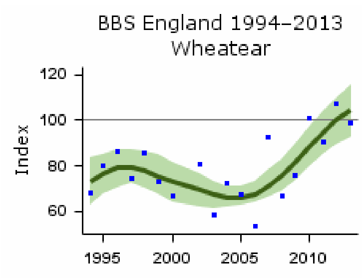
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	10	2002-2012	391	25	13	41		
	5	2007-2012	466	12	2	22		
BBS England	17	1995-2012	196	30	4	65		
	10	2002-2012	237	44	17	82		
	5	2007-2012	305	40	24	53		
BBS Scotland	17	1995-2012	81	-16	-34	11		
	10	2002-2012	82	8	-8	30		
	5	2007-2012	91	-9	-21	8		
BBS Wales	17	1995-2012	52	-9	-28	7		
	10	2002-2012	58	18	-8	47		
	5	2007-2012	56	12	-11	35		

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

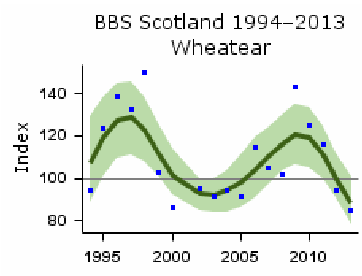
BTO JNCC rspb The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



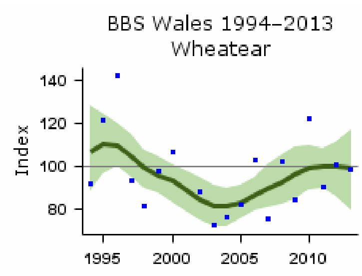
BBS UK graph



BBS England graph

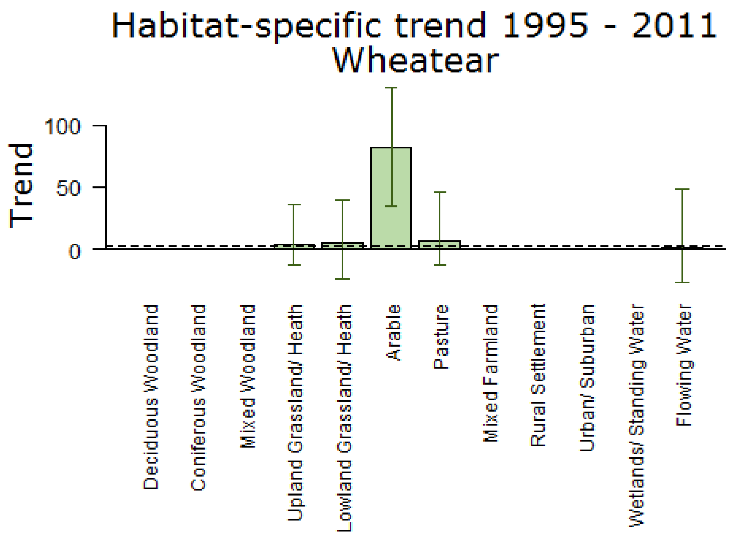


BBS Scotland graph



BBS Wales graph

Population trends by habitat



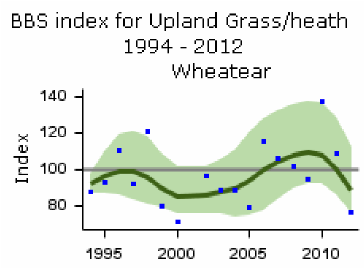
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

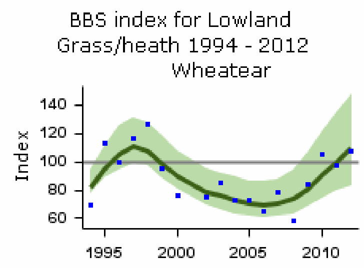
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Upland Grassland/ Heath	16	1995-2011	63	4	-12	35
Lowland Grassland/ Heath	16	1995-2011	49	5	-24	40
Arable	16	1995-2011	30	82	34	130
Pasture	16	1995-2011	114	6	-13	46
Flowing Water	16	1995-2011	40	1	-26	48

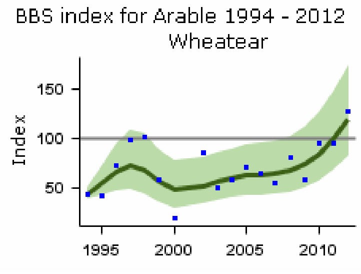
Further information on habitat-specific trends, please follow link here.



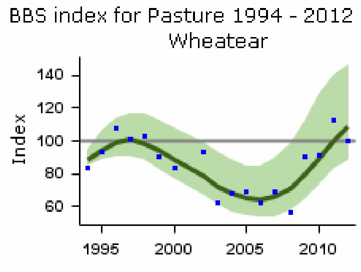
Habitat graph



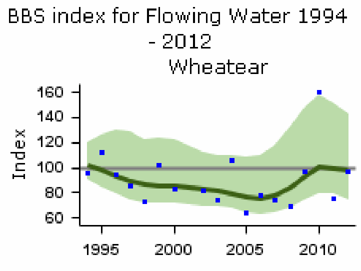
Habitat graph



Habitat graph

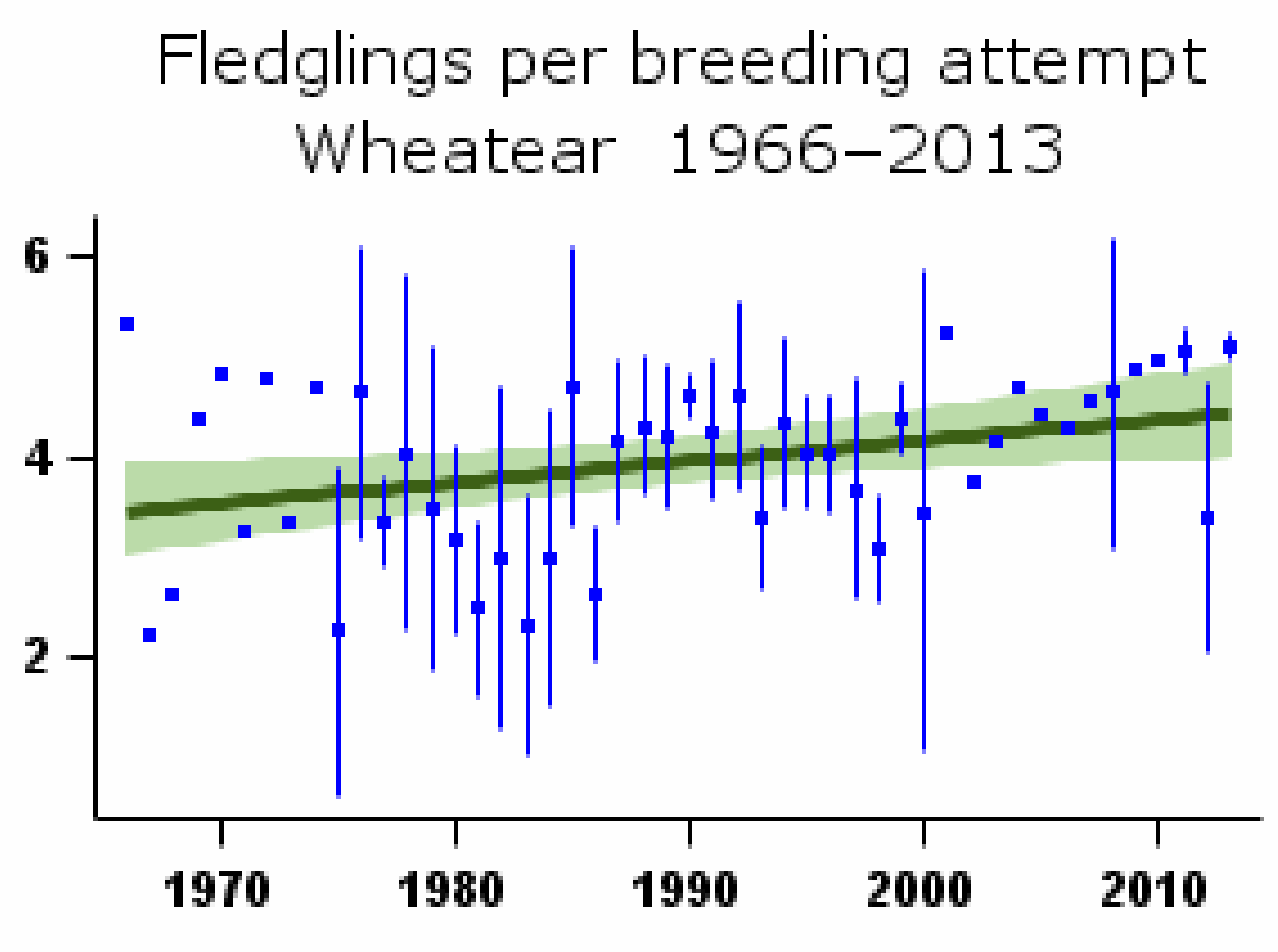


Habitat graph

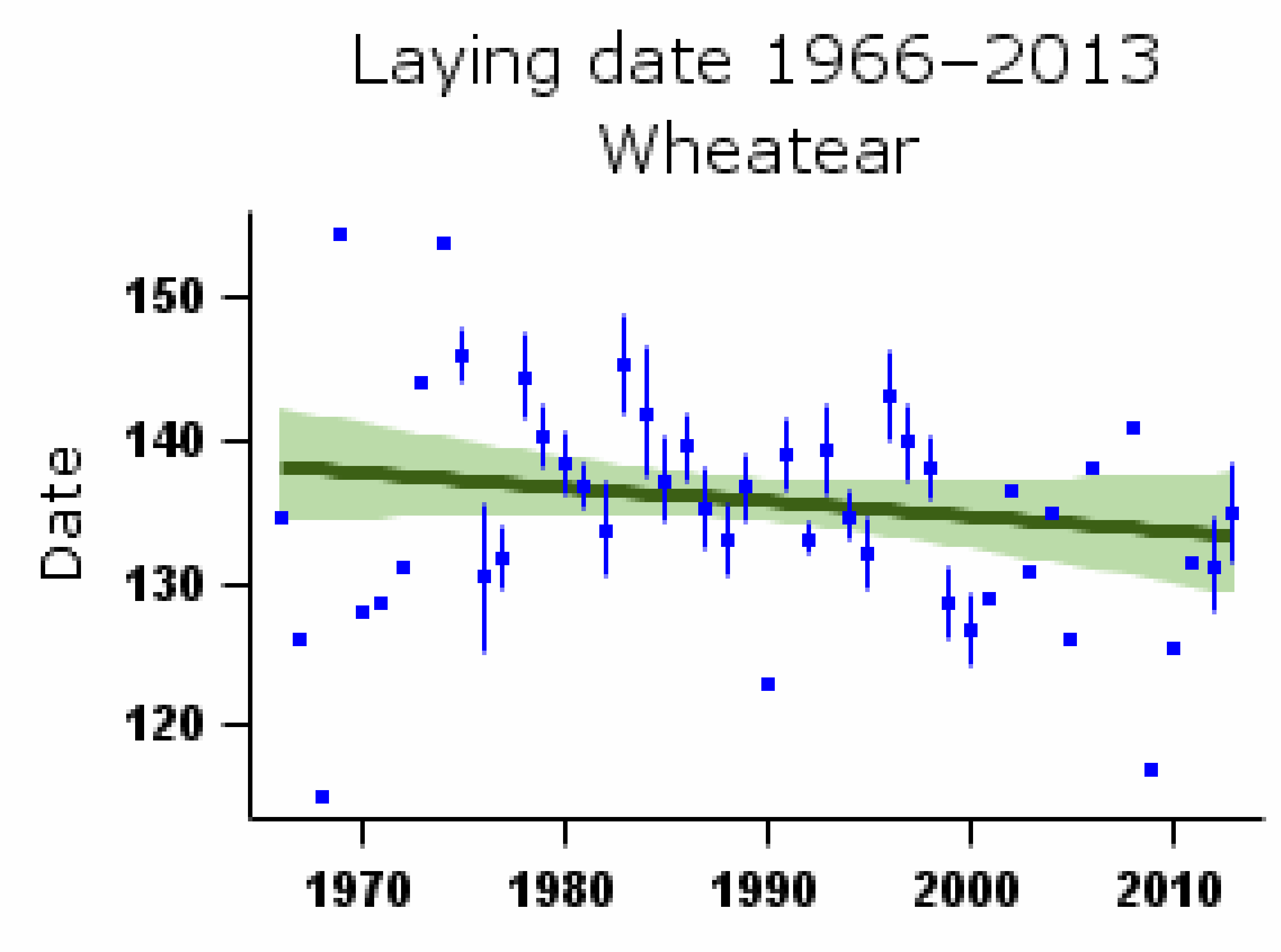


Habitat graph

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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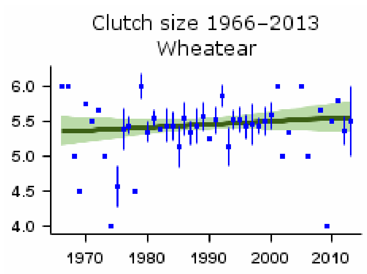
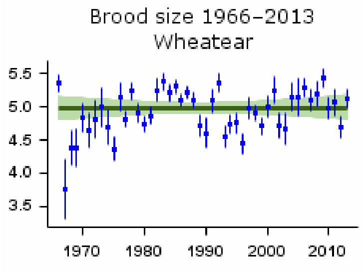
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	16	Linear increase	3.51 fledglings	4.43 fledglings	26.2%		
Clutch size	44	1968-2012	11	None					Small sample
Brood size	44	1968-2012	56	None					
Nest failure rate at egg stage	44	1968-2012	16	Linear decline	2.41% nests/day	0.36% nests/day	-85.1%		Small sample
Nest failure rate at chick stage	44	1968-2012	38	None					
Laying date	44	1968-2012	12	None			0 days		Small sample

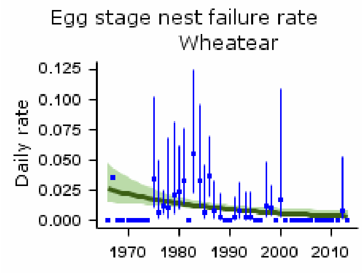
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



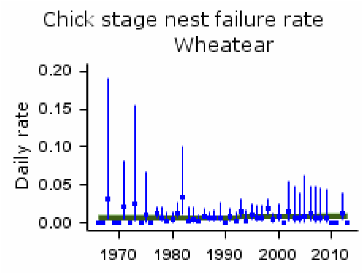
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



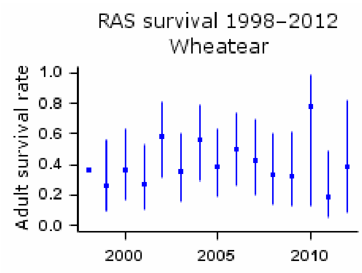
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Dunnock

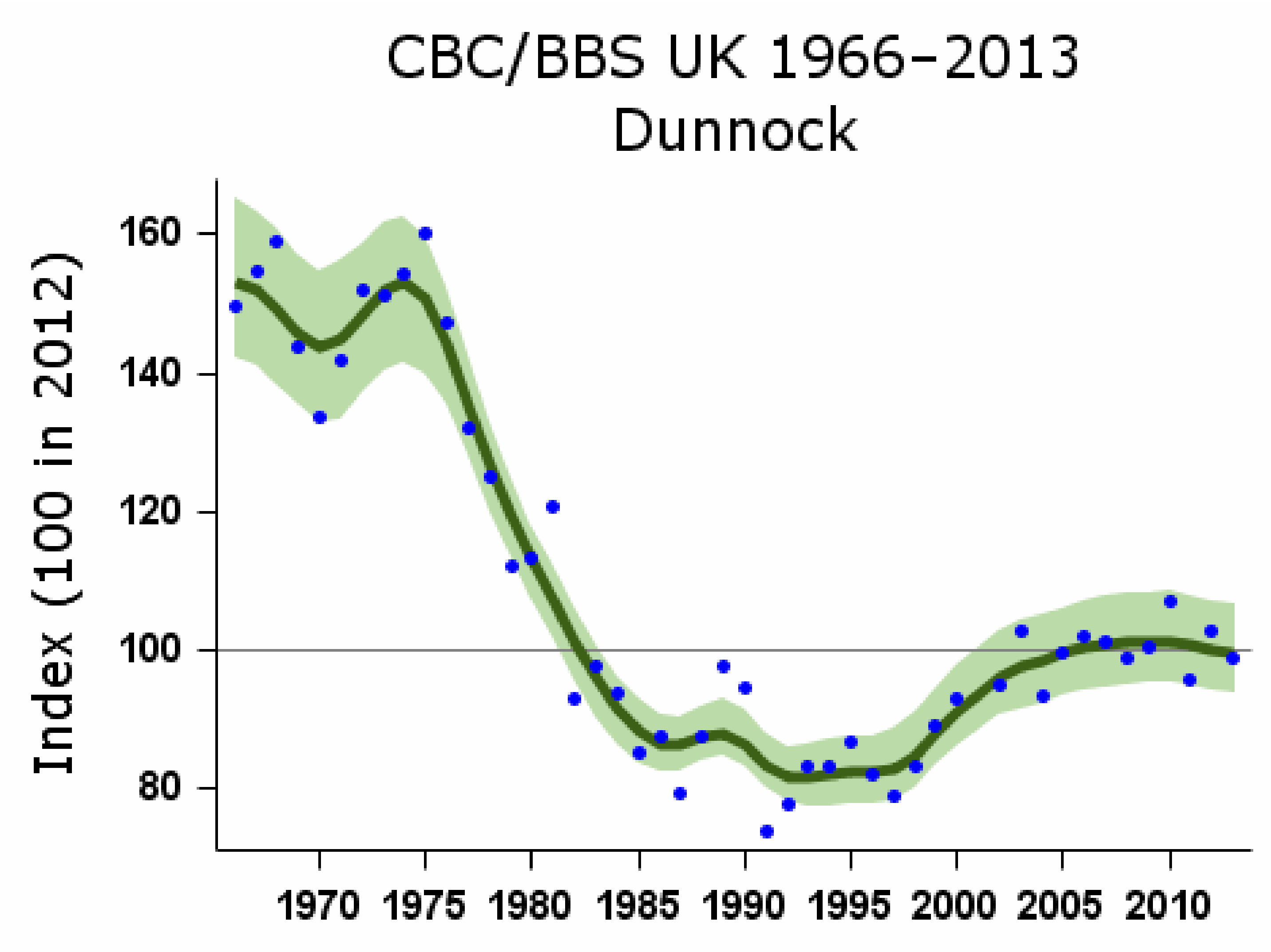
Prunella modularis

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 still meets amber-list criteria. The BBS PECBMS 2014a).



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

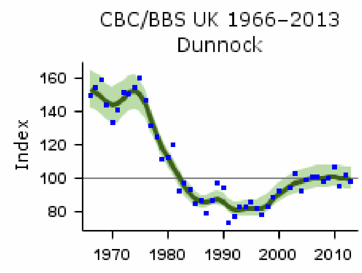
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	45	1967-2012	963	-34	-43	-22	>25	
	25	1987-2012	1561	16	6	28		
	10	2002-2012	2365	4	1	8		
	5	2007-2012	2632	-1	-2	2		
CBC/BBS England	45	1967-2012	795	-38	-46	-28	>25	
	25	1987-2012	1282	10	-2	22		

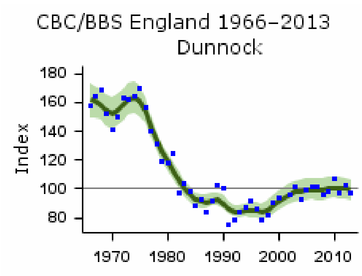
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	5	2007-2012	2162	0	-2	3		
CES adults	28	1984-2012	98	-22	-33	-11		
	25	1987-2012	104	-14	-23	-3		
	10	2002-2012	104	-19	-26	-11		
	5	2007-2012	101	-17	-22	-12		
CES juveniles	28	1984-2012	95	-28	-48	1		
	25	1987-2012	101	-15	-34	12		
	10	2002-2012	102	-19	-30	-7		
	5	2007-2012	99	-12	-23	1		
BBS UK	17	1995-2012	2080	21	16	27		
	10	2002-2012	2365	5	2	8		
	5	2007-2012	2632	0	-2	2		
BBS England	17	1995-2012	1700	15	10	21		
	10	2002-2012	1928	4	1	7		
	5	2007-2012	2162	0	-2	2		
BBS Scotland	17	1995-2012	143	61	35	90		
	10	2002-2012	164	22	7	40		
	5	2007-2012	192	5	-4	15		
BBS Wales	17	1995-2012	154	35	15	54		
	10	2002-2012	175	7	-5	17		
	5	2007-2012	177	-1	-8	7		
BBS N.Ireland	17	1995-2012	70	63	11	102		
	10	2002-2012	84	-20	-29	-8		
	5	2007-2012	85	-15	-22	-7		

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

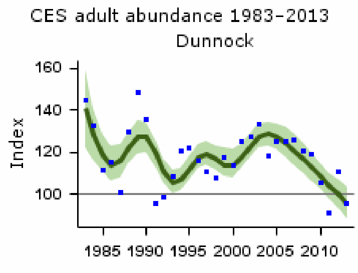
BTO JNCC rspb The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



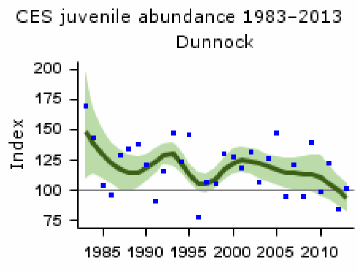
CBC/BBS UK graph



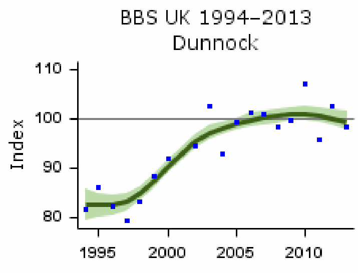
CBC/BBS England graph



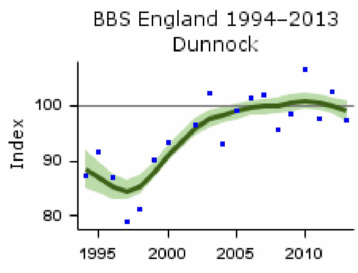
CES adults graph



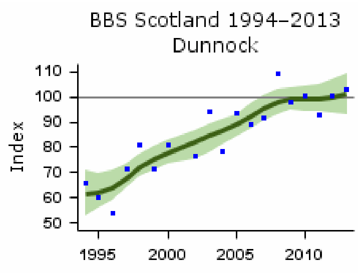
CES juveniles graph



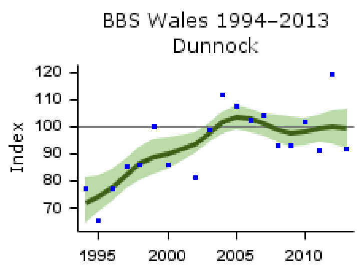
BBS UK graph



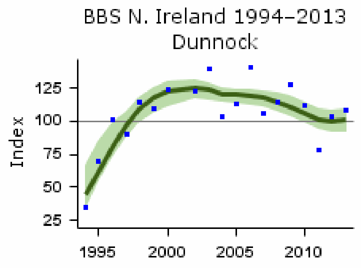
BBS England graph



BBS Scotland graph

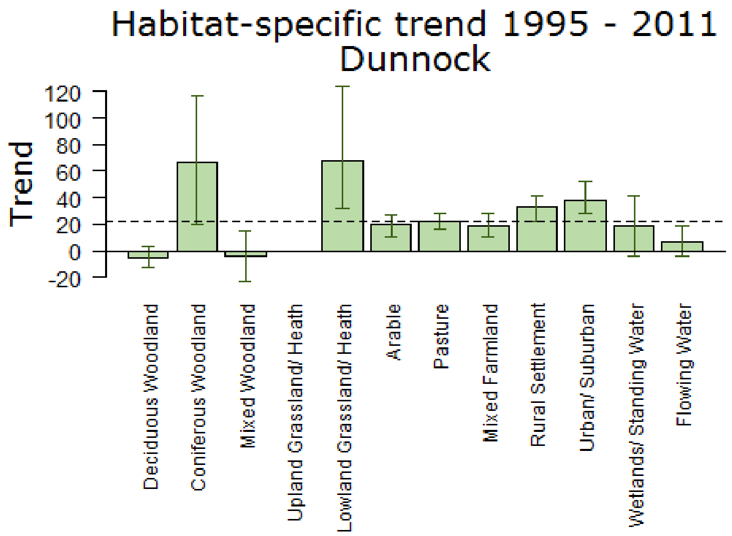


BBS Wales graph



BBS N.Ireland graph

Population trends by habitat



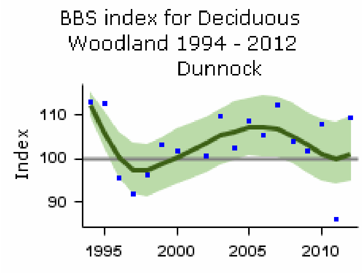
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

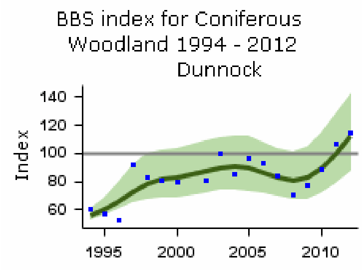
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	528	-6	-12	3
Coniferous Woodland	16	1995-2011	102	66	20	117
Mixed Woodland	16	1995-2011	240	-4	-23	15
Lowland Grassland/ Heath	16	1995-2011	100	68	32	124
Arable	16	1995-2011	605	20	10	27
Pasture	16	1995-2011	1033	22	16	29
Mixed Farmland	16	1995-2011	561	18	10	28
Rural Settlement	16	1995-2011	693	33	22	42
Urban/ Suburban	16	1995-2011	366	38	28	52
Wetlands/ Standing Water	16	1995-2011	68	18	-4	41
Flowing Water	16	1995-2011	325	7	-4	18

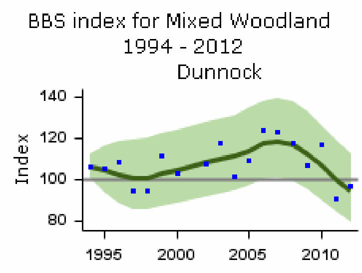
Further information on habitat-specific trends, please follow link here.



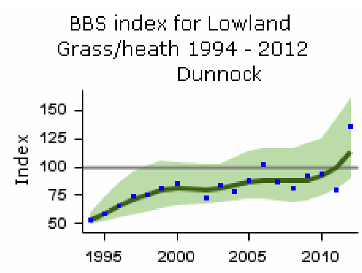
Habitat graph



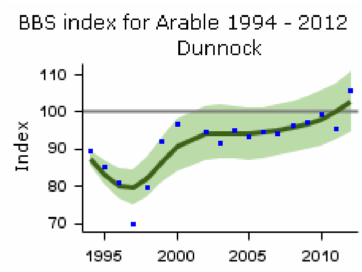
Habitat graph



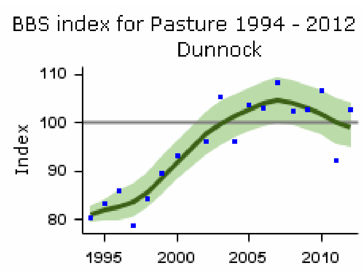
Habitat graph



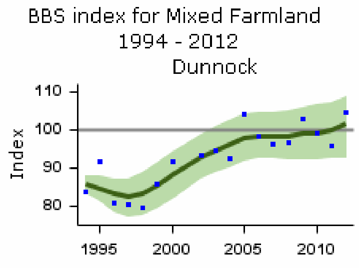
Habitat graph



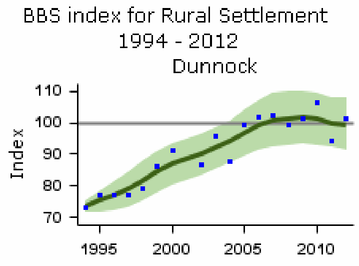
Habitat graph



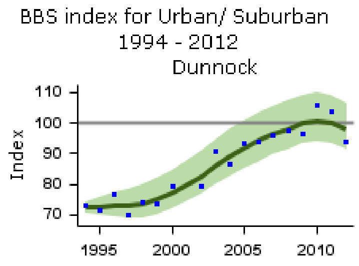
Habitat graph



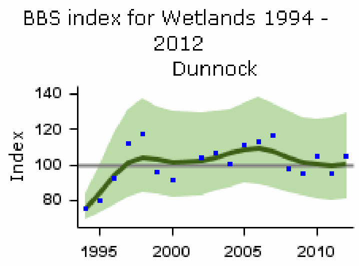
Habitat graph



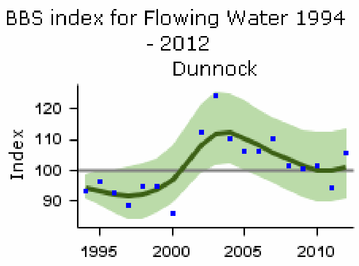
Habitat graph



Habitat graph

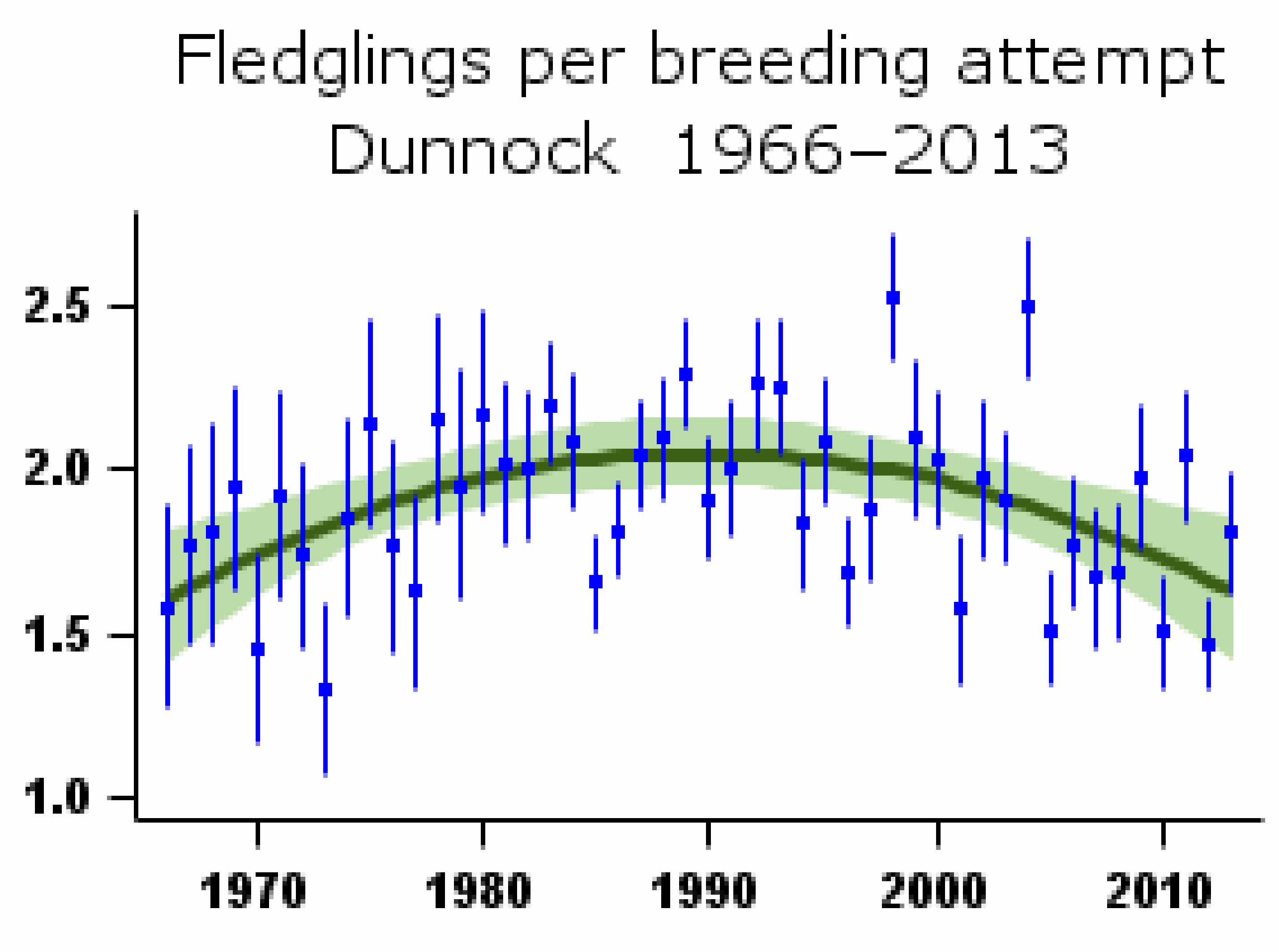


Habitat graph

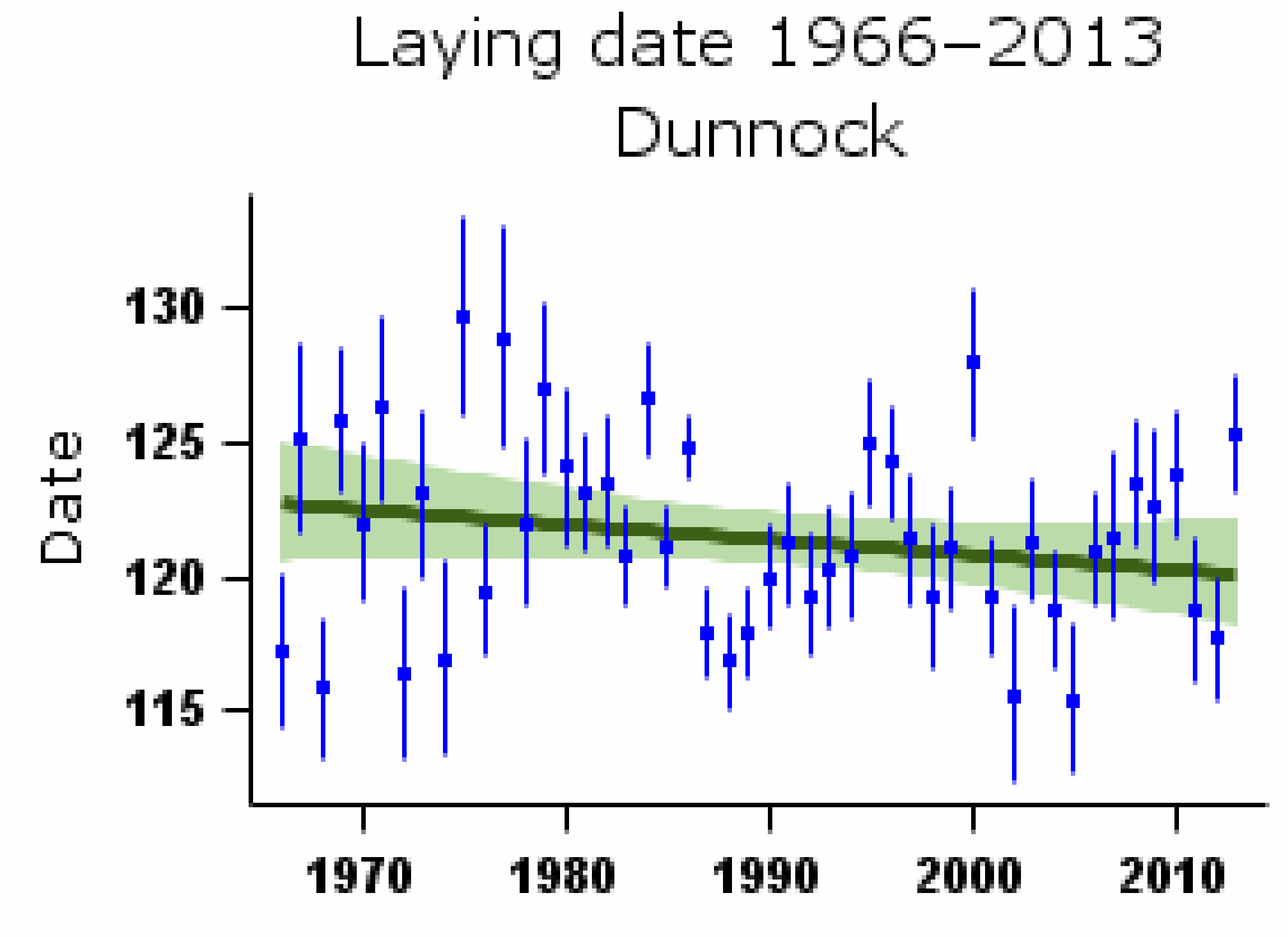


Habitat graph

Demographic trends



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

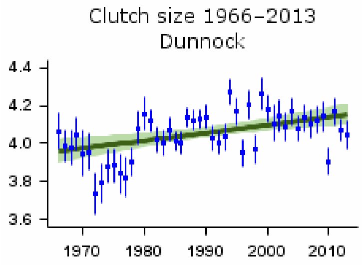


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

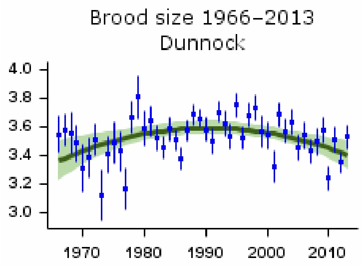
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	121	Curvilinear	1.68 fledglings	1.66 fledglings	-0.9%		
Clutch size	44	1968-2012	112	Linear increase	3.97 eggs	4.15 eggs	4.5%		
Brood size	44	1968-2012	124	Curvilinear	3.40 chicks	3.42 chicks	0.6%		
Nest failure rate at egg stage	44	1968-2012	157	Curvilinear	2.56% nests/day	2.54% nests/day	-0.8%		
Nest failure rate at chick stage	44	1968-2012	126	Curvilinear	2.49% nests/day	2.67% nests/day	7.2%		
Laying date	44	1968-2012	87	None			0 days		
Juvenile to Adult ratio (CES)	28	1984-2012	102	Smoothed trend	101 Index value	100 Index value	-1%		
Juvenile to Adult ratio (CES)	25	1987-2012	108	Smoothed trend	111 Index value	100 Index value	-10%		
Juvenile to Adult ratio (CES)	10	2002-2012	108	Smoothed trend	107 Index value	100 Index value	-6%		
Juvenile to Adult ratio (CES)	5	2007-2012	105	Smoothed trend	88 Index value	100 Index value	13%		

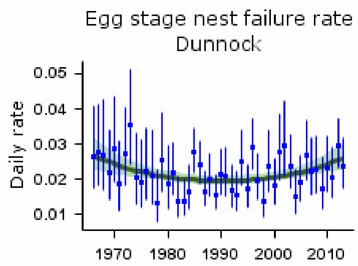
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



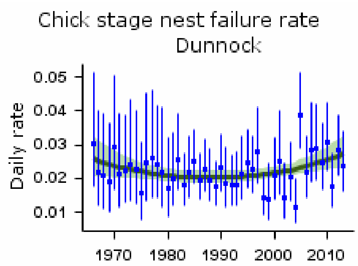
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



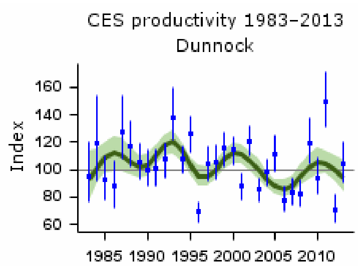
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



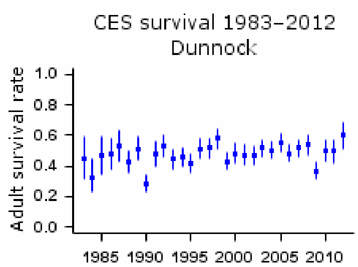
Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



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

Causes of change

The decline of the species between the mid 1970s and mid 1980s is likely to be due to several factors, but strong experimental evidence in farmland areas suggests that this may be linked to reduced winter food availability. This reflects similar results found for other species that suffer a 'hungry gap' in February and March.

Change factor	Primary driver	Secondary driver
Demographic	Overwinter survival	
Ecological	Agricultural intensification	Changes in woodland

Further information on causes of change

The cause of the decline between the mid 1970s and mid 1980s is unknown, but a recently constructed integrated population model suggests that variation in adult survival plays a key role in determining annual population change (Robinson et al. 2014). It is possible that decline was limited to the farmland and woodland habitats that were covered by CBC, prior to the inception of BBS in 1994.

Feeding experiments have revealed that the use Dunnocks make of farmland feeding stations peaks after mid February, as natural food becomes depleted, suggesting that food availability on farmland is a limiting factor in the population (Siriwardena et al. 2007, 2008). This reflects similar results found for other farmland birds that experience a 'hungry gap' in February and March (Siriwardena et al. 2008). Evidence from the study also suggested that breeding abundance was stable where the use of provided food was high, although this may be a density-dependent result as high use occurred at high abundance (Siriwardena et al. 2007).

The CBC trend in woodland plots suggested that the species had declined by 58% between 1966 and 2000 (Fuller et al. 2005). The most likely cause for this decline is loss of understorey due to canopy closure, in the absence of forest management and especially to increasing browsing pressure from deer (Gill & Fuller 2007). In Bradfield Woods, Suffolk, Dunnocks responded negatively to browsing pressure (Holt et al. 2011). Shrub density has been identified as the most important predictor of Dunnock abundance at this site (Fuller & Henderson 1992).

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

House Sparrow

Passer domesticus

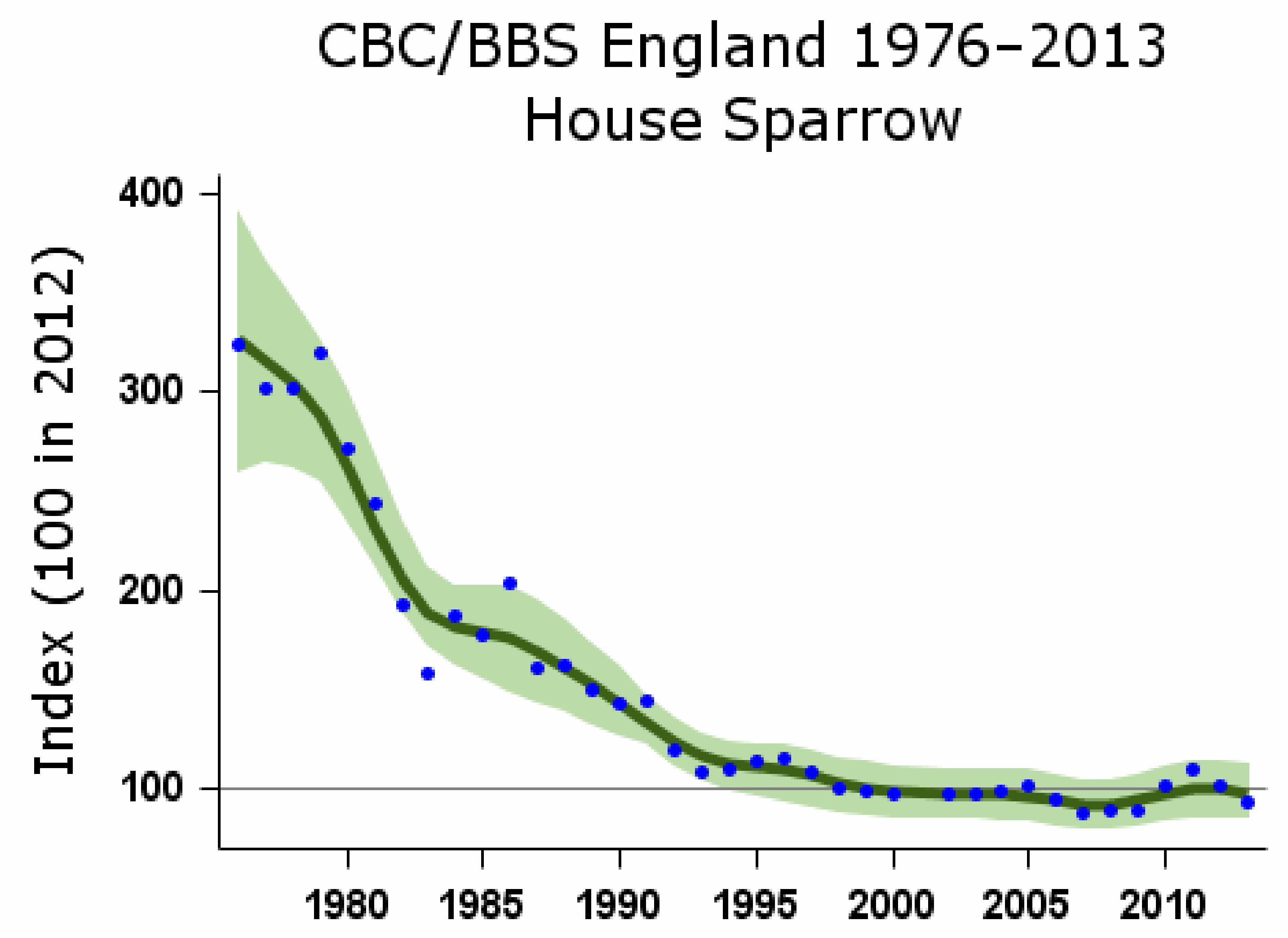
Key facts

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 CBC volunteers could not properly quantify 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 considerable 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 2014a). The European status of this species is no longer considered 'secure' (BirdLife International 2004).



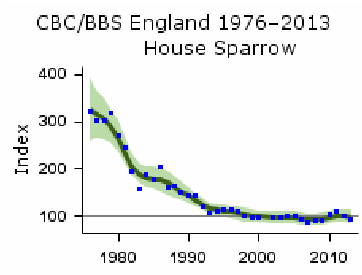
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

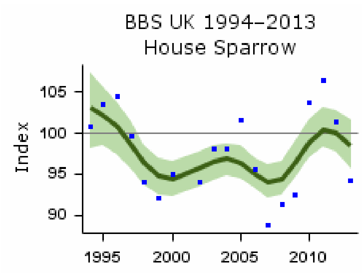
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	35	1977-2012	700	-68	-77	-58	>50	
	25	1987-2012	966	-41	-56	-22	>25	
	10	2002-2012	1460	2	-2	8		
	5	2007-2012	1607	8	4	13		
BBS UK	17	1995-2012	1615	-2	-7	4		
	10	2002-2012	1791	5	0	9		
	5	2007-2012	1966	6	3	10		
BBS England	17	1995-2012	1327	-11	-17	-3		
	10	2002-2012	1460	2	-3	8		
	5	2007-2012	1607	8	4	13		
BBS Scotland	17	1995-2012	97	40	16	79		
	10	2002-2012	108	1	-18	29		
	5	2007-2012	127	-1	-13	13		
BBS Wales	17	1995-2012	125	96	66	131		
	10	2002-2012	143	32	17	47		
	5	2007-2012	146	15	4	26		
BBS N.Ireland	17	1995-2012	54	58	-2	140		
	10	2002-2012	65	25	4	52		
	5	2007-2012	70	11	0	27		

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

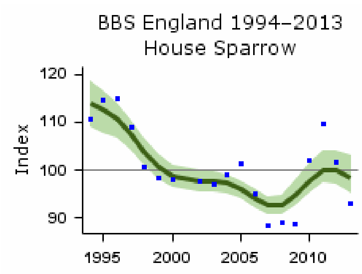
BTO JNCC rspb The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



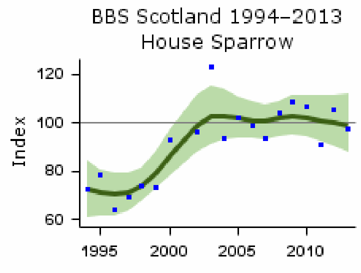
CBC/BBS England graph



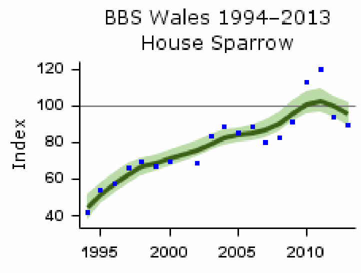
BBS UK graph



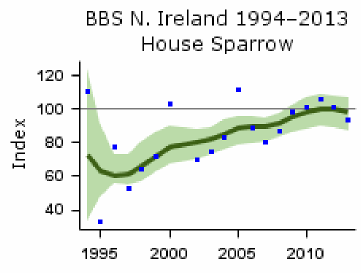
BBS England graph



BBS Scotland graph

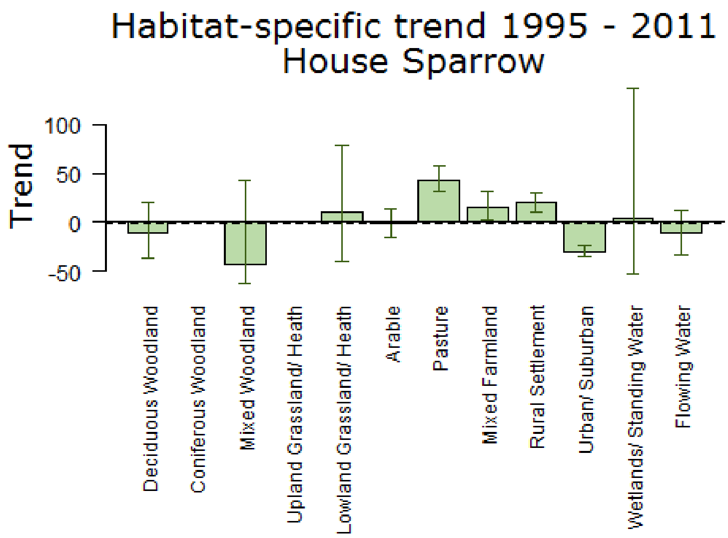


BBS Wales graph



BBS N.Ireland graph

Population trends by habitat



Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

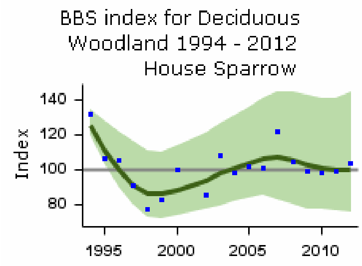
Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

More on habitat trends

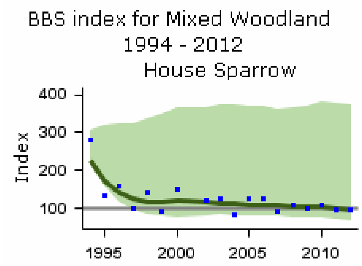
Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	200	-10	-36	21

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Mixed Woodland	16	1995-2011	63	42	62	43
Lowland Grassland/ Heath	16	1995-2011	33	11	-40	78
Arable	16	1995-2011	321	-1	-15	13
Pasture	16	1995-2011	754	43	32	57
Mixed Farmland	16	1995-2011	360	16	3	31
Rural Settlement	16	1995-2011	661	21	11	30
Urban/ Suburban	16	1995-2011	414	-30	-35	-23
Wetlands/ Standing Water	16	1995-2011	37	4	-52	137
Flowing Water	16	1995-2011	180	-11	-34	12

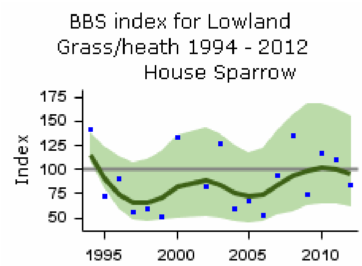
Further information on habitat-specific trends, please follow link here.



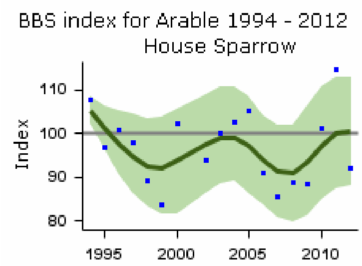
Habitat graph



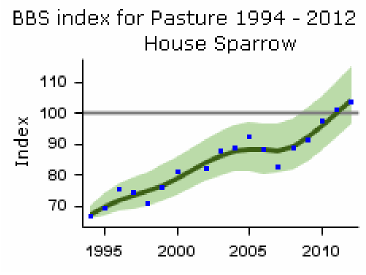
Habitat graph



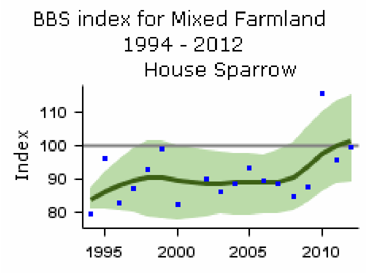
Habitat graph



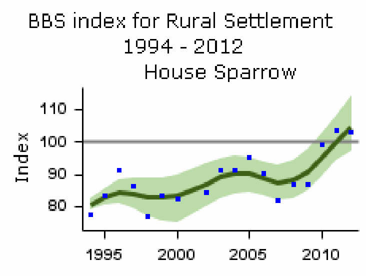
Habitat graph



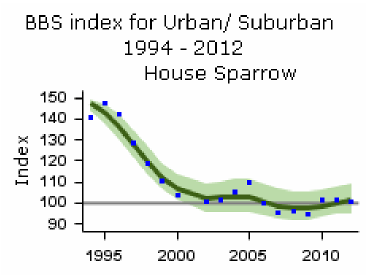
Habitat graph



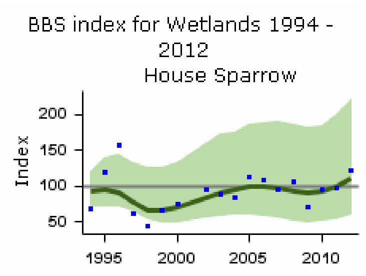
Habitat graph



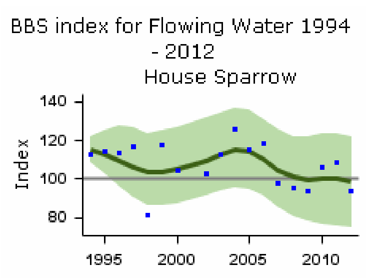
Habitat graph



Habitat graph

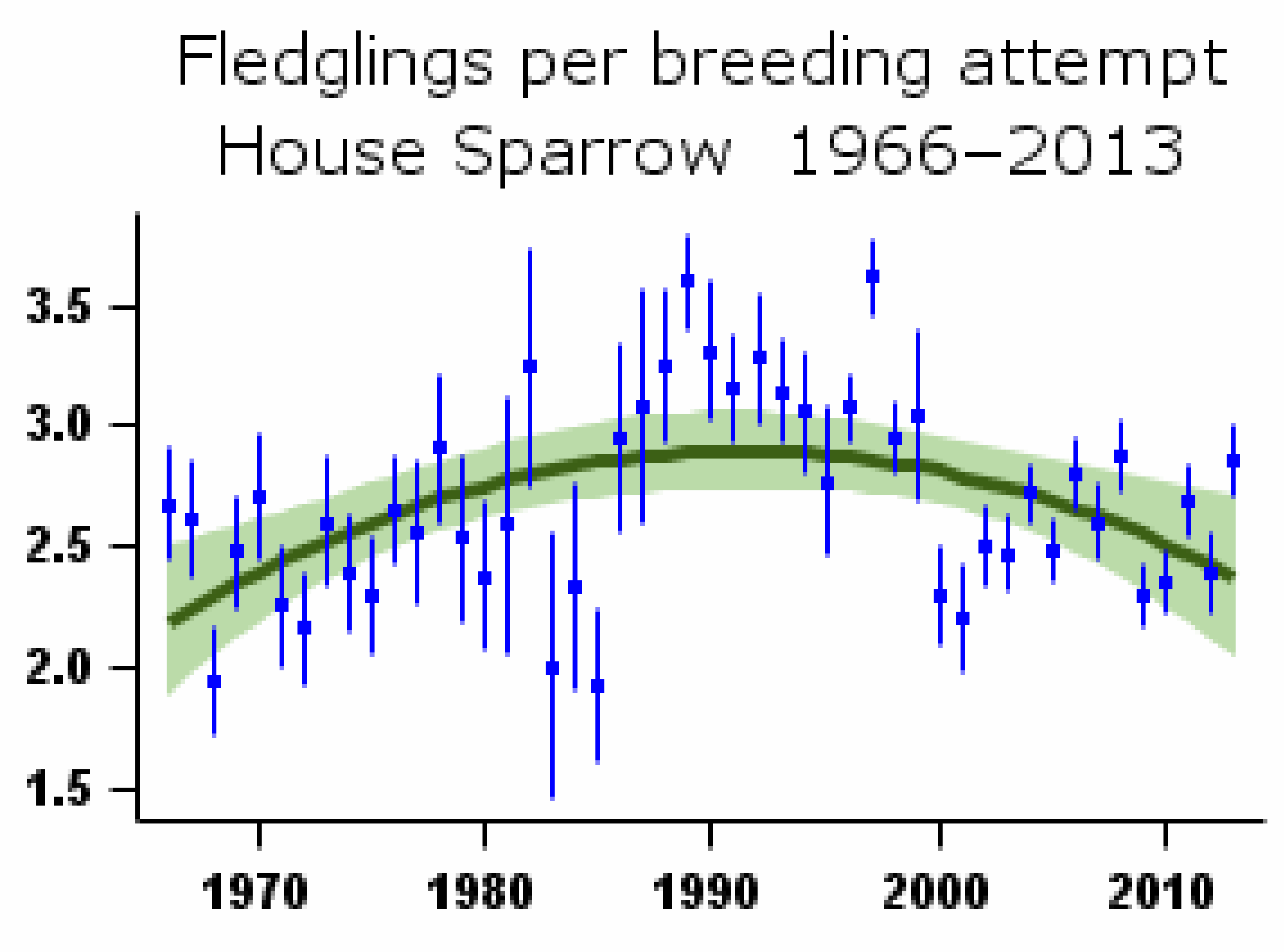


Habitat graph

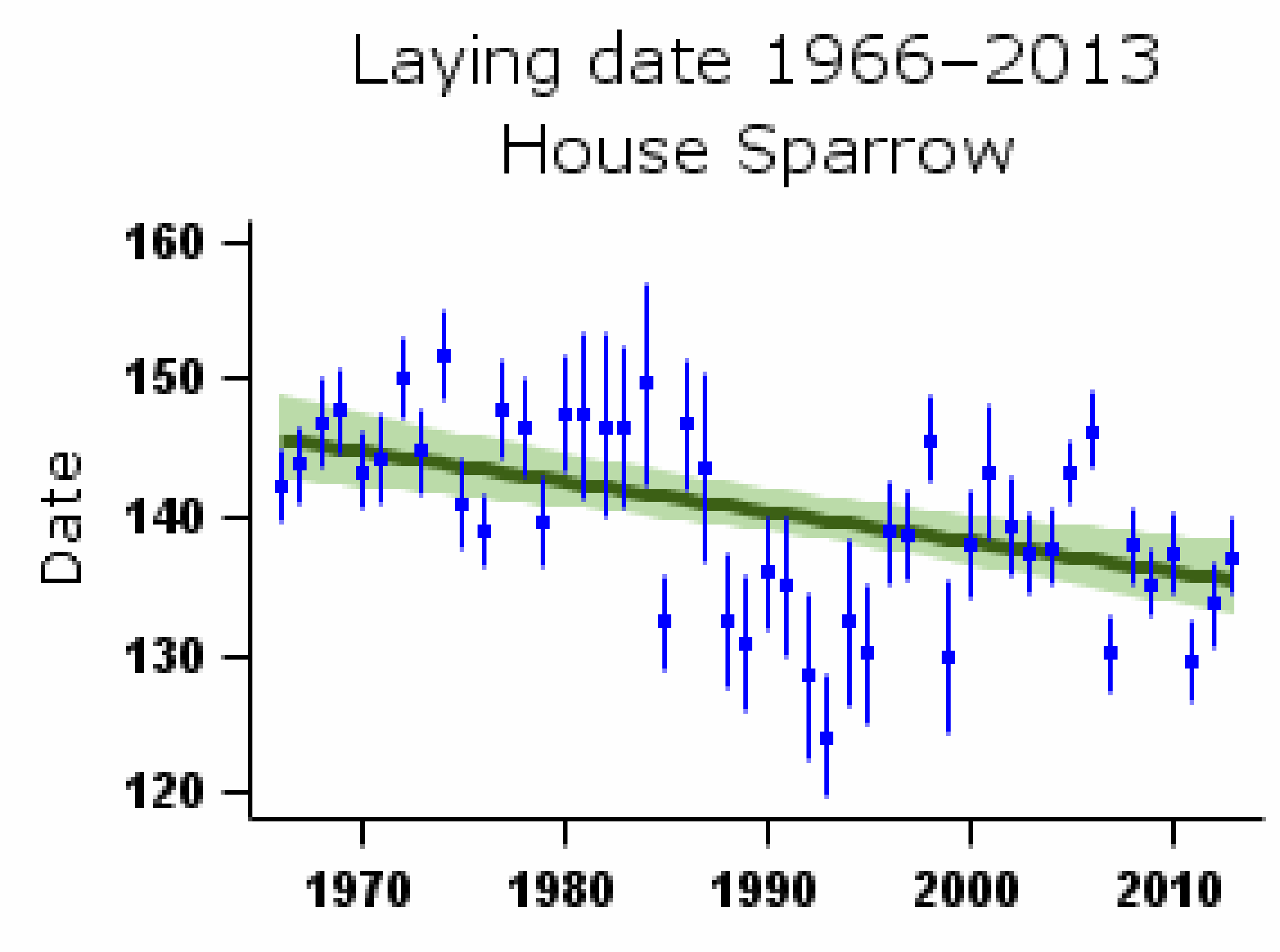


Habitat graph

Demographic trends



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

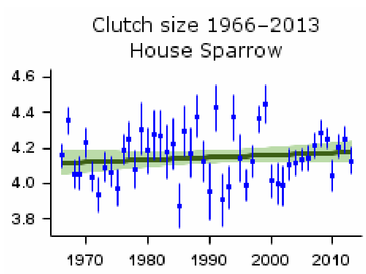


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

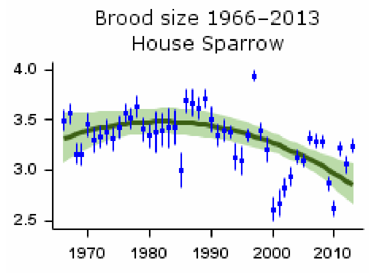
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	101	Curvilinear	2.30 fledglings	2.43 fledglings	5.6%		
Clutch size	44	1968-2012	83	None					
Brood size	44	1968-2012	160	Curvilinear	3.35 chicks	2.89 chicks	-13.8%		
Nest failure rate at egg stage	44	1968-2012	114	Linear decline	1.06% nests/day	0.40% nests/day	-62.3%		
Nest failure rate at chick stage	44	1968-2012	115	Curvilinear	1.52% nests/day	0.87% nests/day	-42.8%		
Laying date	44	1968-2012	64	Linear decline	May 25	May 16	-9 days		

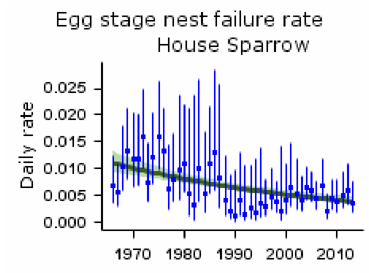
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



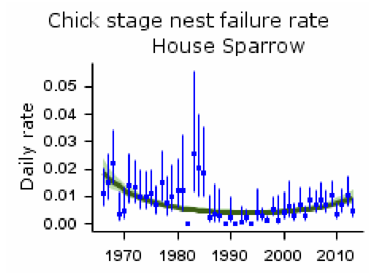
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



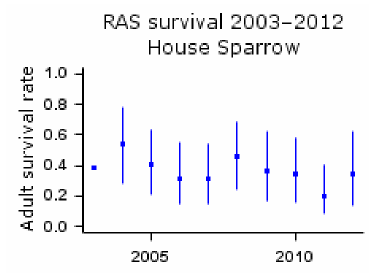
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



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

Causes of change

There is evidence that changes in survival rates due to lack of food 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 since 1968, brood size has decreased (see above) but there has also been a major decrease in nest failure rates at the egg and chick stages, 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. That survival, especially of adult birds, appeared to make the largest contribution to annual population change was also found by Robinson et al. (2014). Crick & Siriwardena (2002), using NRS data, showed that breeding performance per nesting attempt had increased and was positively correlated with population growth rate in the wider countryside (although there was no such correlation in gardens). Analysis of Garden BirdWatch data found higher seasonal peak counts, however, relative to pre-breeding numbers, in the north and west of Britain than in the east and south where population decline is strongest, thus indicating that breeding productivity is influencing population trends (Morrison et al. 2014).

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 seed available to farmland populations of House Sparrows during winter, 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 since the 1970s (O'Connor & Shrubb 1986). The move towards autumn-sowing of 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-sown 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 widespread 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. Supplying mealworms for garden-nesting House Sparrows substantially improved breeding success (Peach et al. 2014)

Negative correlations between indices of Sparrowhawk presence during its post-organochlorine increase 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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Tree Sparrow

Passer montanus

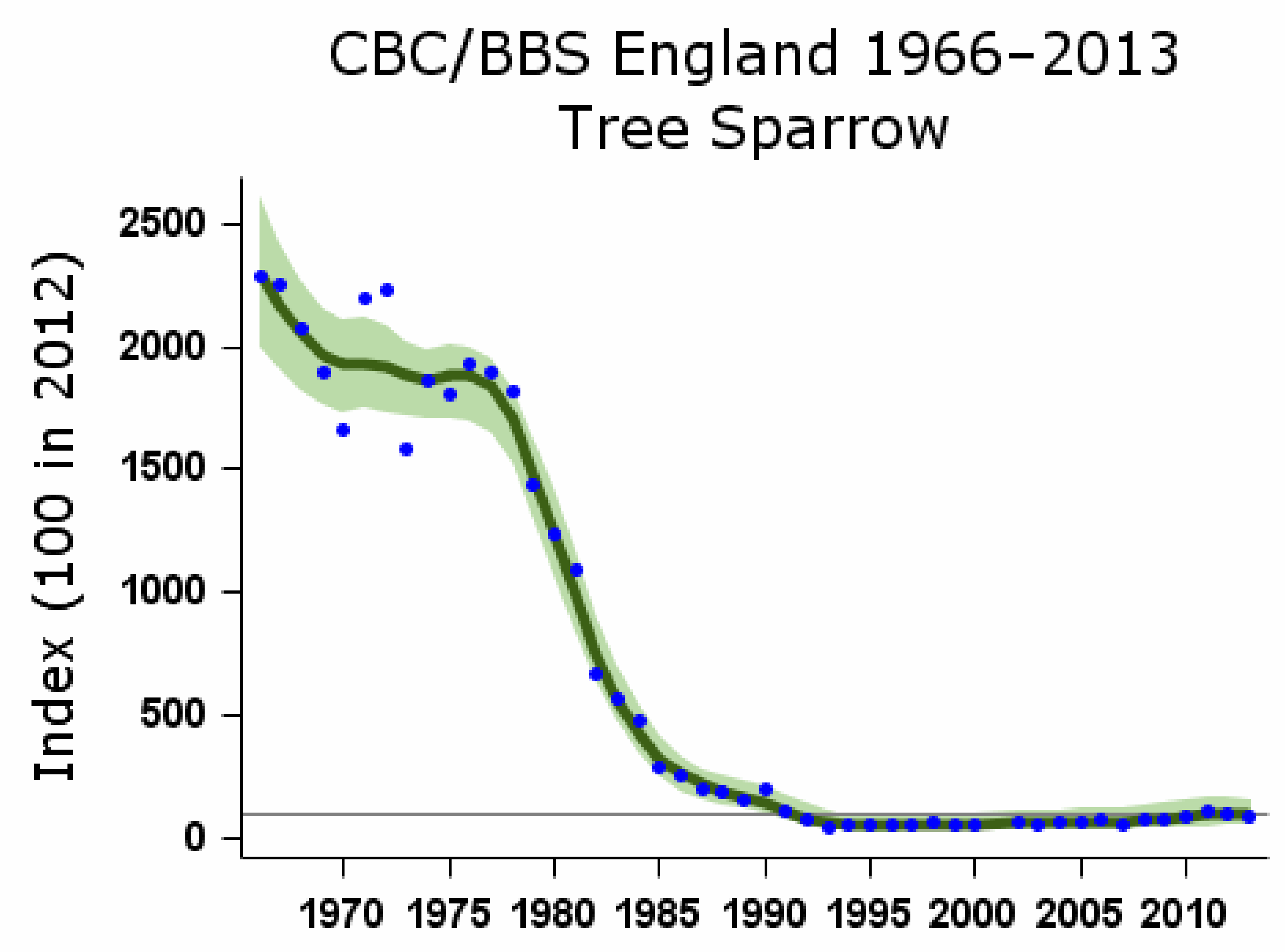
Key facts

Conservation listings:	Europe: SPEC category 3 (declining) (BiE04) UK: red (>50% population decline) (BoCC3) UK Biodiversity Action Plan: 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 nose-dived 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 20 in the 1970s, and any recovery therefore has a very long way to go. Clear range contractions occurred between the first two breeding atlas periods (Gibbons et al. 1993), and have accelerated subsequently: Tree Sparrows have now withdrawn completely from some southern and western regions of Britain, but conversely have spread in Northern Ireland (Balmer et al. 2013). 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 a widespread moderate decline across Europe since 1980 (PECBMS 2014a).



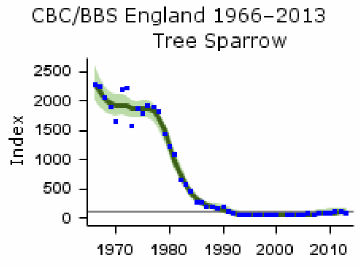
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

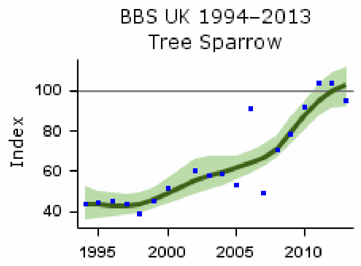
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	45	1967-2012	96	-95	-98	-91	>50	
	25	1987-2012	111	-55	-77	-15	>50	Small CBC sample
	10	2002-2012	155	53	27	83		
	5	2007-2012	179	39	22	56		
BBS UK	17	1995-2012	178	128	82	181		
	10	2002-2012	199	79	36	122		
	5	2007-2012	234	50	27	69		
BBS England	17	1995-2012	142	81	47	129		
	10	2002-2012	155	53	29	87		
	5	2007-2012	179	38	19	57		

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

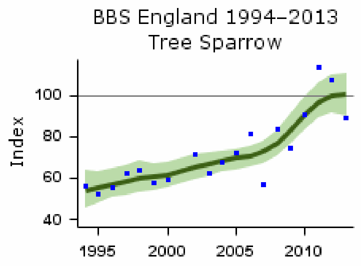
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



CBC/BBS England graph

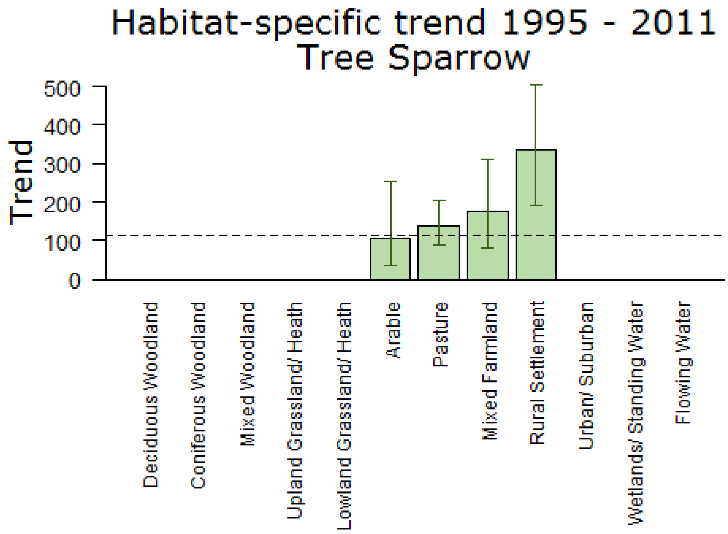


BBS UK graph



BBS England graph

Population trends by habitat



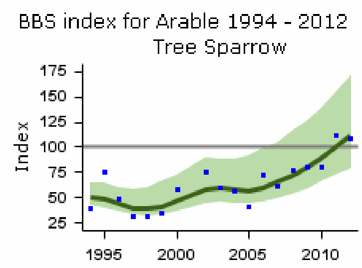
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

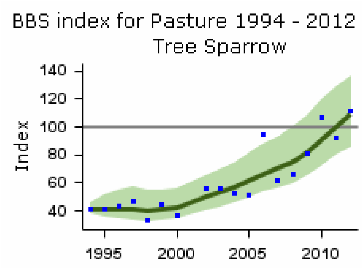
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Arable	16	1995-2011	55	106	35	254
Pasture	16	1995-2011	72	141	88	206
Mixed Farmland	16	1995-2011	51	177	82	313
Rural Settlement	16	1995-2011	48	336	191	504

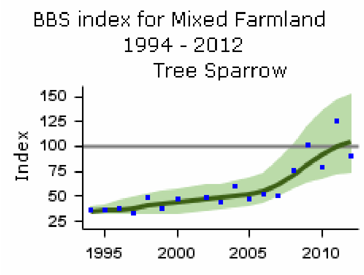
Further information on habitat-specific trends, please follow link here.



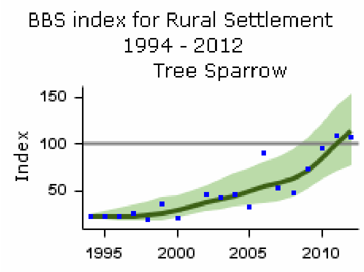
Habitat graph



Habitat graph

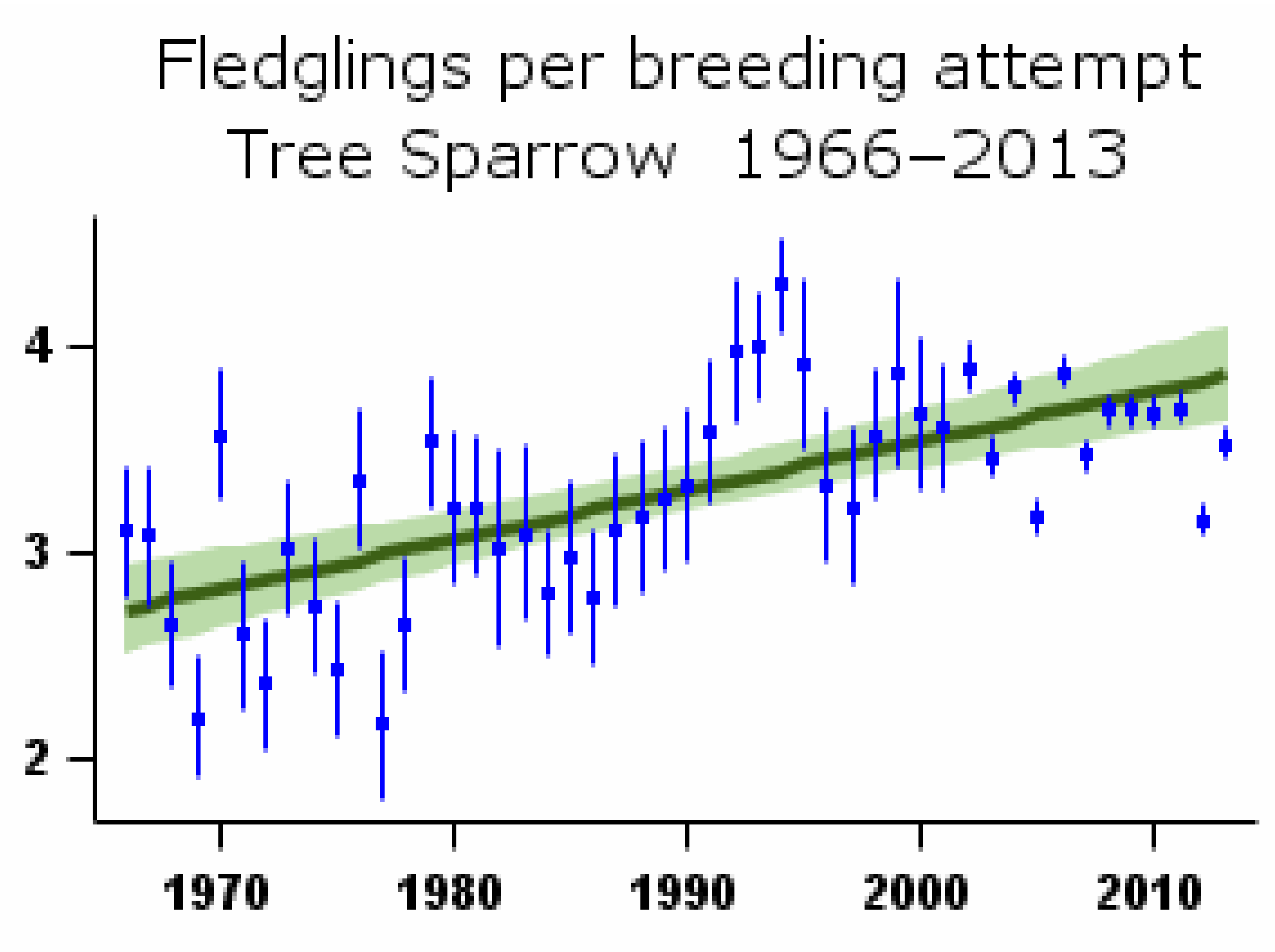


Habitat graph

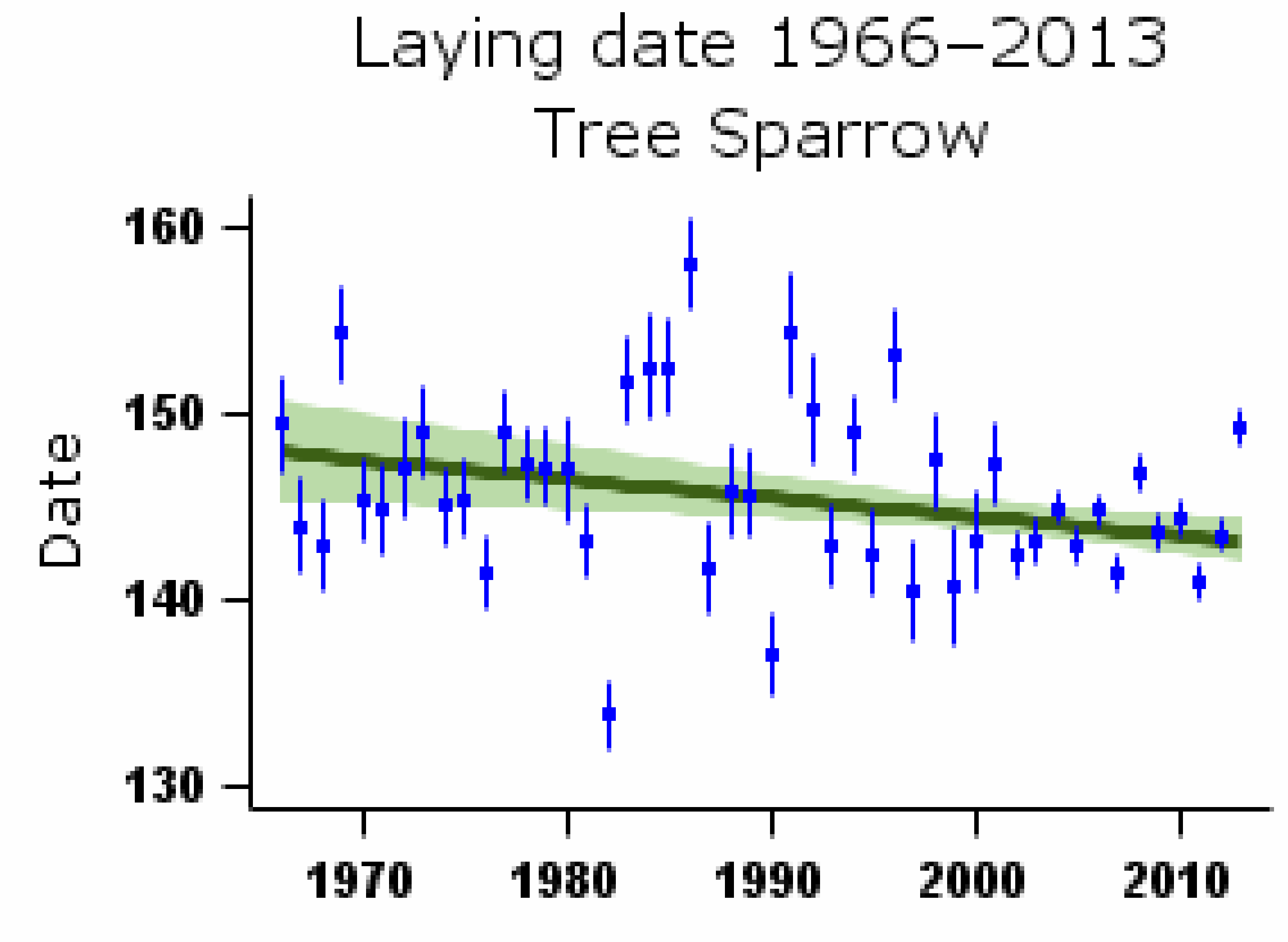


Habitat graph

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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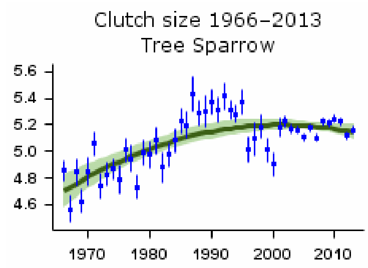
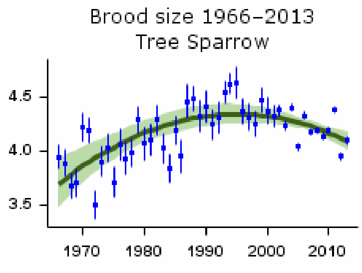
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	263	Linear increase	2.77 fledglings	3.83 fledglings	38.1%		
Clutch size	44	1968-2012	291	Curvilinear	4.76 eggs	5.15 eggs	8.3%		
Brood size	44	1968-2012	387	Curvilinear	3.78 chicks	4.11 chicks	8.8%		
Nest failure rate at egg stage	44	1968-2012	382	Linear decline	0.82% nests/day	0.33% nests/day	-59.8%		
Nest failure rate at chick stage	44	1968-2012	263	Linear decline	1.41% nests/day	0.60% nests/day	-57.4%		
Laying date	44	1968-2012	292	Linear decline	May 28	May 23	-5 days		

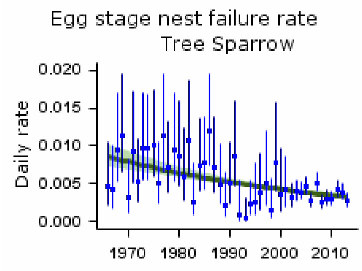
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



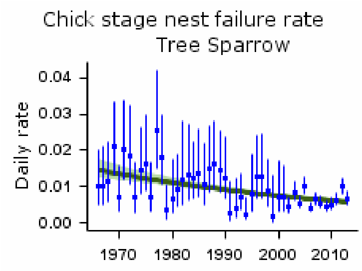
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



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 declines in daily failure rate at both the nest and chick stages and increases in clutch and brood sizes. 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 such ideas 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 shortage of food. In winter in Scotland (Hancock & Wilson 2003), the highest densities of Tree Sparrows were recorded in cereal stubble fields (undersown with grass) and weedy brassica fodder 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 areas provisioned by RSPB Bird Aid, this may be due to the fact that the BBS trends for this species are increasing; therefore winter food may not currently be limiting, as the remaining populations are in small remnants of suitable habitat and many are subject to active conservation action (e.g. provision of nest boxes).

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 UK farmland that were formerly occupied 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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Yellow Wagtail

Motacilla flava

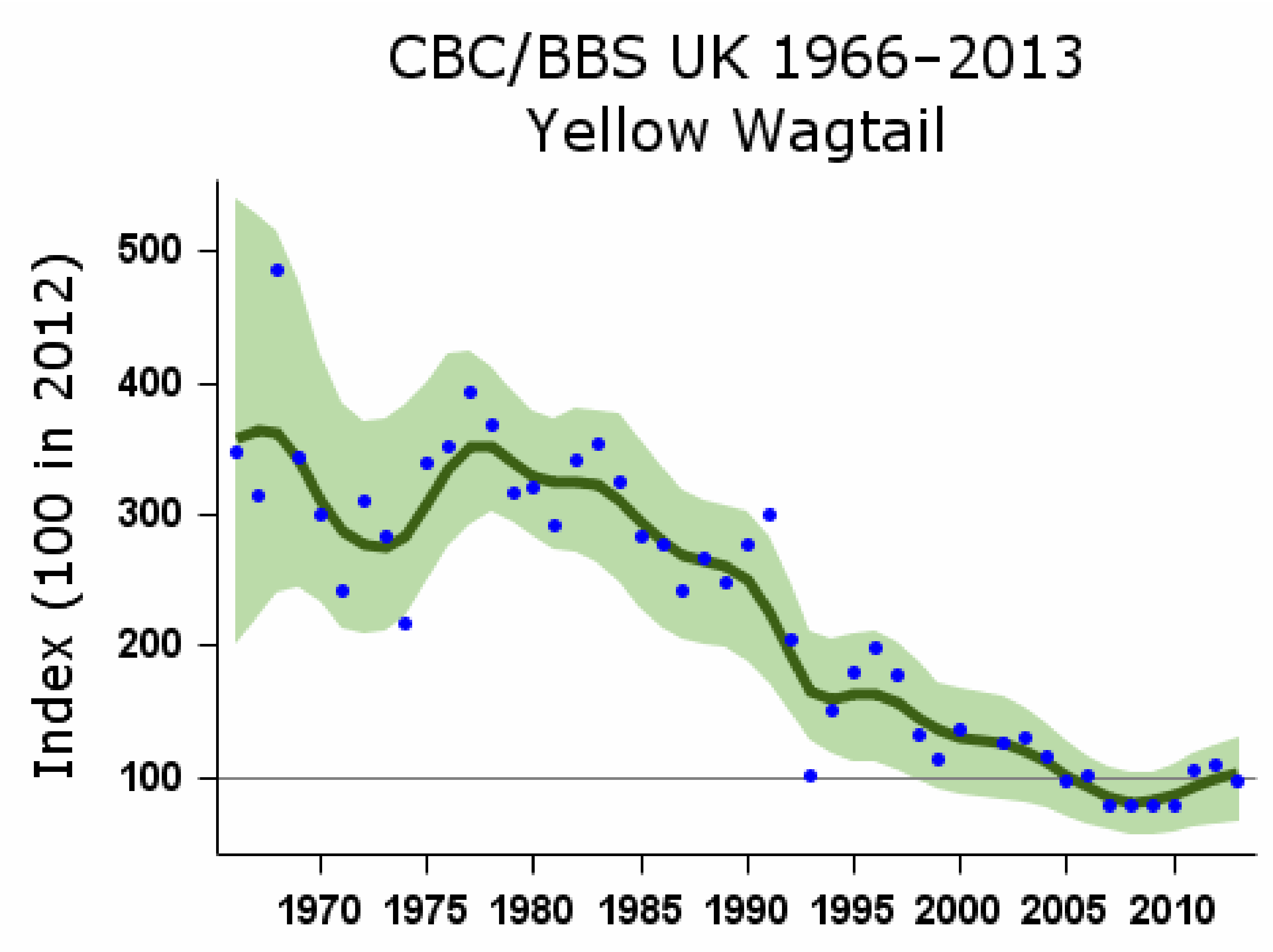
Key facts

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 world population of the distinctive race flavissima, so population changes in the UK are of global conservation significance. Yellow Wagtails have been in rapid 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 was moved to the red list in 2009 (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. Further range contraction has occurred extensively since then, especially in the west and south and in parts of East Anglia (Balmer et al. 2013). The significant decrease in brood size warrants NRS concern (Leech & Barimore 2008). The European trend, which comprises several races of the species, has been of moderate decline since 1980, though with little change since 1990 (PECBMS 2014a).



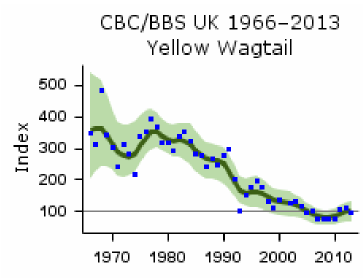
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

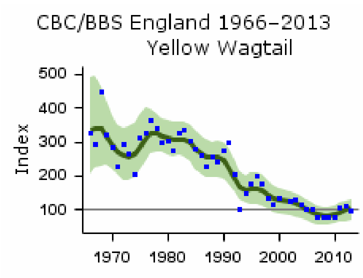
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	45	1967-2012	82	-73	-89	-39	>50	
	25	1987-2012	123	-63	-76	-49	>50	Small CBC sample
	10	2002-2012	155	-21	-32	-5		
	5	2007-2012	159	17	1	35		
CBC/BBS England	45	1967-2012	81	-71	-86	-44	>50	
	25	1987-2012	120	-61	-74	-48	>50	Small CBC sample
	10	2002-2012	151	-20	-32	-7		
	5	2007-2012	155	17	-2	35		
WBS/WBBS waterways	37	1975-2012	24	-96	-99	-93	>50	
	25	1987-2012	22	-93	-97	-89	>50	
	10	2002-2012	22	-54	-73	-25	>50	
	5	2007-2012	17	-29	-52	-2	>25	Small sample
BBS UK	17	1995-2012	158	-43	-51	-32	>25	
	10	2002-2012	155	-20	-31	-7		
	5	2007-2012	159	16	0	32		
BBS England	17	1995-2012	155	-43	-52	-33	>25	
	10	2002-2012	151	-20	-32	-6		
	5	2007-2012	155	15	-2	34		

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

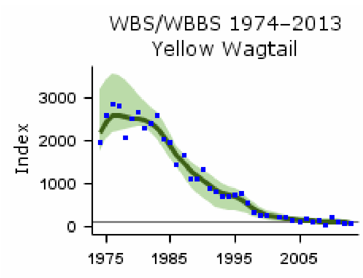
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



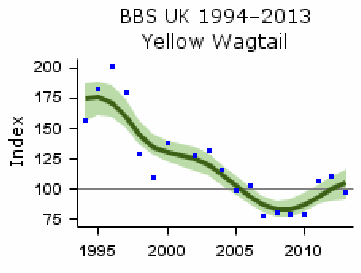
CBC/BBS UK graph



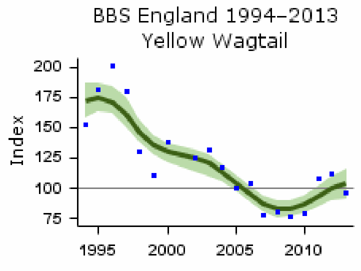
CBC/BBS England graph



WBS/WBBS waterways graph

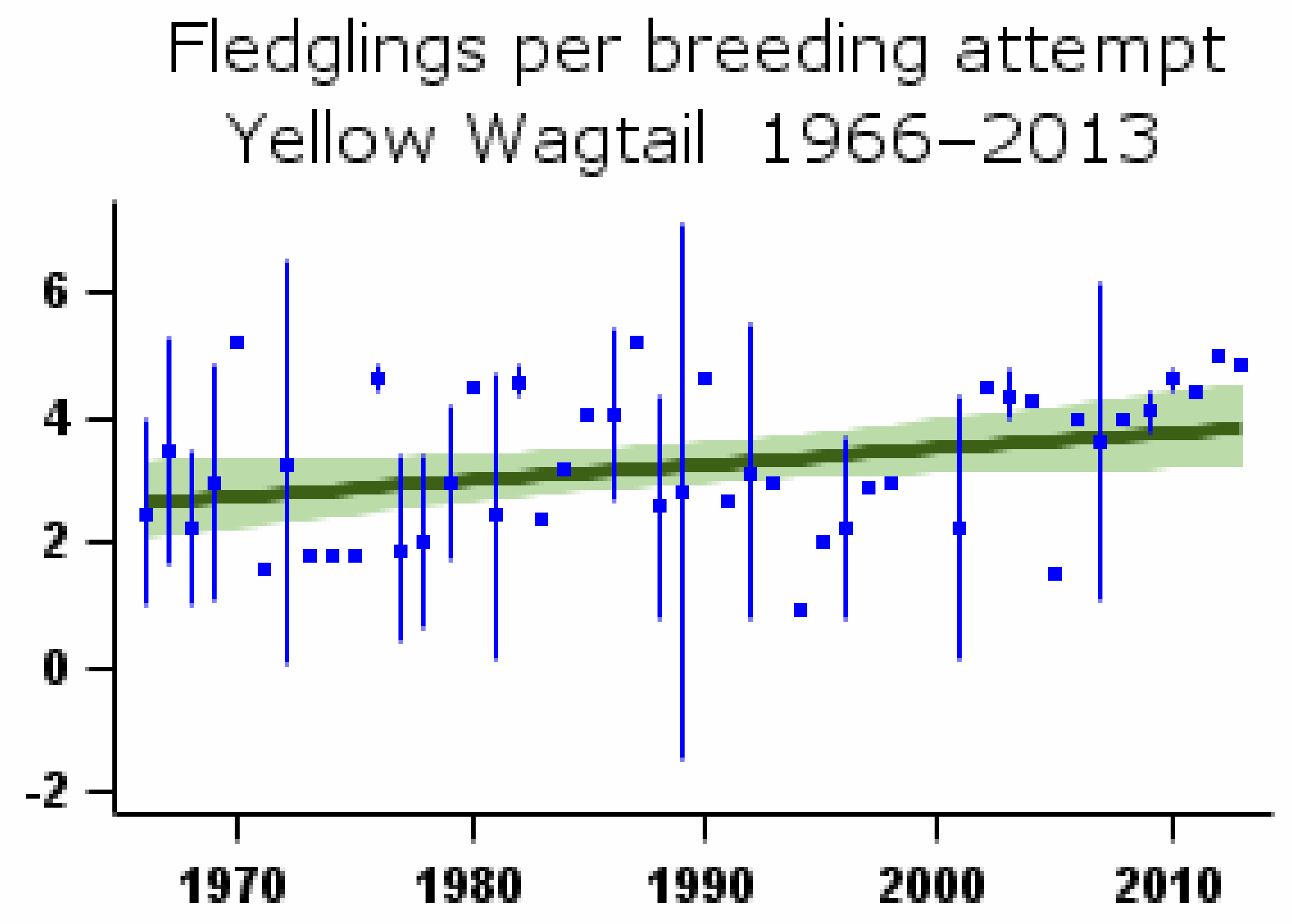


BBS UK graph

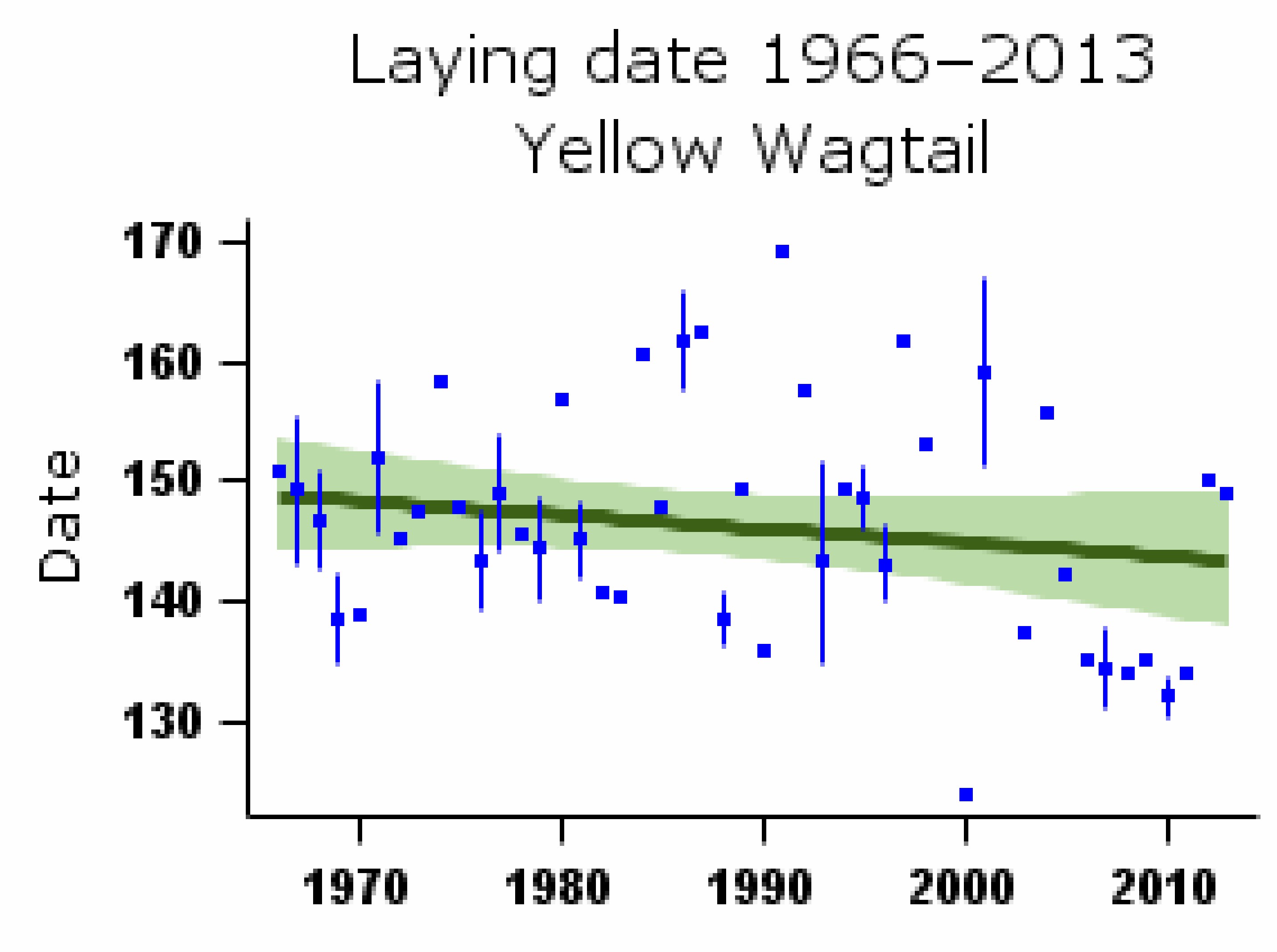


BBS England graph

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

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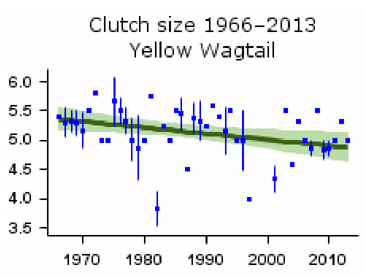
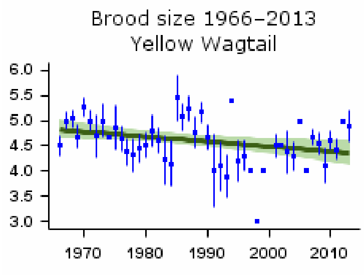
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	6	Linear increase	2.70 fledglings	3.82 fledglings	41.4%		
Clutch size	44	1968-2012	5	Linear decline	5.34 eggs	4.89 eggs	-8.5%		Small sample
Brood size	44	1968-2012	12	Linear decline	4.80 chicks	4.37 chicks	-9.0%		Small sample
Nest failure rate at egg stage	44	1968-2012	6	None					Small sample
Nest failure rate at chick stage	44	1968-2012	9	Linear decline	2.77% nests/day	0.21% nests/day	-92.4%		Small sample
Laying date	44	1968-2012	6	None			0 days		Small sample

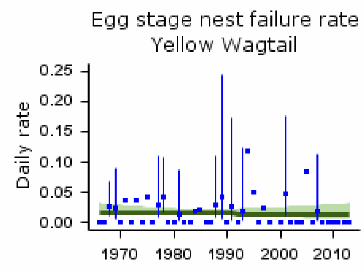
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



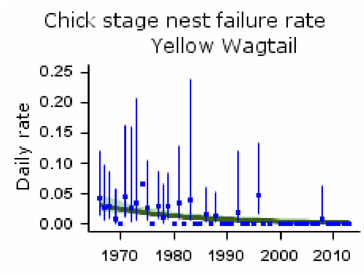
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



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

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 strongest 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 indecipherable.

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 does not breed on Scottish farmland, 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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Grey Wagtail

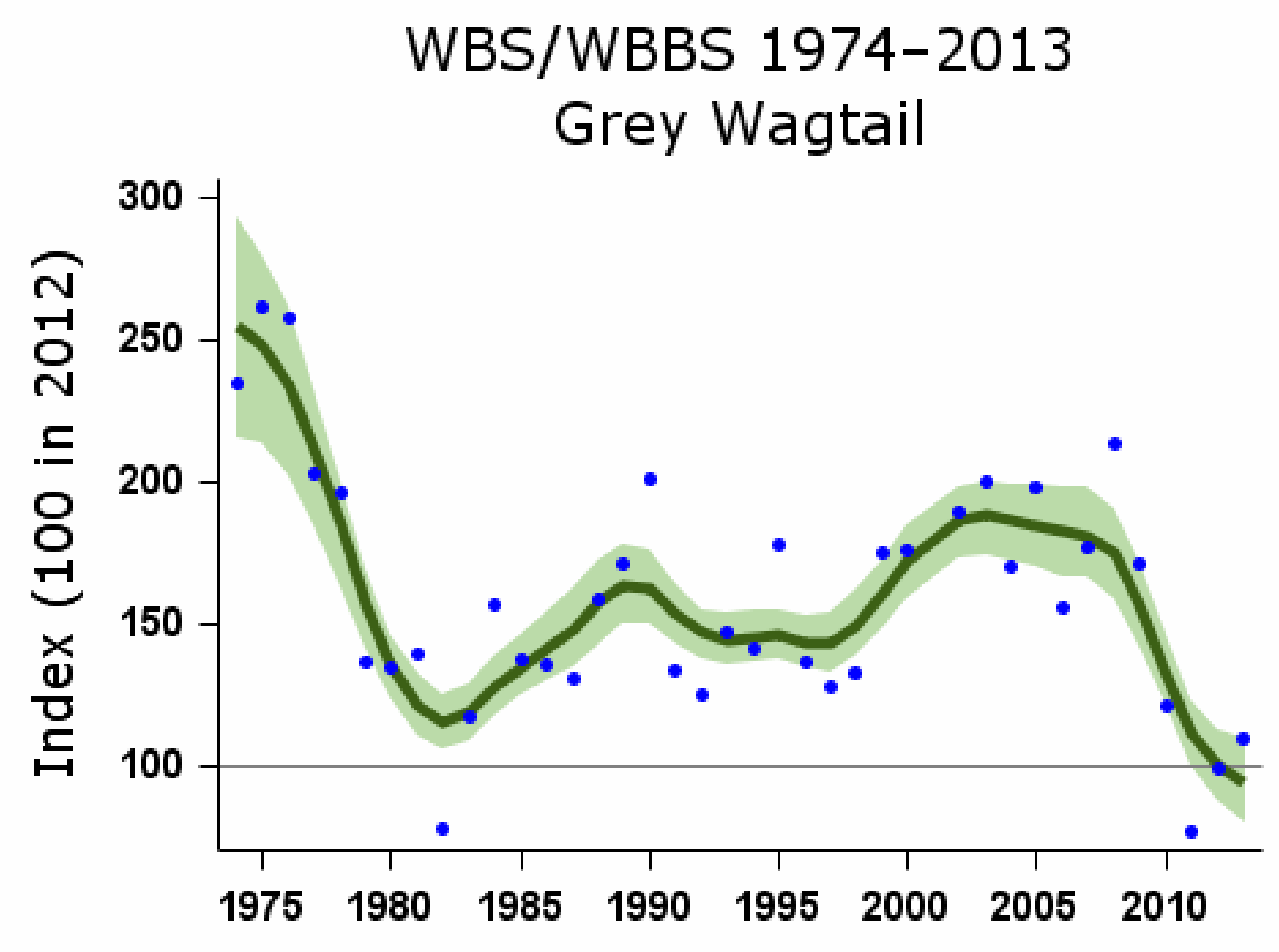
Motacilla cinerea

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: rapid 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. The BBS trend matches WBS/WBBS closely: there was an initial increase but since 2002 the trend has been steeply downward, especially in Scotland. 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, suggesting that reduced survival is the likely driver of decline. Numbers have shown widespread moderate decrease across Europe since 1990 (PECBMS 2014a).



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

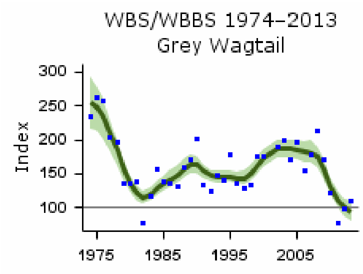
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
WBS/WBBS waterways	37	1975-2012	96	-60	-67	-48	>50	
	25	1987-2012	117	-33	-43	-19	>25	
	10	2002-2012	164	-47	-53	-38	>25	
	5	2007-2012	135	-45	-52	-36	>25	

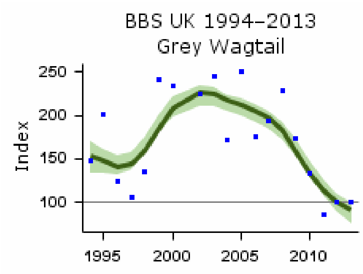
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	17	1995-2012	219	-32	-44	-20	>25	
	10	2002-2012	253	-56	-61	-49	>50	
	5	2007-2012	265	-49	-55	-42	>25	
BBS England	17	1995-2012	147	-17	-31	0		
	10	2002-2012	174	-44	-51	-34	>25	
	5	2007-2012	188	-35	-43	-25	>25	
BBS Scotland	17	1995-2012	32	-41	-60	-8	>25	
	10	2002-2012	35	-69	-79	-53	>50	
	5	2007-2012	38	-59	-73	-41	>50	

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

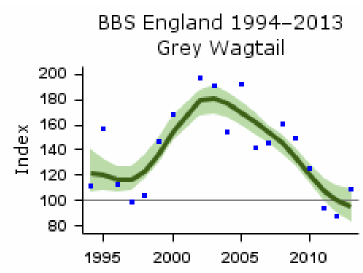
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



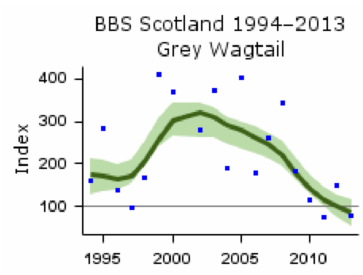
WBS/WBBS waterways graph



BBS UK graph

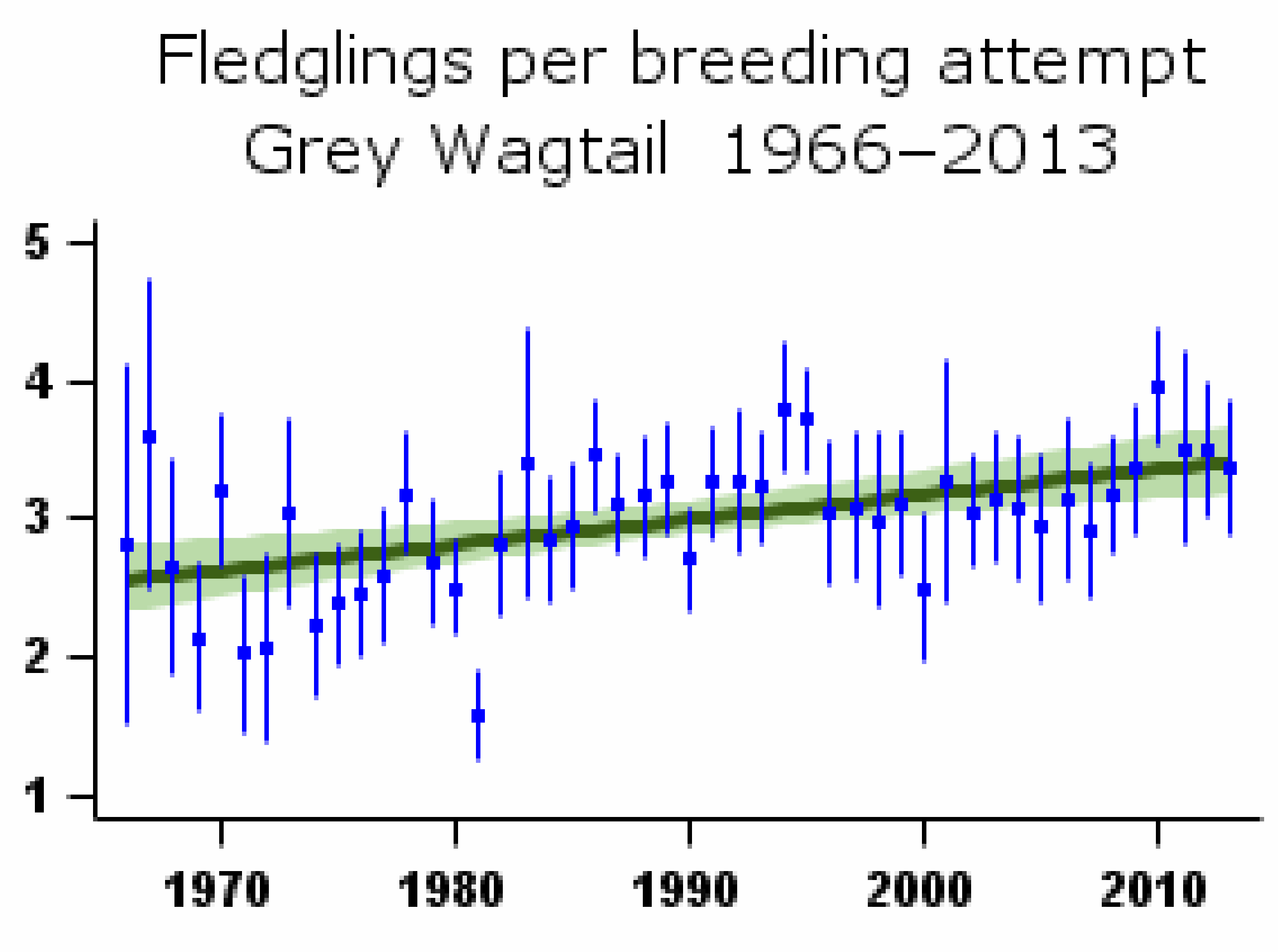


BBS England graph

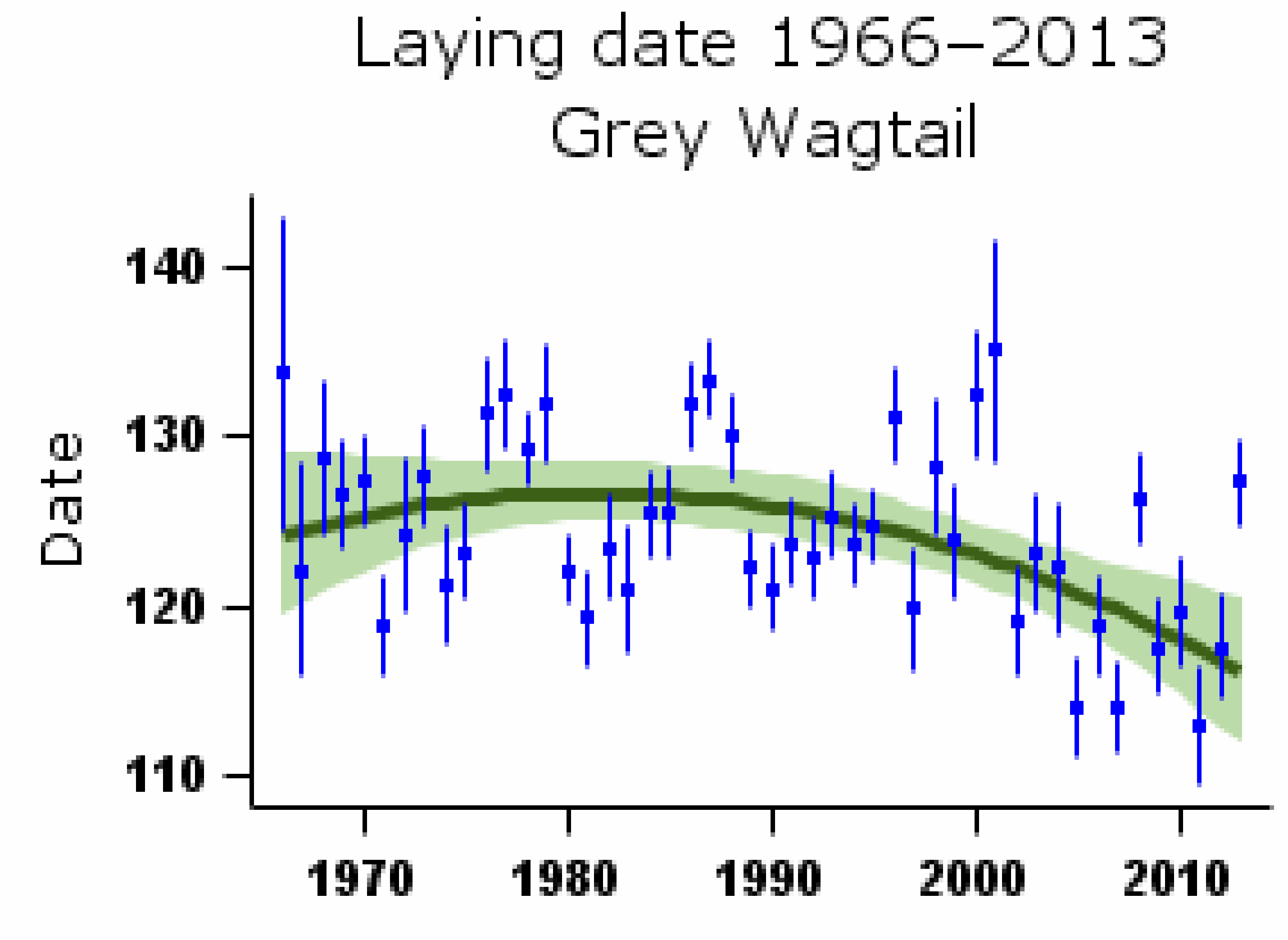


BBS Scotland graph

Demographic trends



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

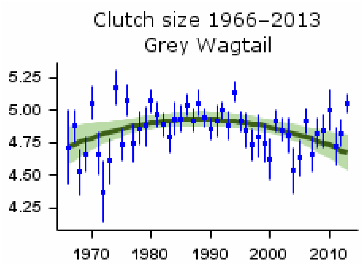


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

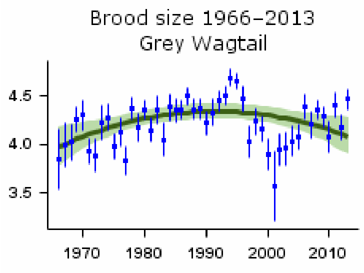
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	54	Linear increase	2.60 fledglings	3.40 fledglings	30.8%		
Clutch size	44	1968-2012	38	Curvilinear	4.75 eggs	4.69 eggs	-1.4%		
Brood size	44	1968-2012	80	Curvilinear	4.03 chicks	4.11 chicks	1.9%		
Nest failure rate at egg stage	44	1968-2012	58	Linear decline	1.78% nests/day	0.94% nests/day	-47.2%		
Nest failure rate at chick stage	44	1968-2012	56	Linear decline	2.20% nests/day	0.72% nests/day	-67.3%		
Laying date	44	1968-2012	61	Curvilinear	May 5	Apr 27	-8 days		

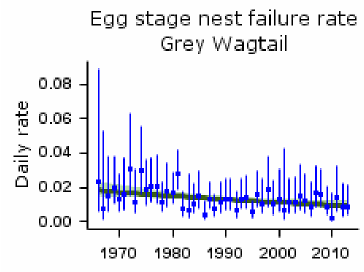
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



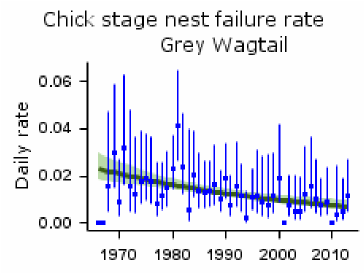
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



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

Causes of change

Causes of population decline and fluctuation may be related to survival rates of juveniles or adults. At present there are not enough data to investigate this idea and more targeted studies, for example RAS projects or analyses to relate survival to weather variables, are needed.

Change factor	Primary driver	Secondary driver
Demographic	Overwinter survival	
Ecological	Unknown	

Further information on causes of change

Research has focused on the possible effects of water quality on this species. No correlation was found between Grey Wagtail breeding density and pH of streams in Scotland (Vickery 1991), a result supported by other authors who established that river acidity was less important than stream width, area of riffle and presence of bankside trees in influencing Grey Wagtail presence (Ormerod & Tyler 1987a). Laying date was three weeks later in acidic rivers than elsewhere in Wales, however, although clutch size, hatching success and brood size did not vary (Ormerod & Tyler 1991).

The species can feed in a range of habitats adjacent to rivers (Vickery 1991, Ormerod & Tyler 1987b) and do not rely on aquatic food sources (Ormerod & Tyler 1991): this may explain why they are less influenced by acidity of rivers, which has been associated with lower invertebrate abundance but not with Grey Wagtail abundance (Ormerod & Tyler 1991). Unhatched eggs collected over two years in Wales, Scotland and southwest Ireland did not contain toxic level of PCBs (Ormerod & Tyler 1992).

Causes of population decline and fluctuation appear to be related to survival rates. Targeted studies, for example RAS projects or analyses to relate survival to weather variables, have the potential to shed light on the population changes of this species.

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Pied/White Wagtail

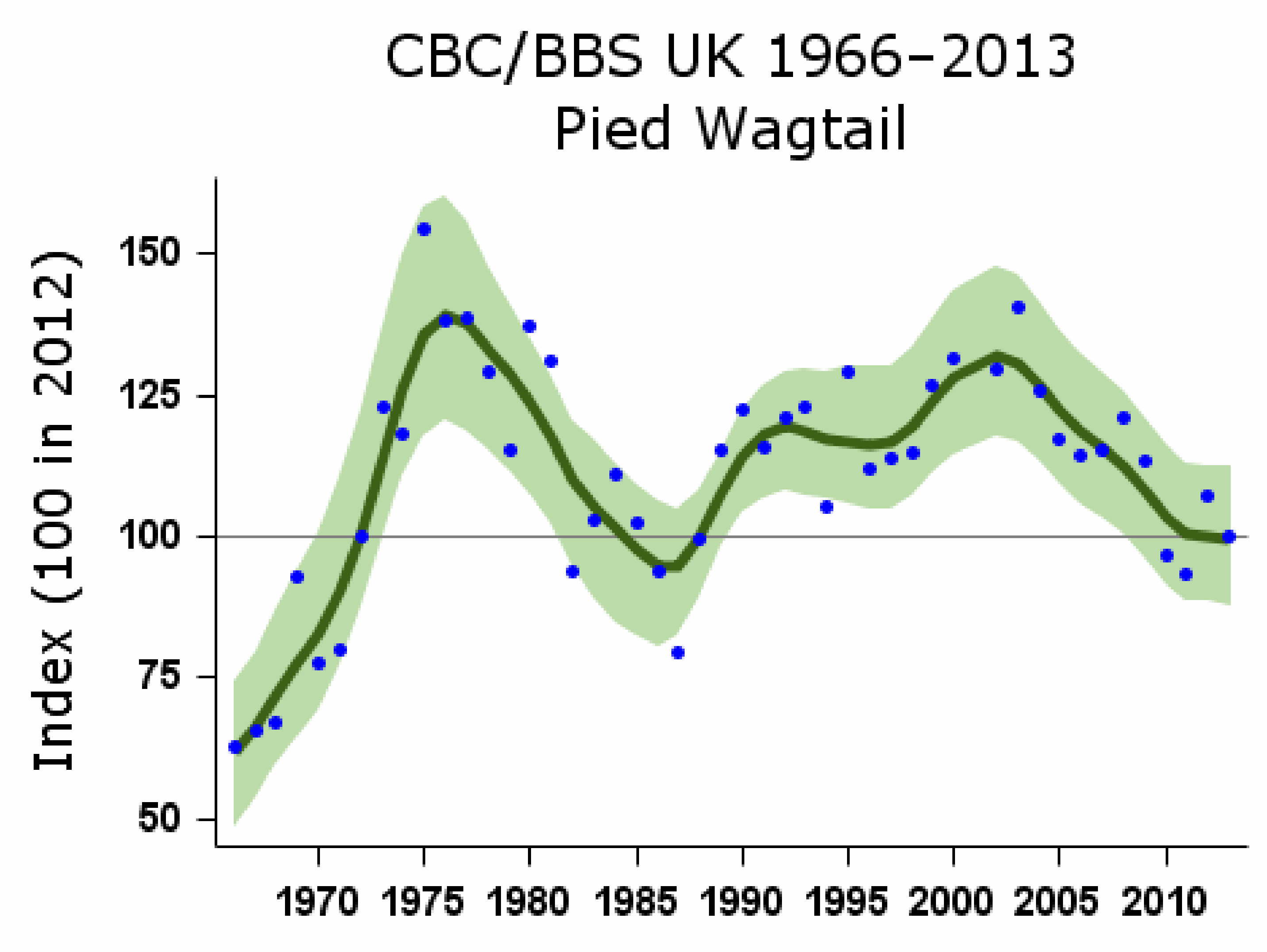
Motacilla alba

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 world population of the distinctive dark-backed race yarrellii (Pied Wagtail), 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 shallow increase overall since 1967. Since 1974, however, the results of monitoring have been 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, suggesting a strong 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 (White Wagtail), has shown little change since 1980 (PECBMS 2014a).



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

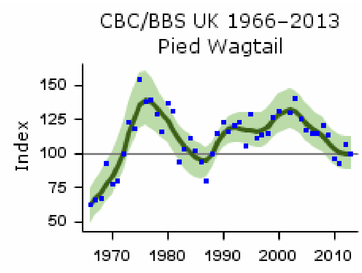
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	45	1967-2012	558	50	10	112		
	25	1987-2012	934	5	-14	36		
	10	2002-2012	1415	-24	-30	-17		

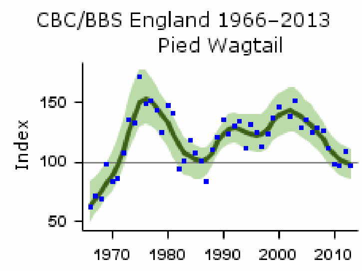
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	5	2007-2012	1509	-14	-20	-6		
CBC/BBS England	45	1967-2012	430	43	0	107		
	25	1987-2012	715	-2	-21	30		
	10	2002-2012	1084	-30	-34	-26	>25	
	5	2007-2012	1162	-20	-23	-17		
WBS/WBBS waterways	37	1975-2012	113	-65	-73	-55	>50	
	25	1987-2012	135	-34	-47	-13	>25	
	10	2002-2012	192	-23	-33	-11		
	5	2007-2012	166	-5	-16	7		
BBS UK	17	1995-2012	1274	-11	-18	-4		
	10	2002-2012	1415	-23	-29	-16		
	5	2007-2012	1509	-13	-19	-5		
BBS England	17	1995-2012	973	-17	-23	-11		
	10	2002-2012	1084	-30	-34	-26	>25	
	5	2007-2012	1162	-20	-24	-16		
BBS Scotland	17	1995-2012	138	-12	-26	6		
	10	2002-2012	145	-20	-35	-3		
	5	2007-2012	163	-5	-22	13		
BBS Wales	17	1995-2012	115	0	-19	23		
	10	2002-2012	128	-12	-25	5		
	5	2007-2012	124	-16	-26	-5		
BBS N.Ireland	17	1995-2012	44	31				
	10	2002-2012	54	2				
	5	2007-2012	57	-6				

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

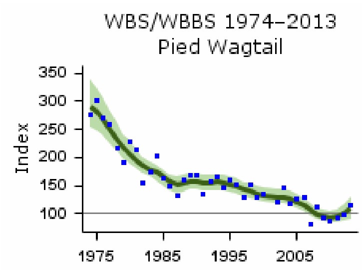
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



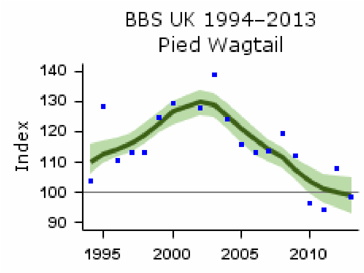
CBC/BBS UK graph



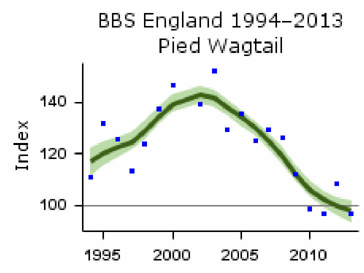
CBC/BBS England graph



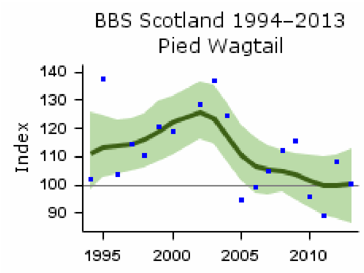
WBS/WBBS waterways graph



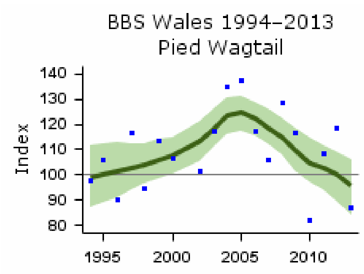
BBS UK graph



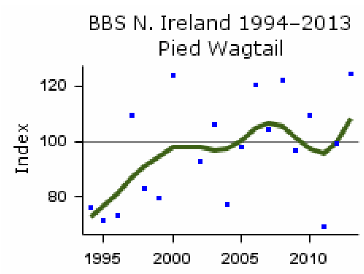
BBS England graph



BBS Scotland graph

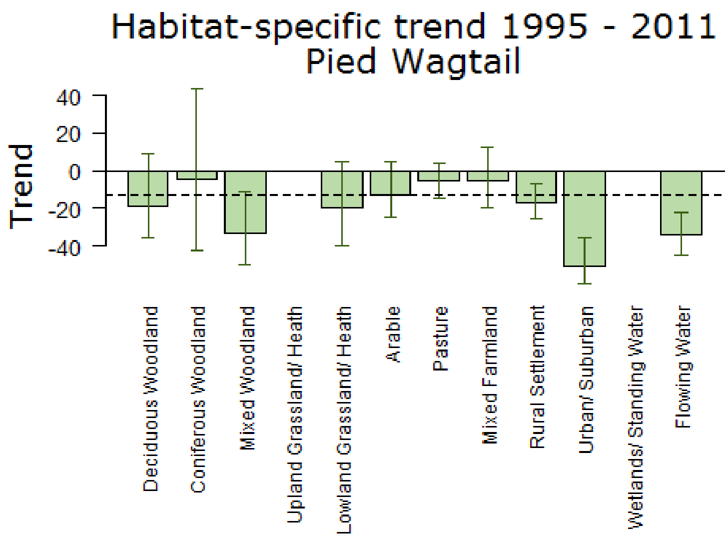


BBS Wales graph



BBS N.Ireland graph

Population trends by habitat



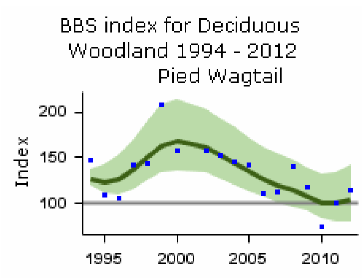
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

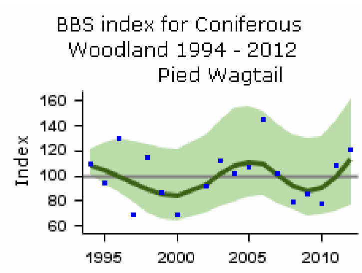
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	113	-19	-36	9
Coniferous Woodland	16	1995-2011	30	-4	-42	43
Mixed Woodland	16	1995-2011	55	-33	-50	-11
Lowland Grassland/ Heath	16	1995-2011	45	-20	-40	5
Arable	16	1995-2011	183	-12	-24	5
Pasture	16	1995-2011	504	-5	-14	4
Mixed Farmland	16	1995-2011	197	-5	-20	12
Rural Settlement	16	1995-2011	328	-17	-26	-7
Urban/ Suburban	16	1995-2011	117	-51	-60	-35
Flowing Water	16	1995-2011	133	-34	-45	-22

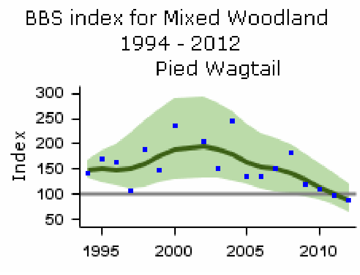
Further information on habitat-specific trends, please follow link here.



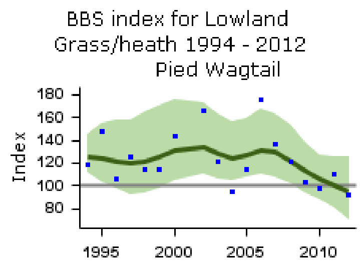
Habitat graph



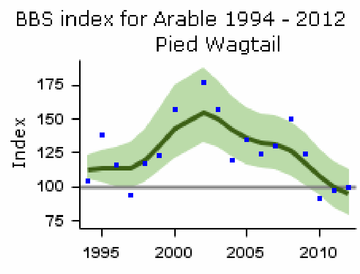
Habitat graph



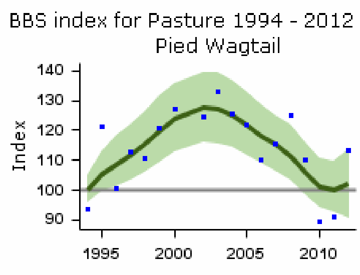
Habitat graph



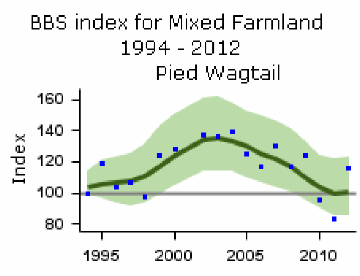
Habitat graph



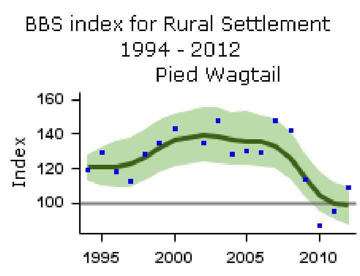
Habitat graph



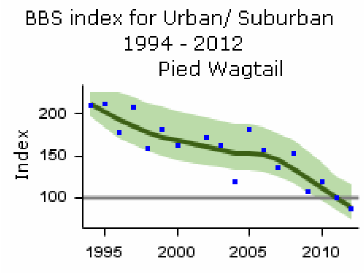
Habitat graph



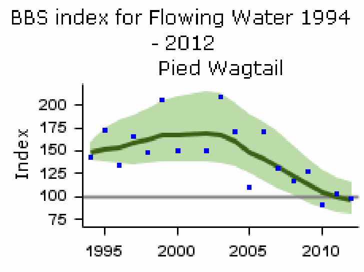
Habitat graph



Habitat graph

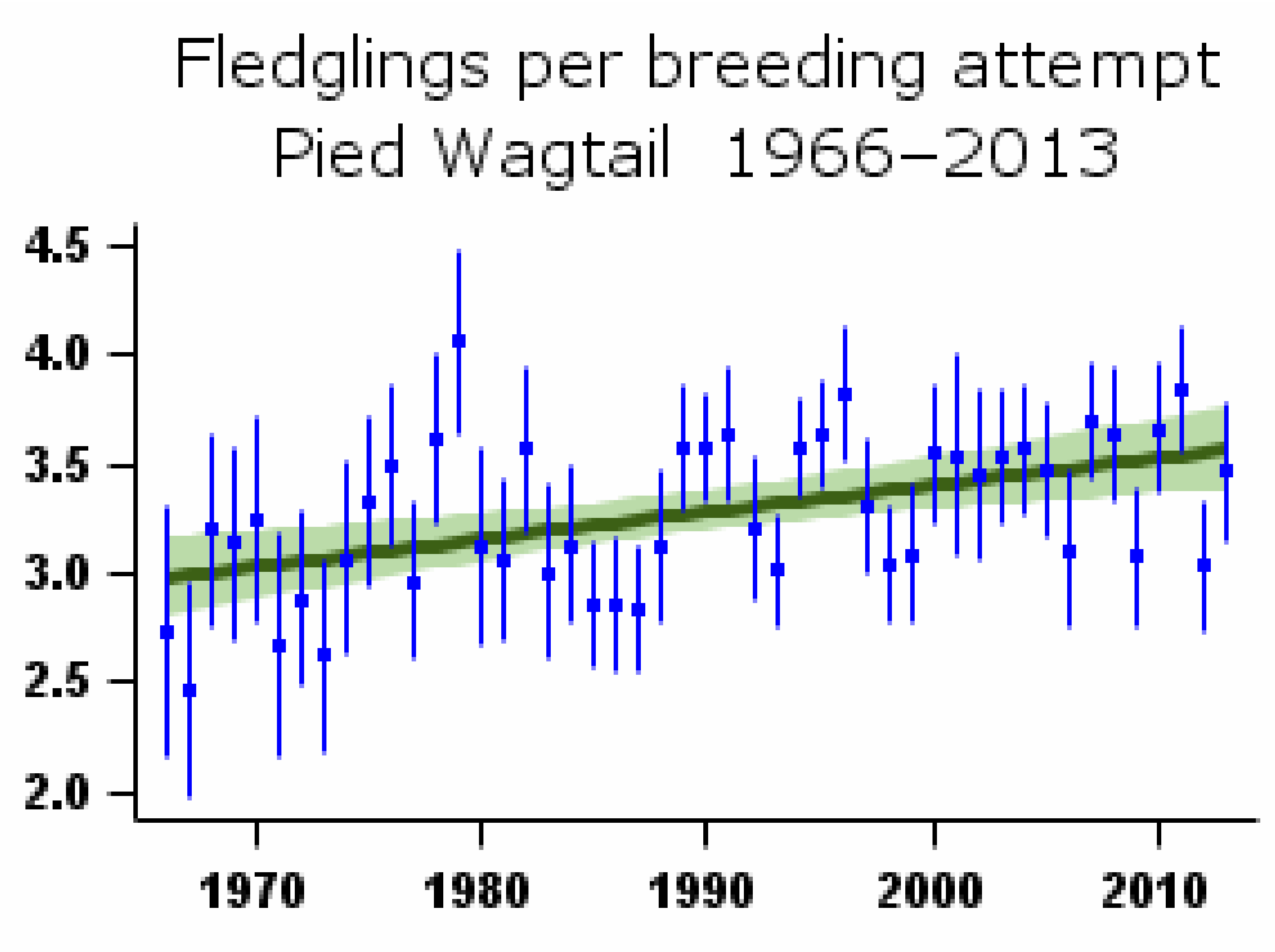


Habitat graph

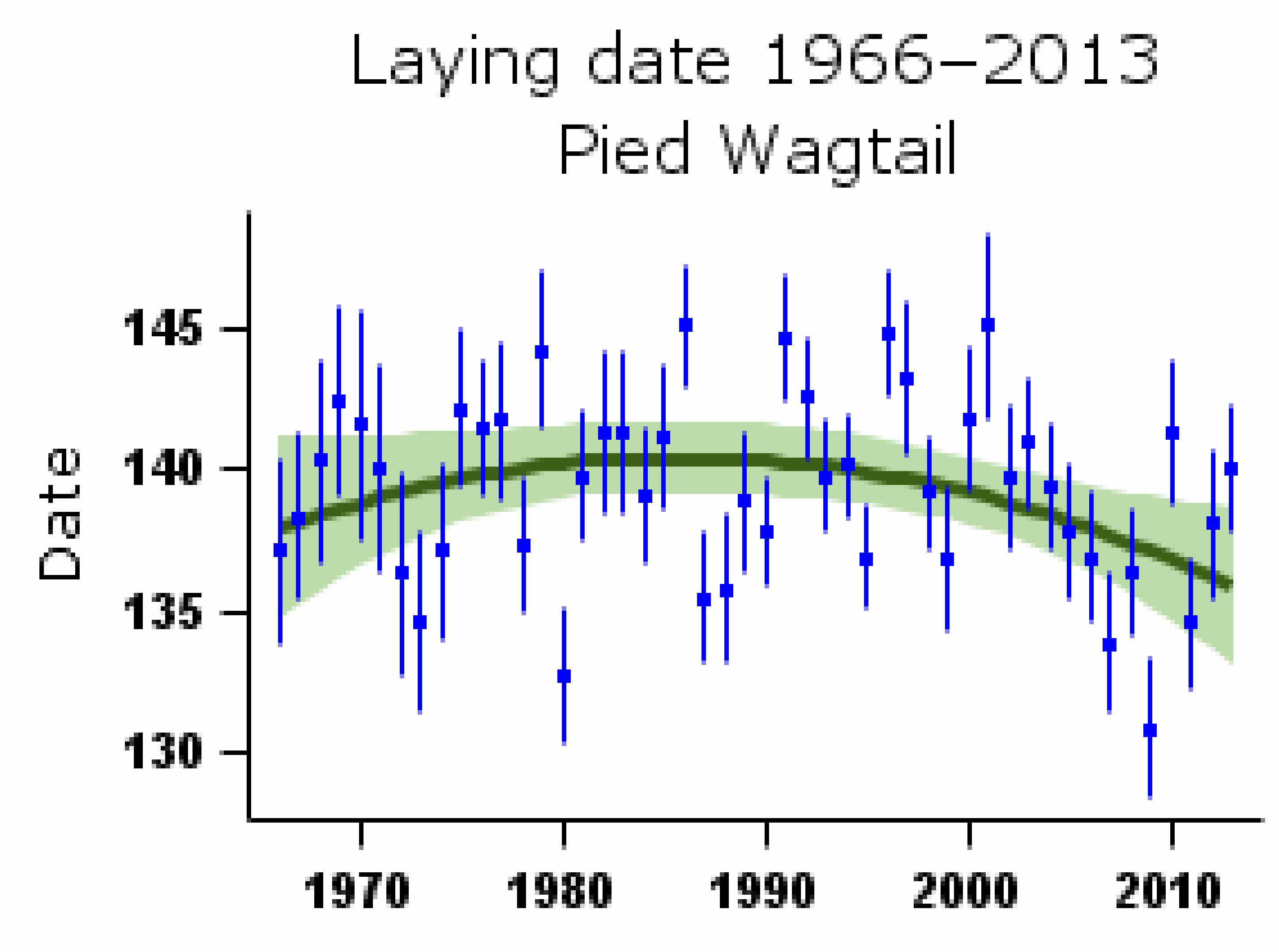


Habitat graph

Demographic trends



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

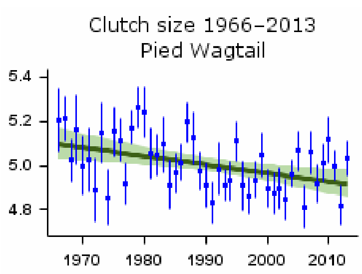


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

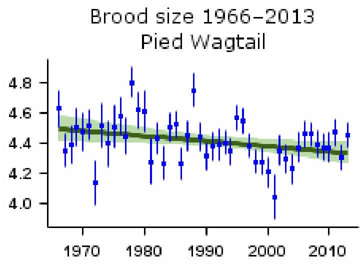
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	88	Linear increase	3.01 fledglings	3.55 fledglings	18.2%		
Clutch size	44	1968-2012	66	Linear decline	5.09 eggs	4.92 eggs	-3.3%		
Brood size	44	1968-2012	136	Linear decline	4.50 chicks	4.35 chicks	-3.3%		
Nest failure rate at egg stage	44	1968-2012	89	Linear decline	1.80% nests/day	0.68% nests/day	-62.2%		
Nest failure rate at chick stage	44	1968-2012	98	None					
Laying date	44	1968-2012	89	Curvilinear	May 18	May 16	-2 days		

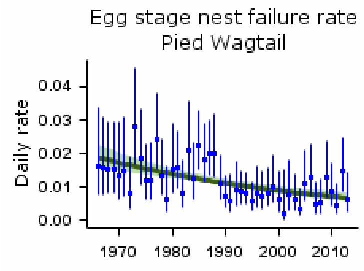
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



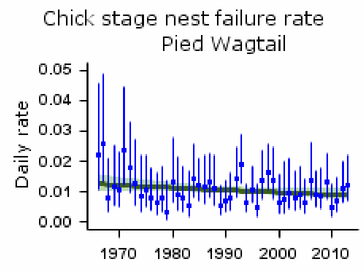
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



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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Tree Pipit

Anthus trivialis

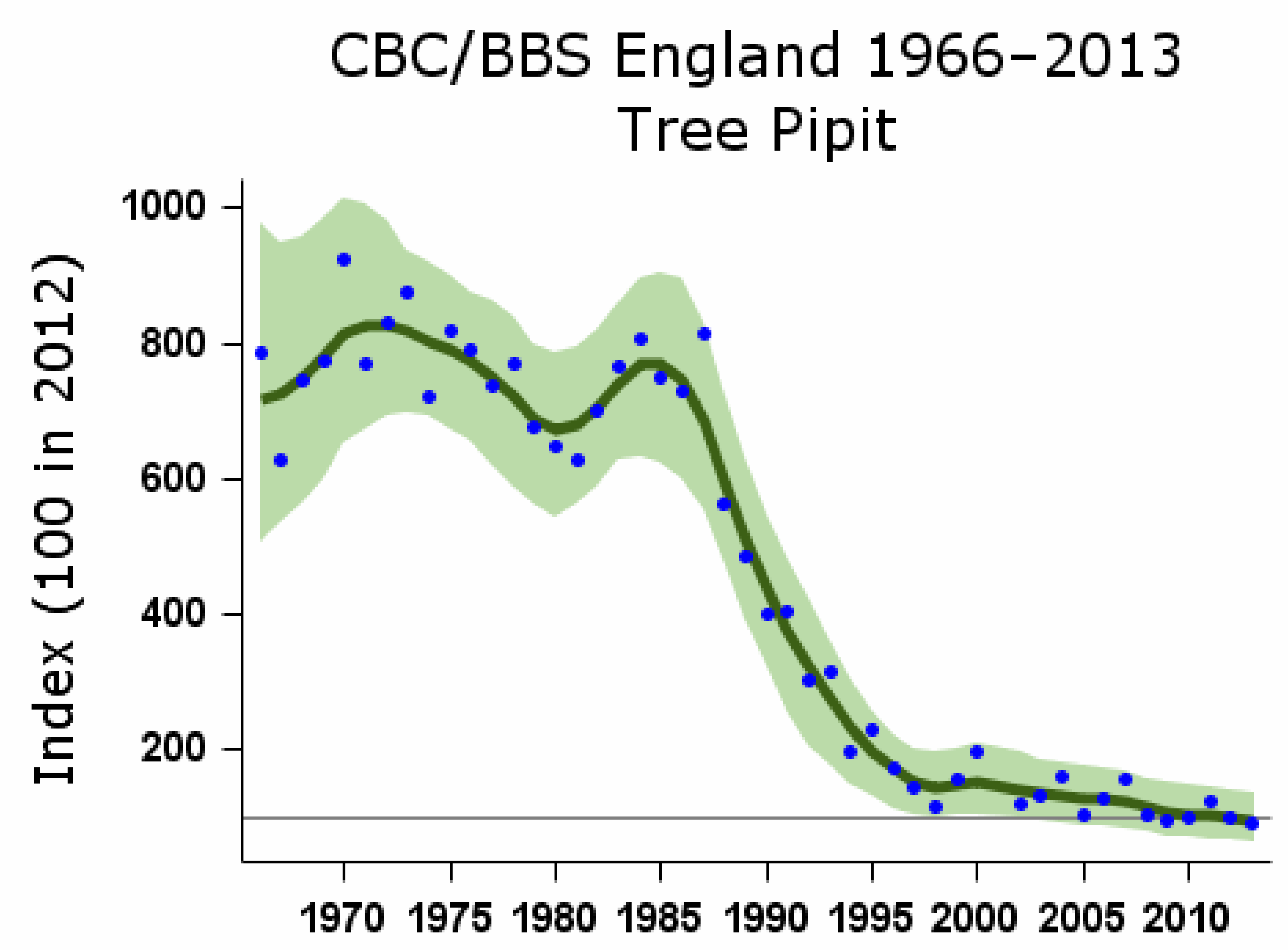
Key facts

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 first 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. Recent atlas data show further losses of range, especially in eastern England (Balmer et al. 2013). Brood size has increased since 1966 but nest losses have also increased and there has been a decrease in fledglings per breeding attempt. Laying dates have shifted earlier by nearly a week. Although the species has no European conservation listing as yet, numbers have shown a widespread moderate decline across Europe since 1980 (PECBMS 2014a), 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 in 2009 to red, on the strength of its UK population decline (Eaton et al. 2009). It is among a suite of species that winter in the humid zone of West Africa and correspondingly are showing the strongest population declines among our migrant species (Ockendon et al. 2012, 2014).



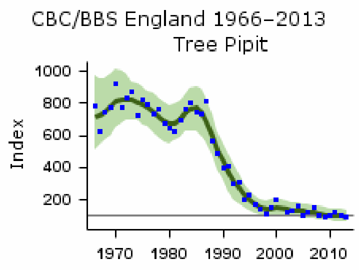
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

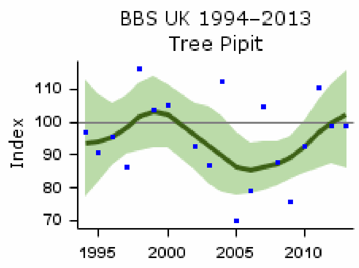
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	45	1967-2012	50	-86	-93	-72	>50	
	25	1987-2012	62	-85	-92	-78	>50	Small CBC sample
	10	2002-2012	78	-28	-43	-9	>25	
	5	2007-2012	88	-17	-29	-5		
BBS UK	17	1995-2012	140	6	-20	33		
	10	2002-2012	145	4	-16	30		
	5	2007-2012	168	16	-2	33		
BBS England	17	1995-2012	75	-48	-63	-26	>25	
	10	2002-2012	78	-28	-44	-12	>25	
	5	2007-2012	88	-17	-30	-4		
BBS Scotland	17	1995-2012	32	86	29	153		
	10	2002-2012	35	23	-10	81		
	5	2007-2012	47	32	0	70		
BBS Wales	17	1995-2012	32	1	-30	43		
	10	2002-2012	33	6	-28	49		
	5	2007-2012	33	17	-9	46		

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

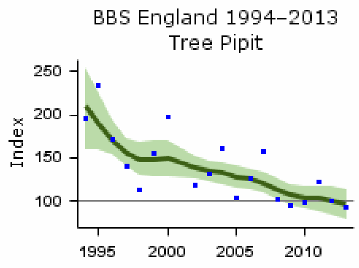
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



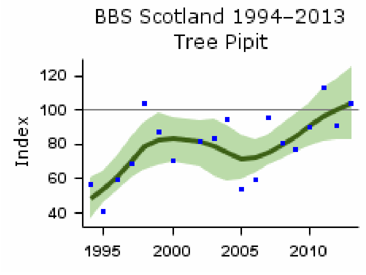
CBC/BBS England graph



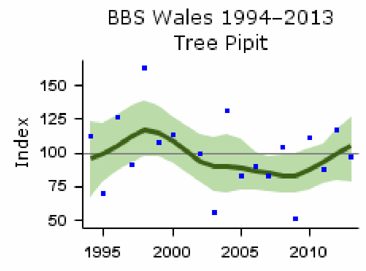
BBS UK graph



BBS England graph

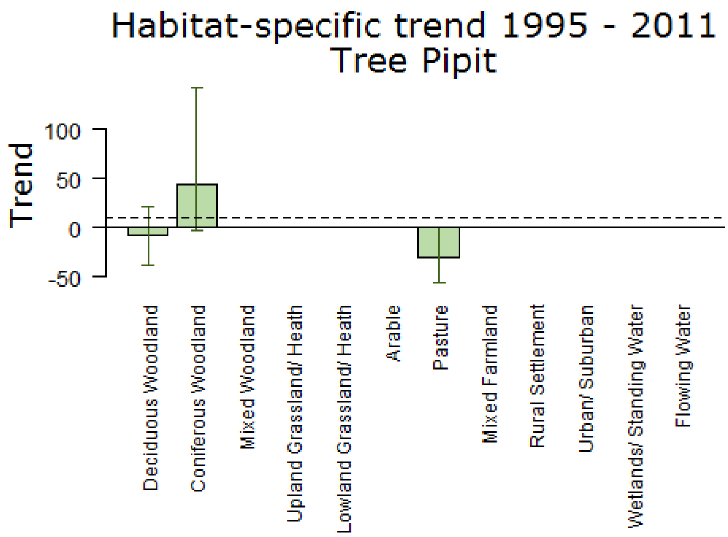


BBS Scotland graph



BBS Wales graph

Population trends by habitat



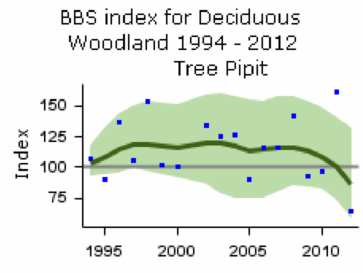
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

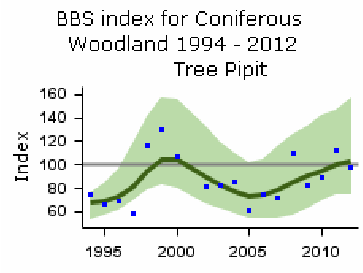
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	30	-8	-37	21
Coniferous Woodland	16	1995-2011	37	44	-2	142
Pasture	16	1995-2011	36	-31	-55	0

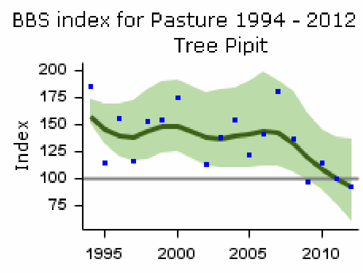
Further information on habitat-specific trends, please follow link here.



Habitat graph

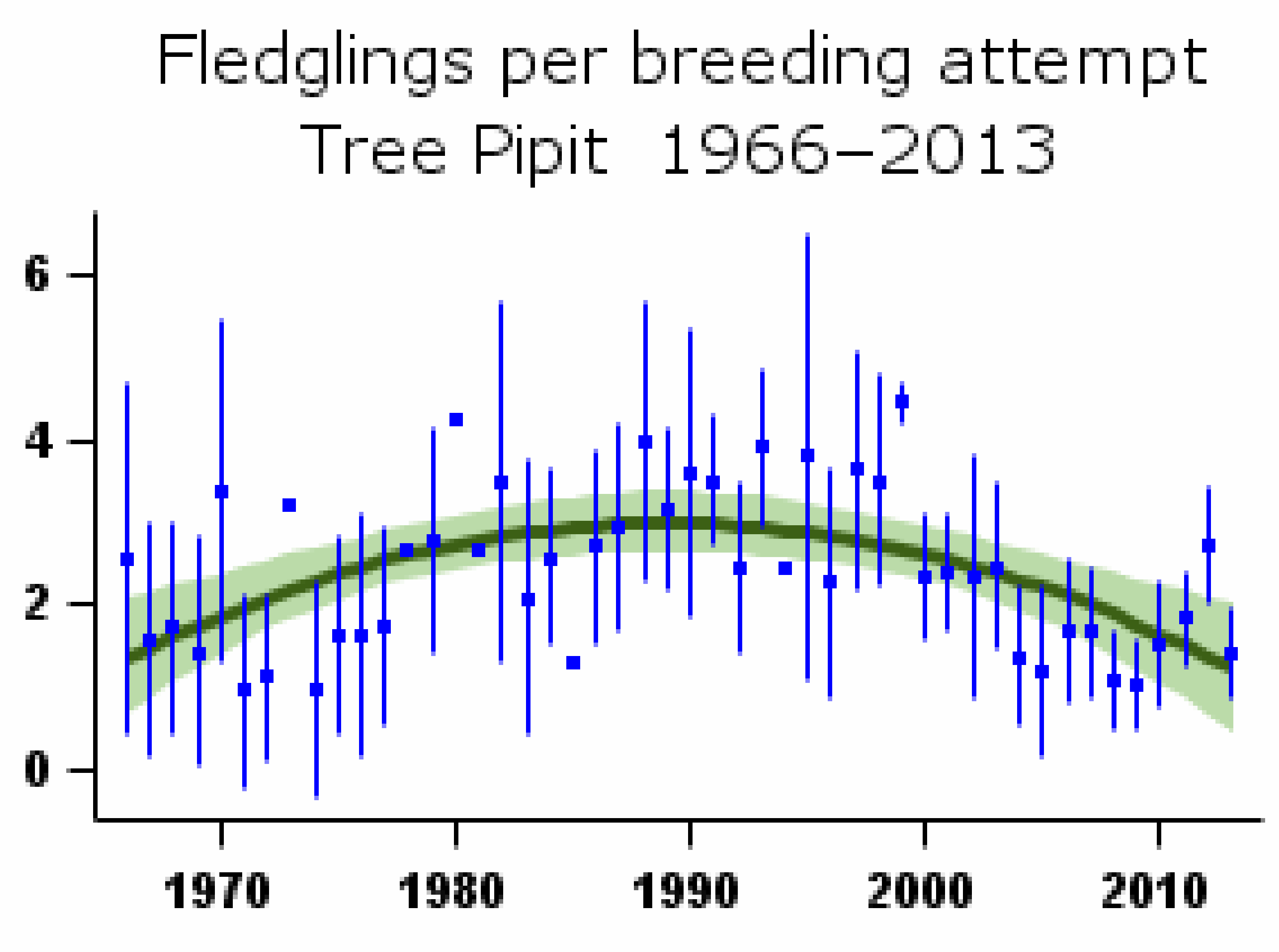


Habitat graph

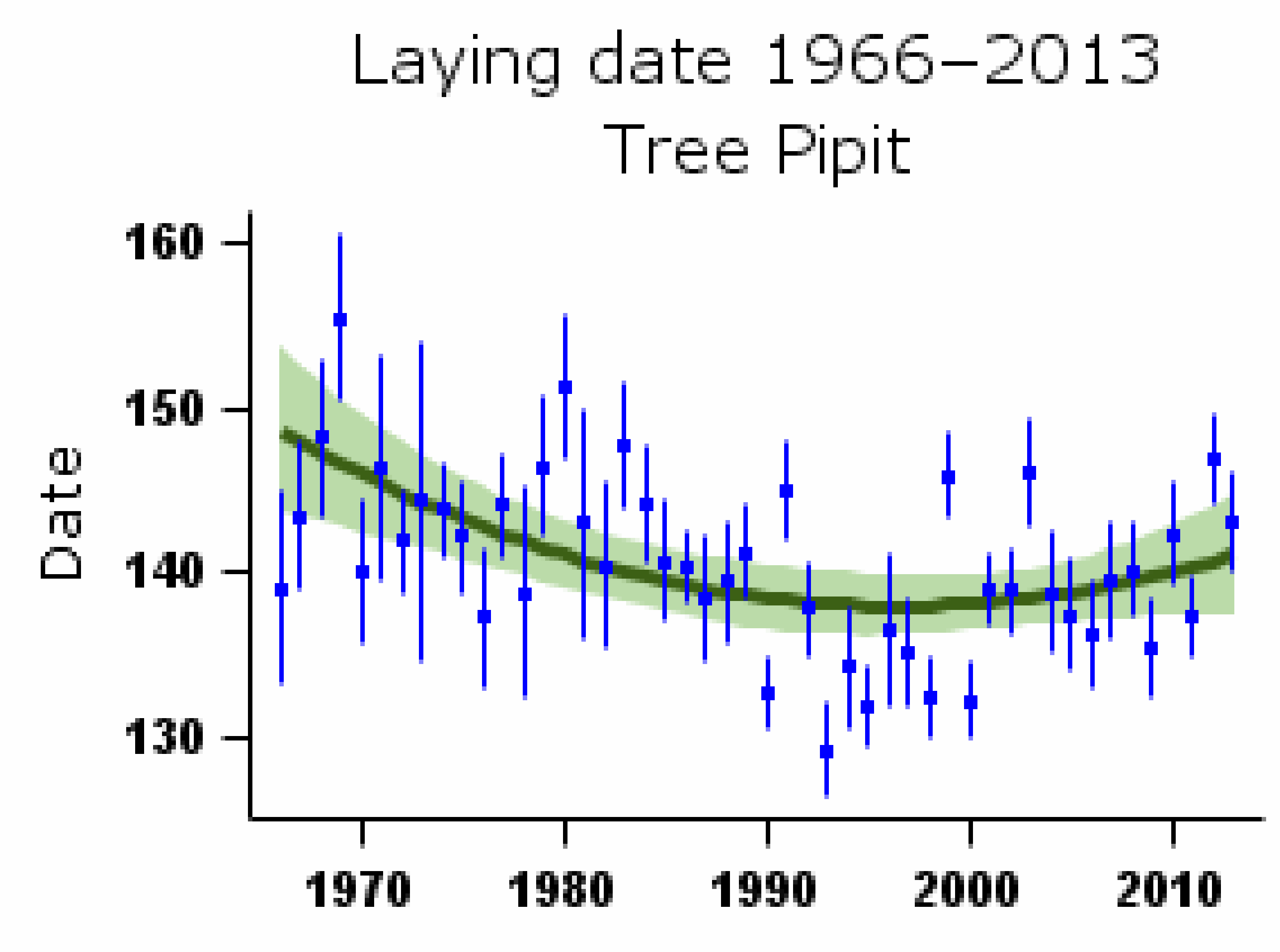


Habitat graph

Demographic trends



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

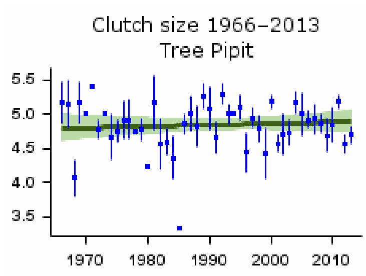


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

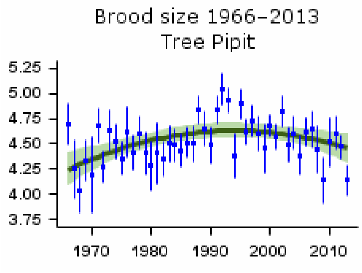
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	14	Curvilinear	1.62 fledglings	1.37 fledglings	-15.5%		
Clutch size	44	1968-2012	11	None					Small sample
Brood size	44	1968-2012	30	Curvilinear	4.30 chicks	4.47 chicks	4.0%		Small sample
Nest failure rate at egg stage	44	1968-2012	14	Curvilinear	4.63% nests/day	4.23% nests/day	-8.6%		Small sample
Nest failure rate at chick stage	44	1968-2012	22	None					Small sample
Laying date	44	1968-2012	21	Curvilinear	May 27	May 21	-6 days		Small sample

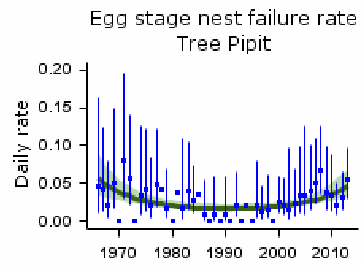
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



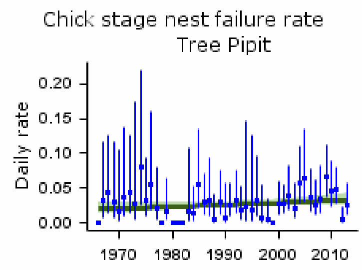
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



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

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 southeast 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 contributing 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 the wintering grounds is lacking, these cannot be ruled out as causes of population decline.

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

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Meadow Pipit

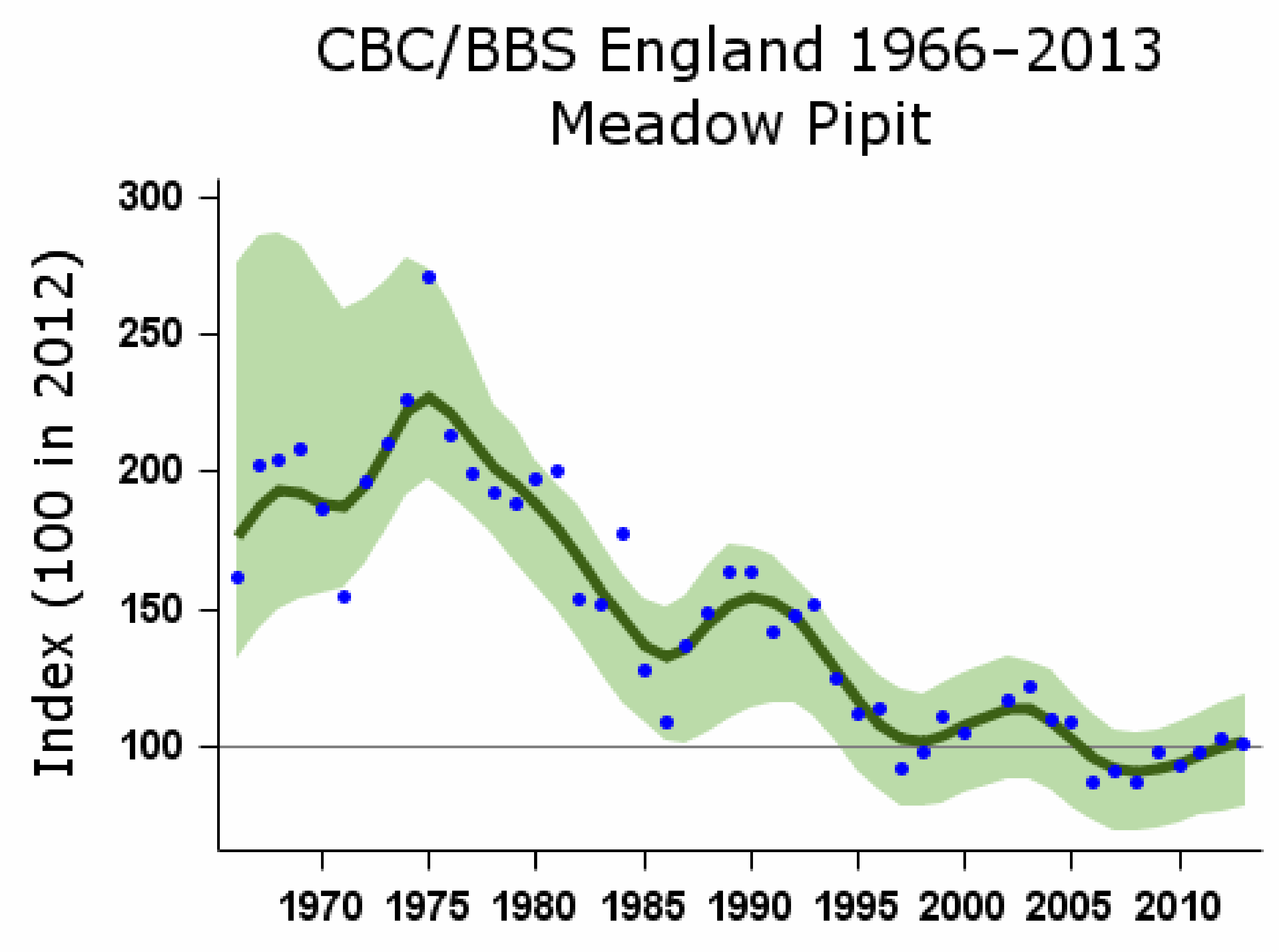
Anthus pratensis

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. 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 that, in England at least, confirms the picture presented by CBC. The species has accordingly been moved from the green to the amber list. The BBS 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 chick stage have declined markedly, which may reflect the loss of birds from suboptimal habitat, and the number of fledglings per breeding attempt has increased. A widespread moderate decline is evident across Europe since 1980 (PECBMS 2014a, Lehikoinen et al. 2014).



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

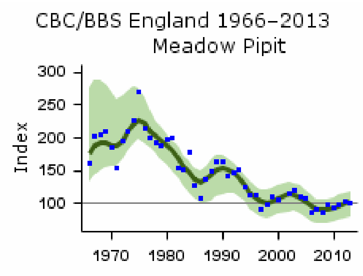
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	45	1967-2012	199	-47	-74	-18	>25	
	25	1987-2012	328	-27	-43	-4	>25	
	10	2002-2012	516	-13	-21	-5		
	5	2007-2012	592	8	3	13		

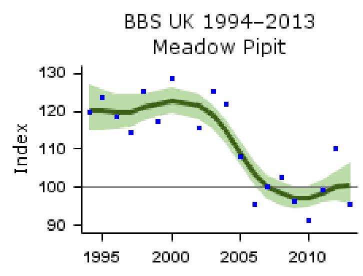
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	17	1995-2012	812	-17	-23	-9		
	10	2002-2012	900	-18	-22	-12		
	5	2007-2012	997	0	-5	6		
BBS England	17	1995-2012	446	-12	-21	-3		
	10	2002-2012	516	-12	-20	-4		
	5	2007-2012	592	8	2	13		
BBS Scotland	17	1995-2012	211	-25	-34	-15	>25	
	10	2002-2012	214	-20	-28	-11		
	5	2007-2012	236	-4	-13	7		
BBS Wales	17	1995-2012	87	-6	-18	7		
	10	2002-2012	94	-20	-29	-8		
	5	2007-2012	92	-2	-11	7		
BBS N.Ireland	17	1995-2012	64	-29	-44	-9	>25	
	10	2002-2012	72	-51	-58	-46	>50	
	5	2007-2012	71	-44	-52	-36	>25	

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

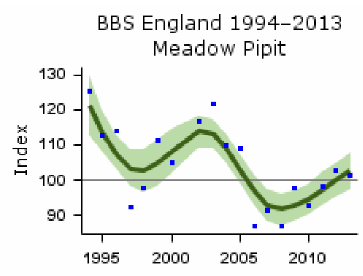
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



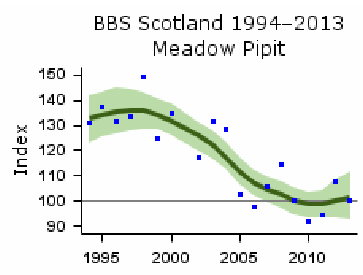
CBC/BBS England graph



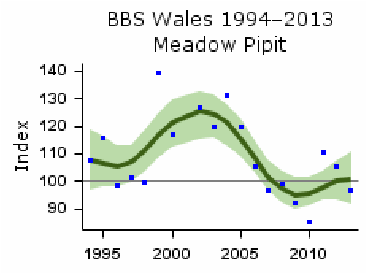
BBS UK graph



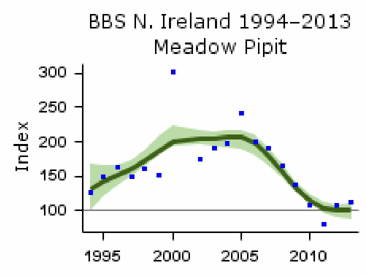
BBS England graph



BBS Scotland graph

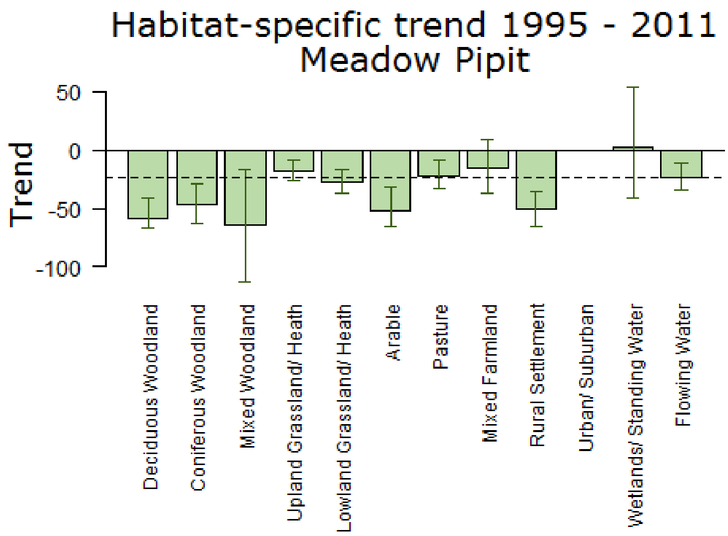


BBS Wales graph



BBS N.Ireland graph

Population trends by habitat



Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

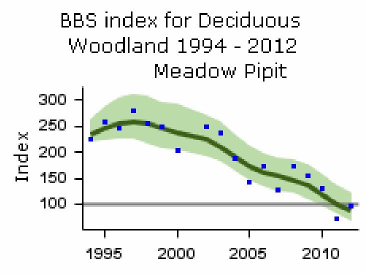
Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

More on habitat trends

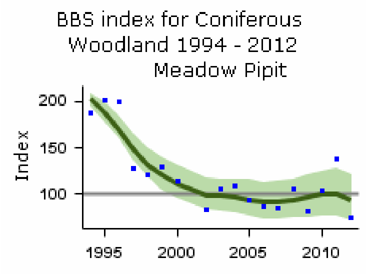
Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	66	-59	-67	-42
Coniferous Woodland	16	1995-2011	76	-47	-62	-29
Mixed Woodland	16	1995-2011	32	-65	-113	-17
Upland Grassland/ Heath	16	1995-2011	134	-18	-26	-9
Lowland Grassland/ Heath	16	1995-2011	158	-27	-37	-16
Arable	16	1995-2011	73	-52	-66	-32
Pasture	16	1995-2011	299	-23	-34	-8
Mixed Farmland	16	1995-2011	73	-16	-37	9

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Rural Settlement	16	1995-2011	73	-51	-66	-36
Wetlands/ Standing Water	16	1995-2011	32	3	-41	54
Flowing Water	16	1995-2011	132	-23	-34	-11

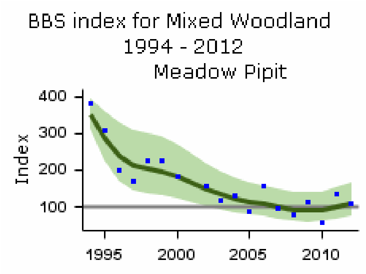
Further information on habitat-specific trends, please follow link here.



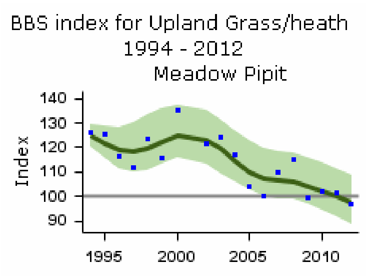
Habitat graph



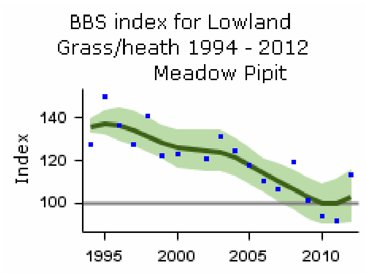
Habitat graph



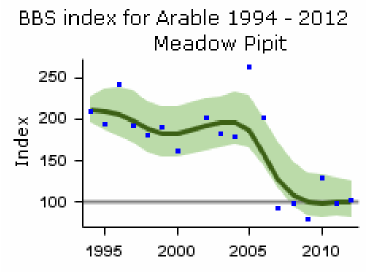
Habitat graph



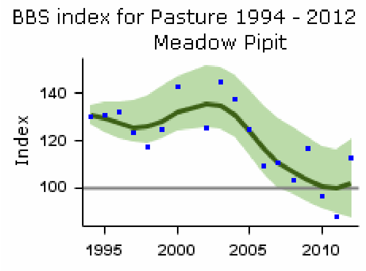
Habitat graph



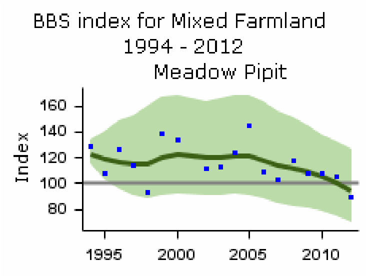
Habitat graph



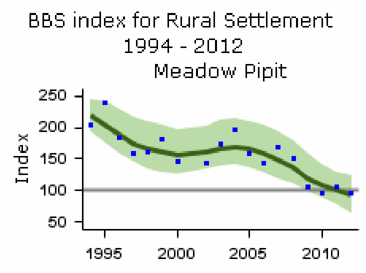
Habitat graph



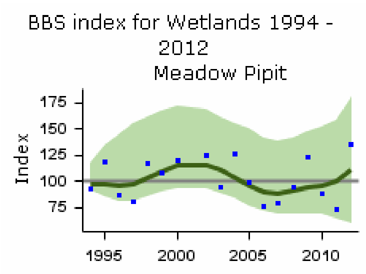
Habitat graph



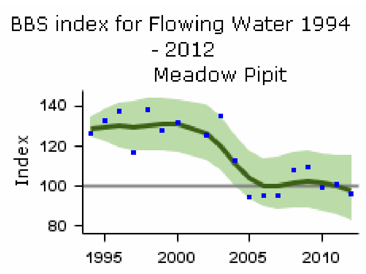
Habitat graph



Habitat graph

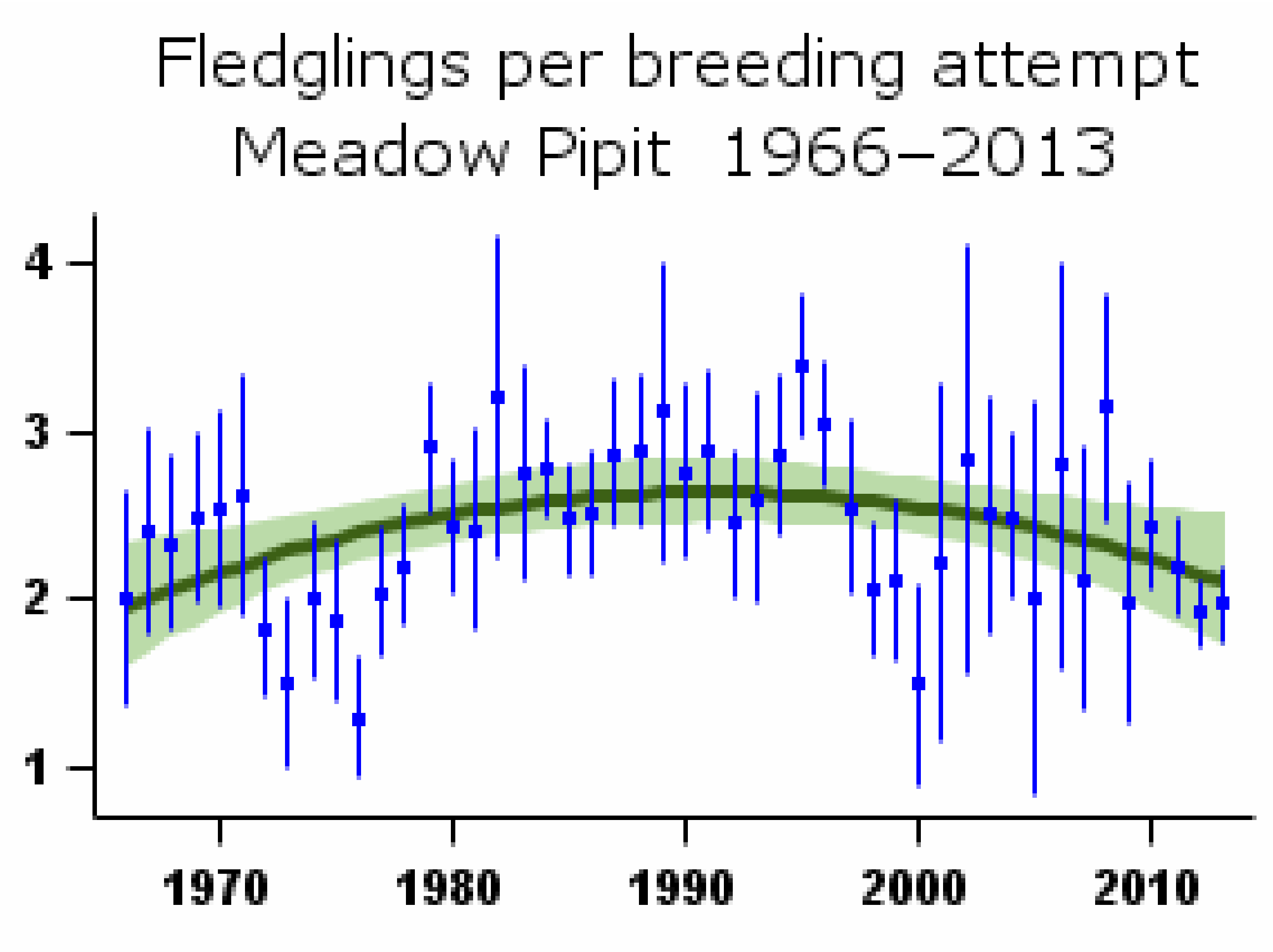


Habitat graph

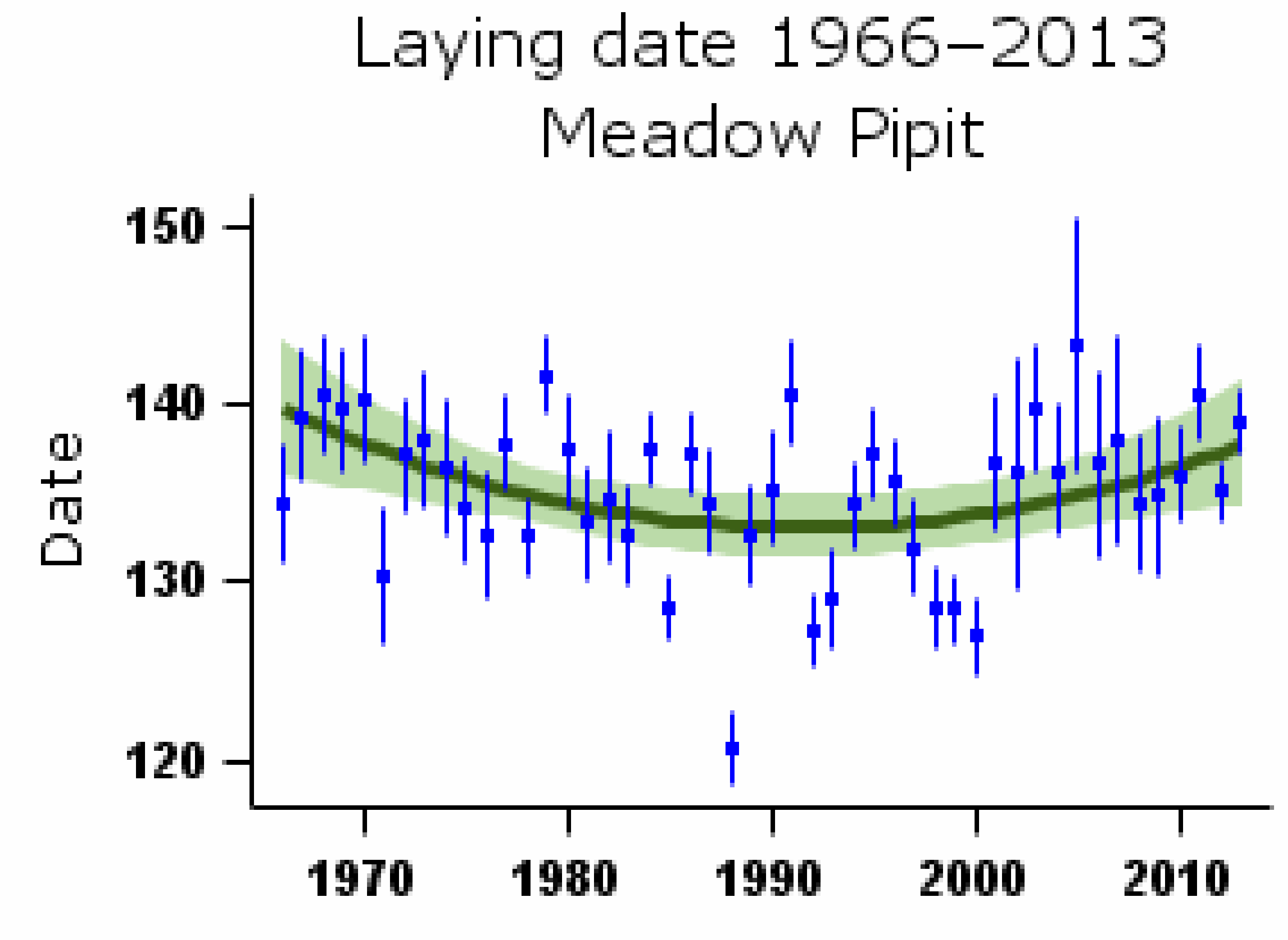


Habitat graph

Demographic trends



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

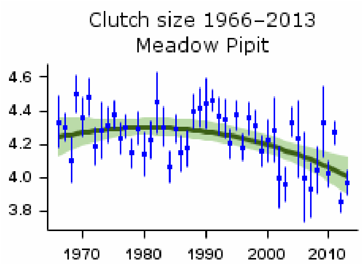


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

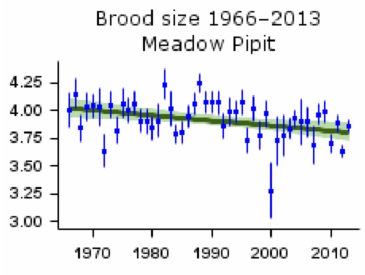
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	48	Curvilinear	2.07 fledglings	2.15 fledglings	4.3%		
Clutch size	44	1968-2012	39	Curvilinear	4.26 eggs	4.02 eggs	-5.5%		
Brood size	44	1968-2012	77	Linear decline	4.01 chicks	3.81 chicks	-4.9%		
Nest failure rate at egg stage	44	1968-2012	49	Curvilinear	2.06% nests/day	2.33% nests/day	13.1%		
Nest failure rate at chick stage	44	1968-2012	68	Curvilinear	3.13% nests/day	2.00% nests/day	-36.1%		
Laying date	44	1968-2012	42	Curvilinear	May 19	May 17	-2 days		

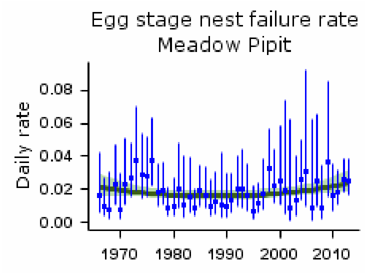
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



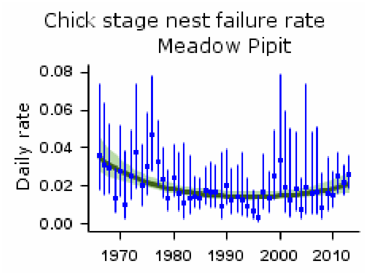
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



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

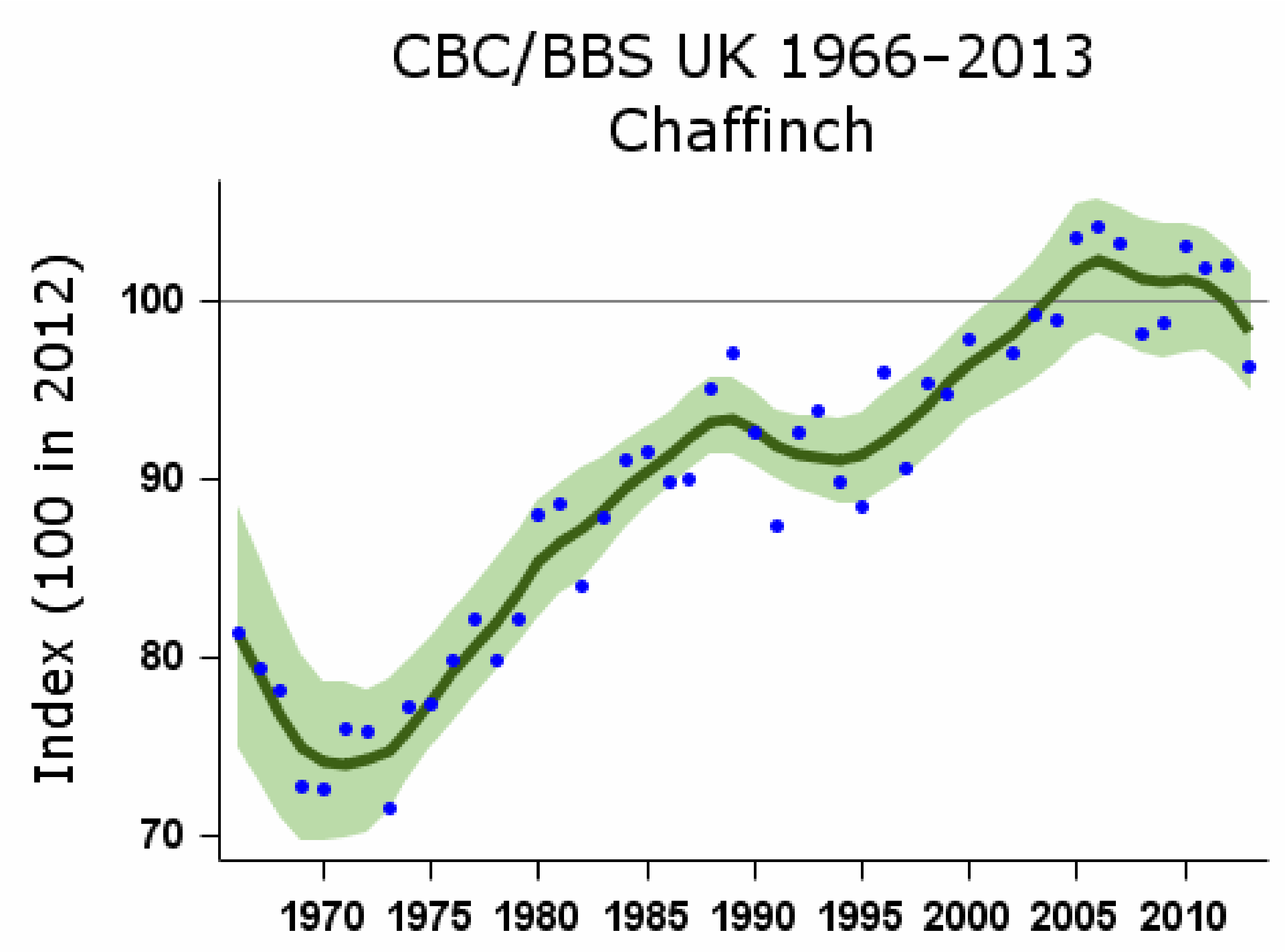
Fringilla coelebs

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 either cancelled out or reversed and changes in adult survival seem to be a greater contributor to annual population change (Robinson et al. 2014). The BBS Robinson et al. 2010). The trend towards earlier laying is at least 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 2014a).



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

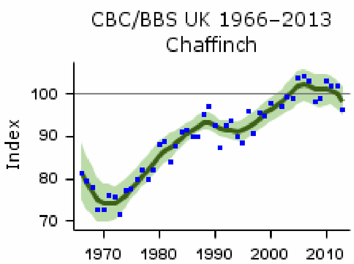
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	45	1967-2012	1139	27	11	42		
	25	1987-2012	1876	8	2	13		

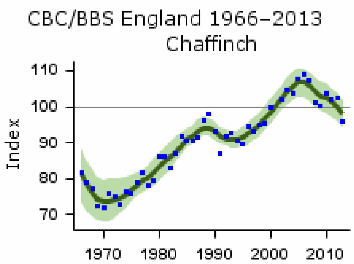
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	45	1967-2012	903	27	11	46		
	25	1987-2012	1477	7	1	14		
	10	2002-2012	2229	-2	-5	0		
	5	2007-2012	2518	-6	-7	-4		
CES adults	28	1984-2012	78	-5	-48	53		
	25	1987-2012	83	-15	-43	15		
	10	2002-2012	84	-22	-35	-12		
	5	2007-2012	78	-25	-34	-17	>25	
CES juveniles	28	1984-2012	61	16	-31	99		
	25	1987-2012	65	47	-12	176		
	10	2002-2012	67	19	-13	51		
	5	2007-2012	60	7	-21	37		
BBS UK	17	1995-2012	2508	11	8	15		
	10	2002-2012	2839	3	0	5		
	5	2007-2012	3177	-1	-3	1		
BBS England	17	1995-2012	1962	9	6	13		
	10	2002-2012	2229	-2	-5	0		
	5	2007-2012	2518	-6	-7	-4		
BBS Scotland	17	1995-2012	242	13	5	23		
	10	2002-2012	264	12	5	22		
	5	2007-2012	307	3	-3	9		
BBS Wales	17	1995-2012	199	-8	-21	5		
	10	2002-2012	224	5	-4	13		
	5	2007-2012	222	6	-2	14		
BBS N.Ireland	17	1995-2012	91	51	18	67		
	10	2002-2012	106	-2	-11	7		
	5	2007-2012	112	7	-1	15		

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

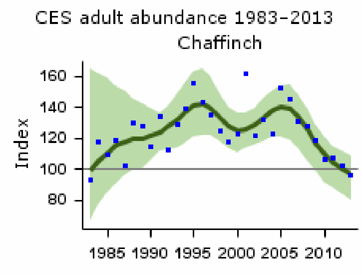
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



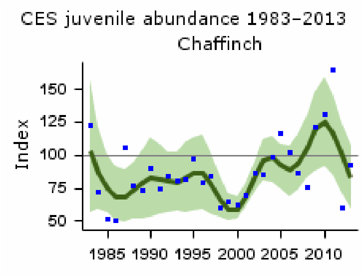
CBC/BBS UK graph



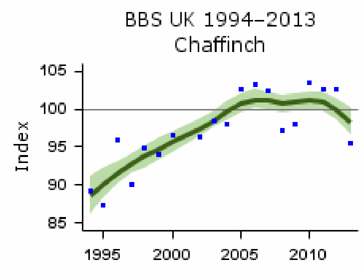
CBC/BBS England graph



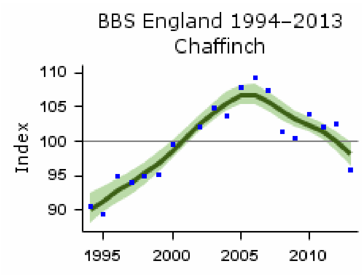
CES adults graph



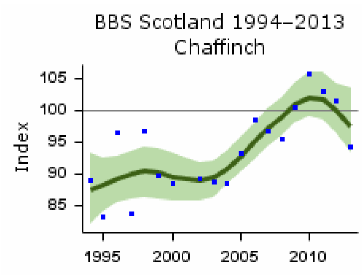
CES juveniles graph



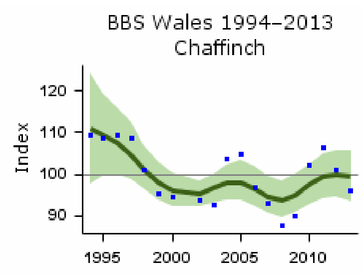
BBS UK graph



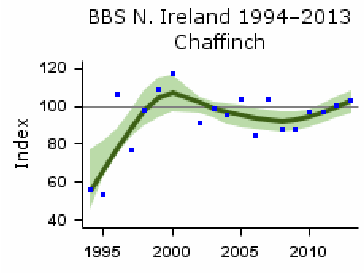
BBS England graph



BBS Scotland graph

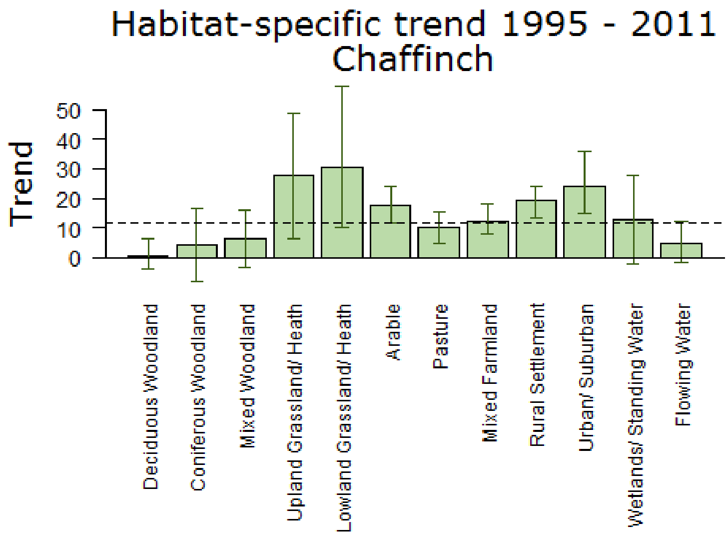


BBS Wales graph



BBS N.Ireland graph

Population trends by habitat



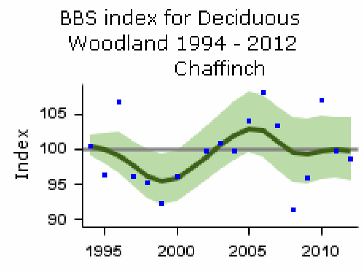
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

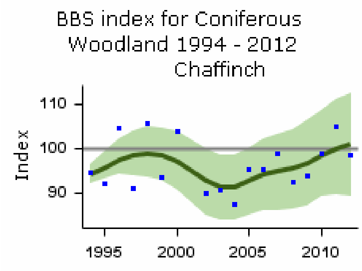
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	950	0	-4	6
Coniferous Woodland	16	1995-2011	289	4	-8	16
Mixed Woodland	16	1995-2011	532	6	-3	16
Upland Grassland/ Heath	16	1995-2011	64	28	6	49
Lowland Grassland/ Heath	16	1995-2011	218	31	10	58
Arable	16	1995-2011	868	17	12	24
Pasture	16	1995-2011	1445	10	5	15
Mixed Farmland	16	1995-2011	832	12	8	18
Rural Settlement	16	1995-2011	948	19	13	24
Urban/ Suburban	16	1995-2011	394	24	15	36
Wetlands/ Standing Water	16	1995-2011	108	13	-3	28
Flowing Water	16	1995-2011	582	5	-2	12

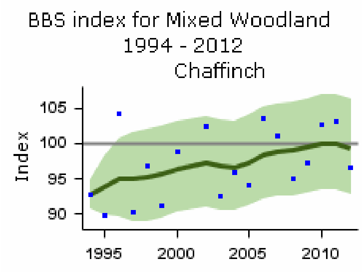
Further information on habitat-specific trends, please follow link here.



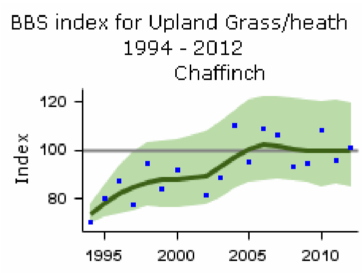
Habitat graph



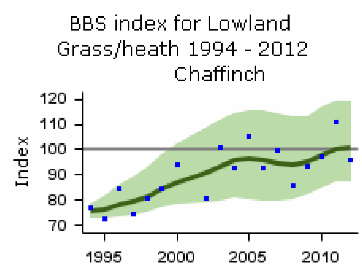
Habitat graph



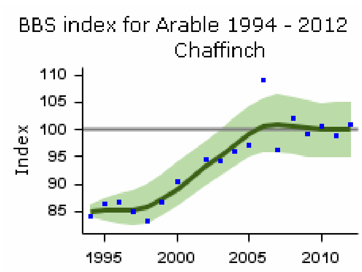
Habitat graph



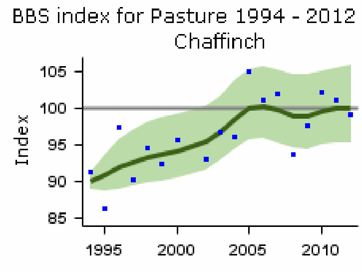
Habitat graph



Habitat graph



Habitat graph



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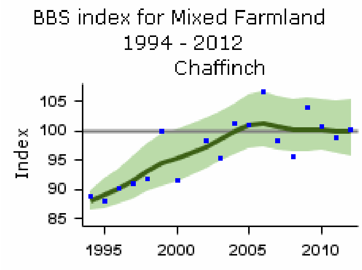

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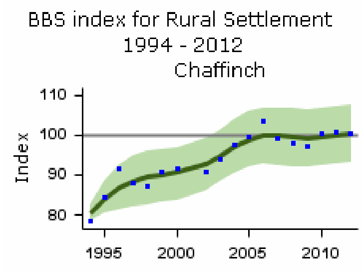
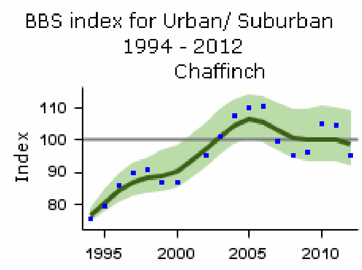
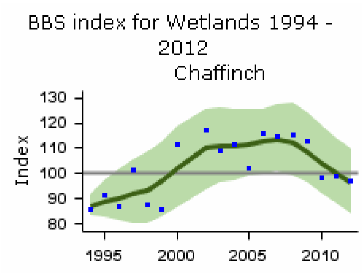


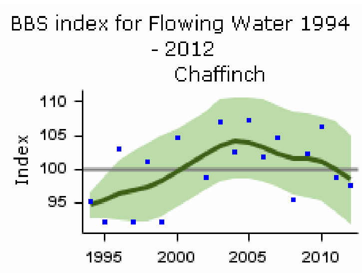
Habitat graph



Habitat graph

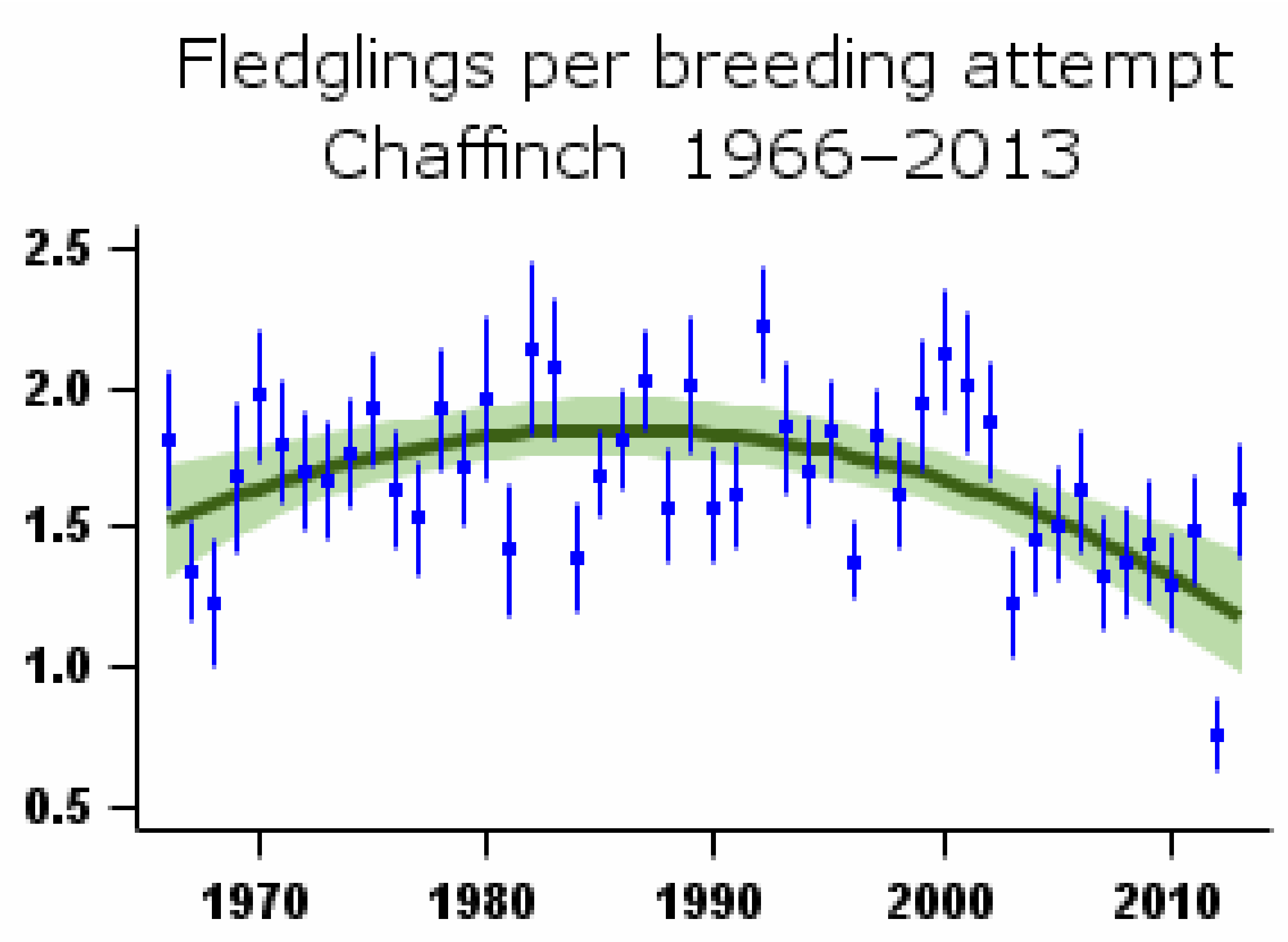


Habitat graph

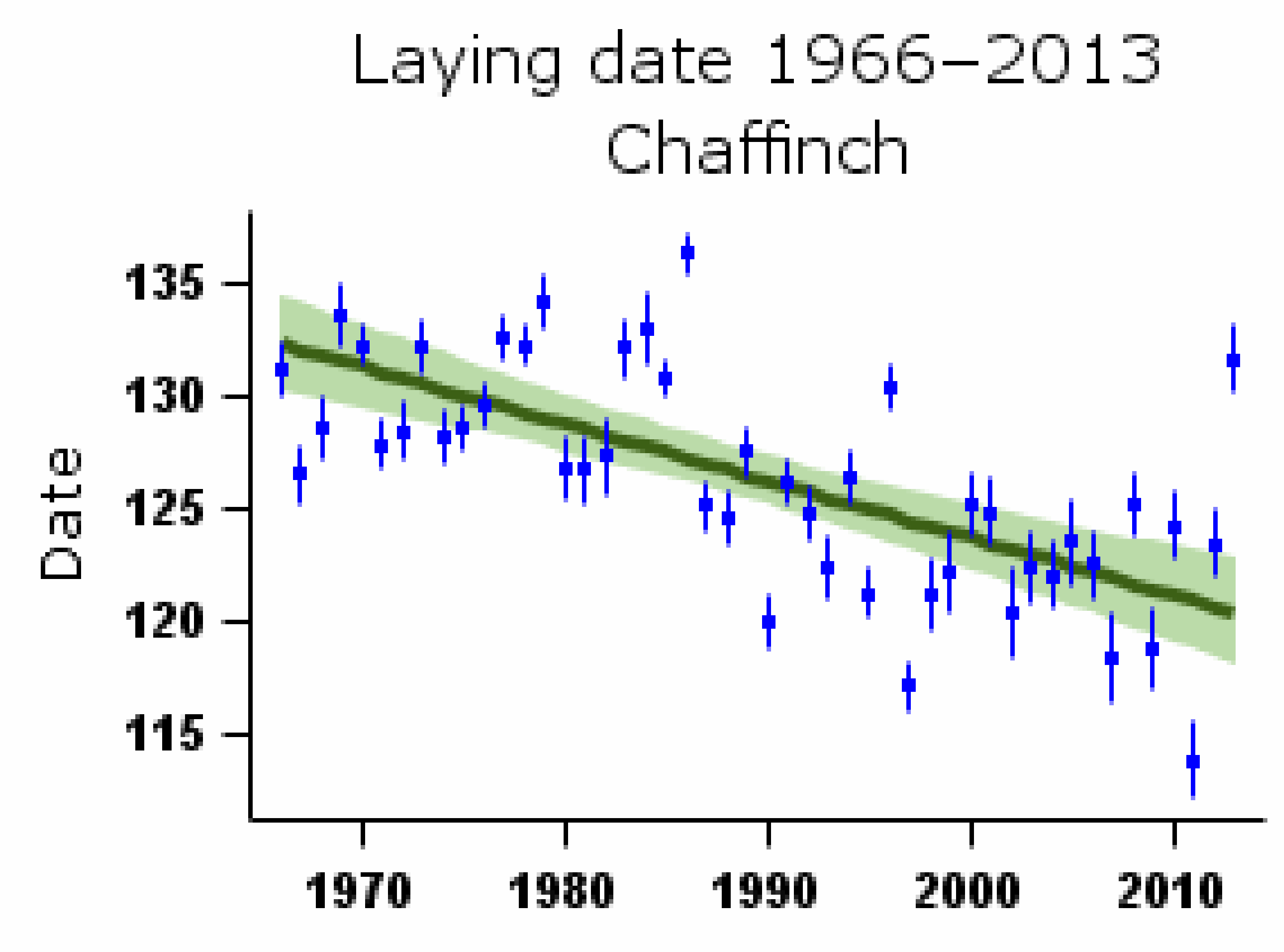


Habitat graph

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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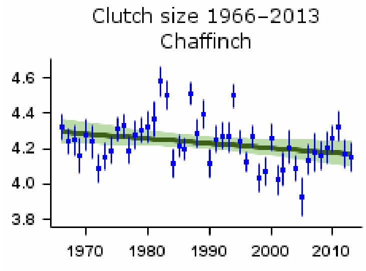
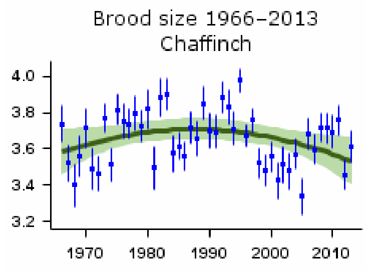
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	128	Curvilinear	1.58 fledglings	1.24 fledglings	-21.9%		
Clutch size	44	1968-2012	100	None					
Brood size	44	1968-2012	160	Curvilinear	3.60 chicks	3.54 chicks	-1.7%		
Nest failure rate at egg stage	44	1968-2012	190	Curvilinear	3.01% nests/day	4.43% nests/day	47.2%		
Nest failure rate at chick stage	44	1968-2012	128	Curvilinear	3.05% nests/day	3.57% nests/day	17.0%		
Laying date	44	1968-2012	121	Linear decline	May 12	May 1	-11 days		
Juvenile to Adult ratio (CES)	28	1984-2012	84	Smoothed trend	53 Index value	100 Index value	88%		
Juvenile to Adult ratio (CES)	25	1987-2012	90	Smoothed trend	89 Index value	100 Index value	13%		
Juvenile to Adult ratio (CES)	10	2002-2012	92	Smoothed trend	102 Index value	100 Index value	-2%		
Juvenile to Adult ratio (CES)	5	2007-2012	86	Smoothed trend	94 Index value	100 Index value	6%		

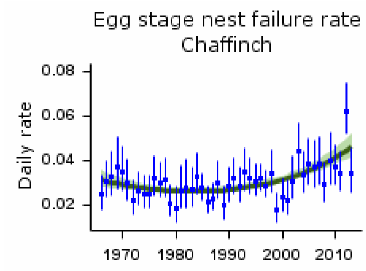
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



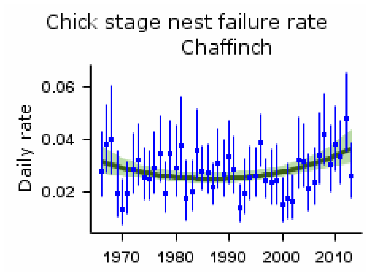
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



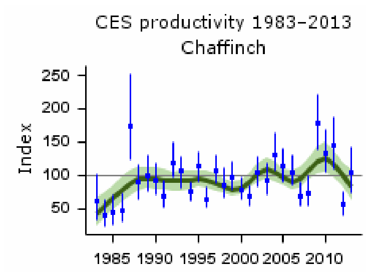
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



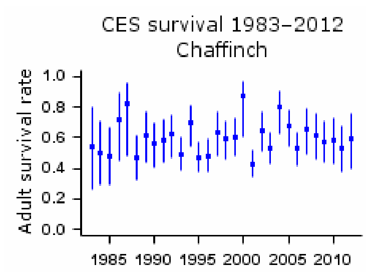
Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



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

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Bullfinch

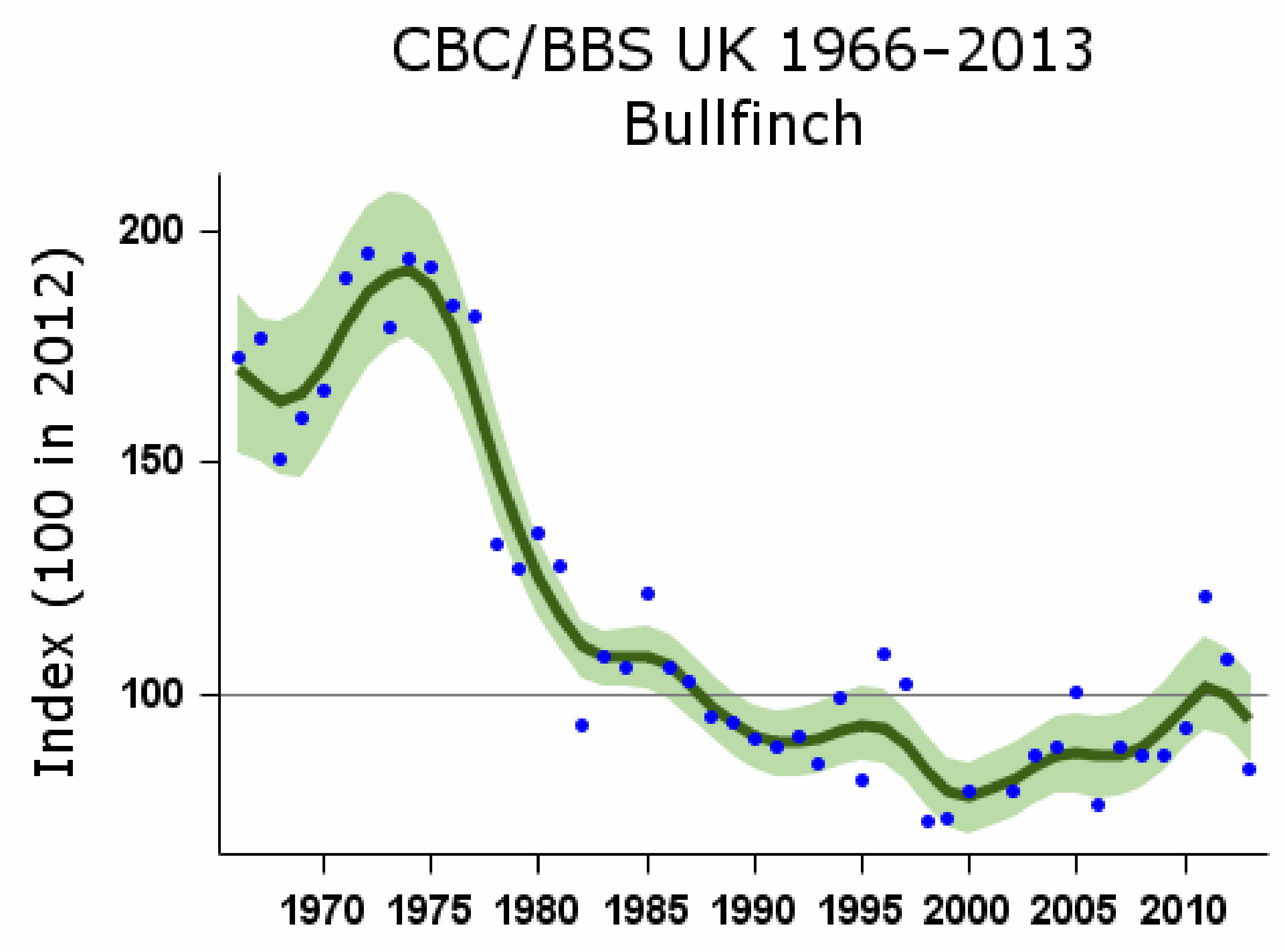
Pyrrhula pyrrhula

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: 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 became shallower and eventually ended around 2000, since when there has been some increase. CES and CBC/BBS both suggest there are large annual fluctuations around the overall long-term trend. The BBS Siriwardena et al. 1999, 2000b, 2001), although a more recent study suggests that changes in adult survival may be important (Robinson et al. 2014). 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, Proffitt et 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 overall. Numbers have shown widespread moderate decrease across Europe since 1980 (PECBMS 2014a). The UK conservation listing was downgraded from red to amber in 2009 (Eaton et al. 2009).



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

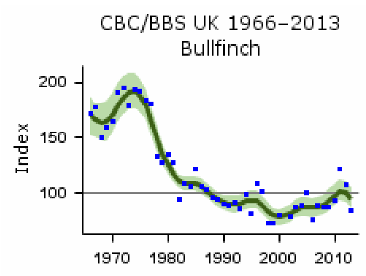
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	45	1967-2012	340	-40	-51	-26	>25	
	25	1987-2012	494	-2	-14	13		

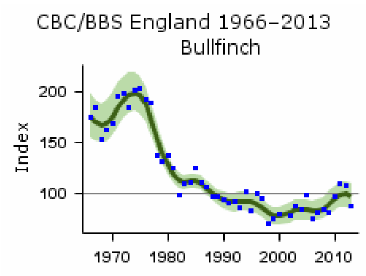
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	10	2002-2012	696	23	14	34		
	5	2007-2012	787	15	9	23		
CBC/BBS England	45	1967-2012	274	-41	-55	-26	>25	
	25	1987-2012	388	-5	-17	10		
	10	2002-2012	537	22	13	34		
	5	2007-2012	610	20	14	28		
CES adults	28	1984-2012	81	-12	-34	12		
	25	1987-2012	86	-22	-39	-5		
	10	2002-2012	84	3	-16	19		
	5	2007-2012	83	13	-1	25		
CES juveniles	28	1984-2012	65	-18	-44	27		
	25	1987-2012	69	-1	-30	38		
	10	2002-2012	69	-1	-31	32		
	5	2007-2012	68	17	-11	50		
BBS UK	17	1995-2012	611	5	-4	13		
	10	2002-2012	696	23	16	36		
	5	2007-2012	787	14	9	21		
BBS England	17	1995-2012	473	5	-4	15		
	10	2002-2012	537	22	14	34		
	5	2007-2012	610	19	12	25		
BBS Scotland	17	1995-2012	41	26	-15	60		
	10	2002-2012	46	35	4	95		
	5	2007-2012	58	15	-5	46		
BBS Wales	17	1995-2012	64	-7	-27	17		
	10	2002-2012	73	3	-14	21		
	5	2007-2012	70	-1	-17	18		
BBS N.Ireland	17	1995-2012	32	20	-23	33		
	10	2002-2012	38	42	9	89		
	5	2007-2012	45	0	-15	15		

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

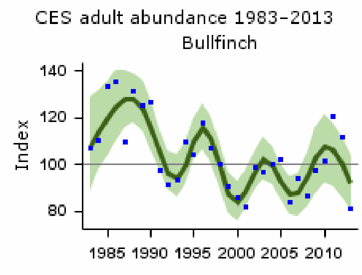
BTO JNCC rspb The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



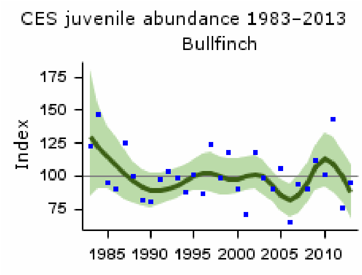
CBC/BBS UK graph



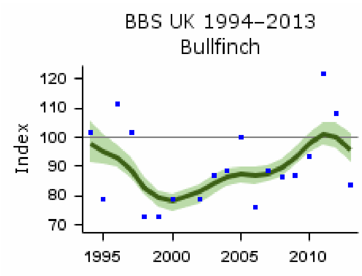
CBC/BBS England graph



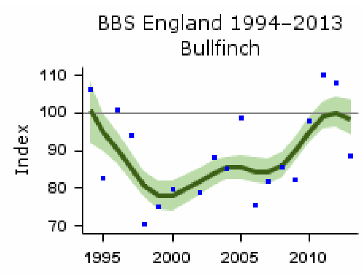
CES adults graph



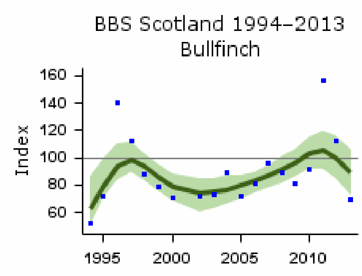
CES juveniles graph



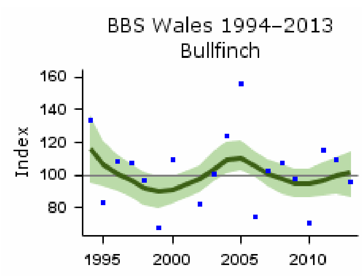
BBS UK graph



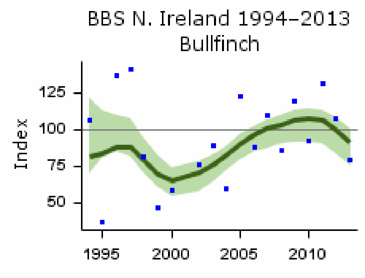
BBS England graph



BBS Scotland graph

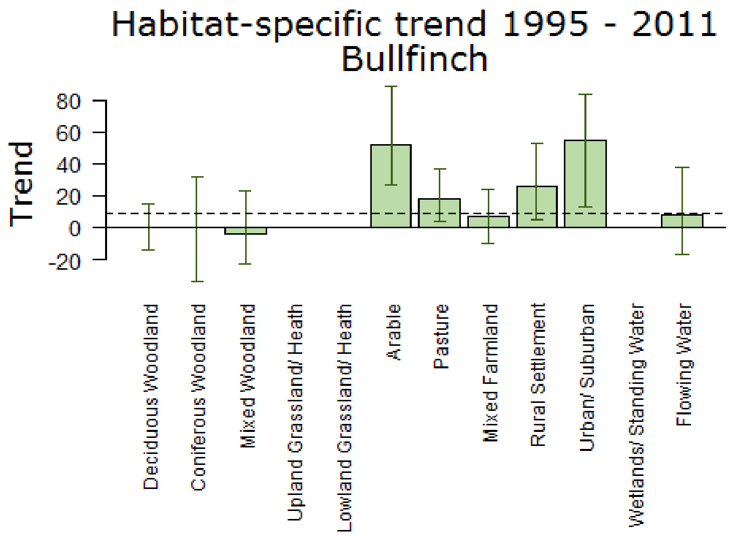


BBS Wales graph



BBS N.Ireland graph

Population trends by habitat



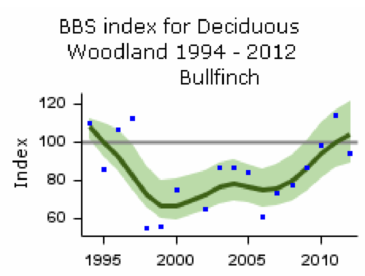
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

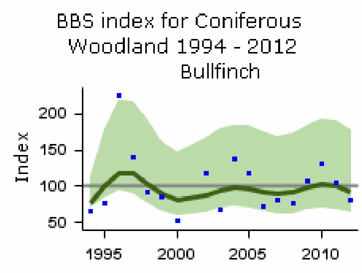
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	148	0	-14	15
Coniferous Woodland	16	1995-2011	33	0	-34	32
Mixed Woodland	16	1995-2011	76	-4	-23	23
Arable	16	1995-2011	94	52	27	89
Pasture	16	1995-2011	221	18	4	37
Mixed Farmland	16	1995-2011	77	7	-10	24
Rural Settlement	16	1995-2011	121	26	4	53
Urban/ Suburban	16	1995-2011	48	55	13	84
Flowing Water	16	1995-2011	64	8	-17	38

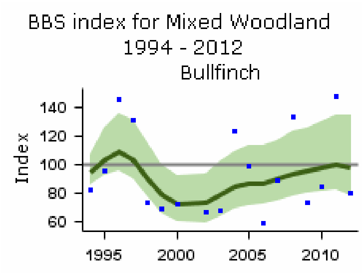
Further information on habitat-specific trends, please follow link here.



Habitat graph



Habitat graph



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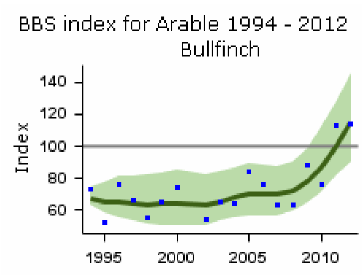
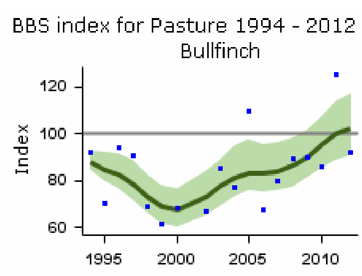
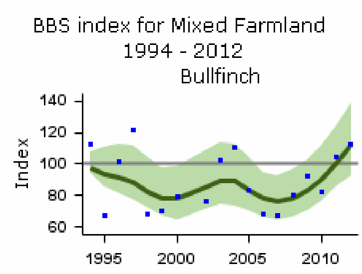


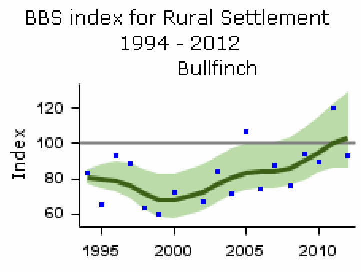
Habitat graph



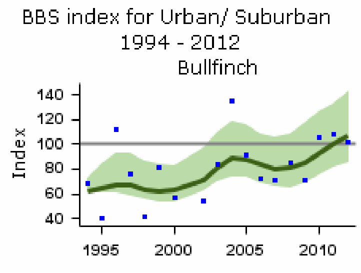
Habitat graph



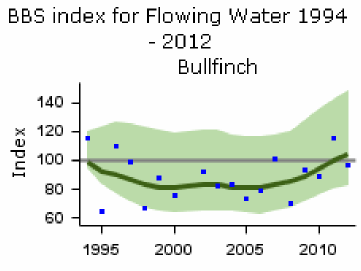
Habitat graph



Habitat graph

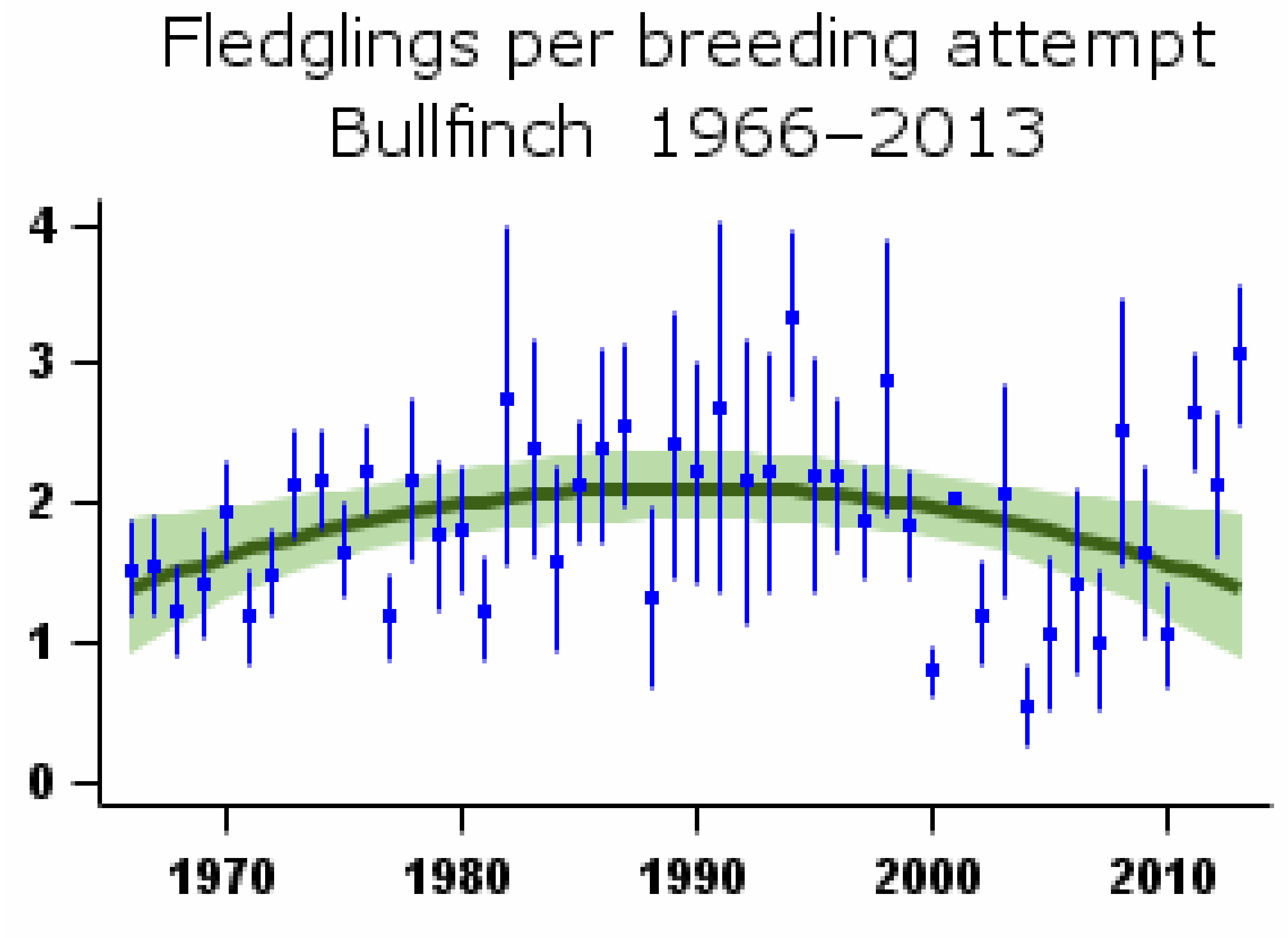


Habitat graph

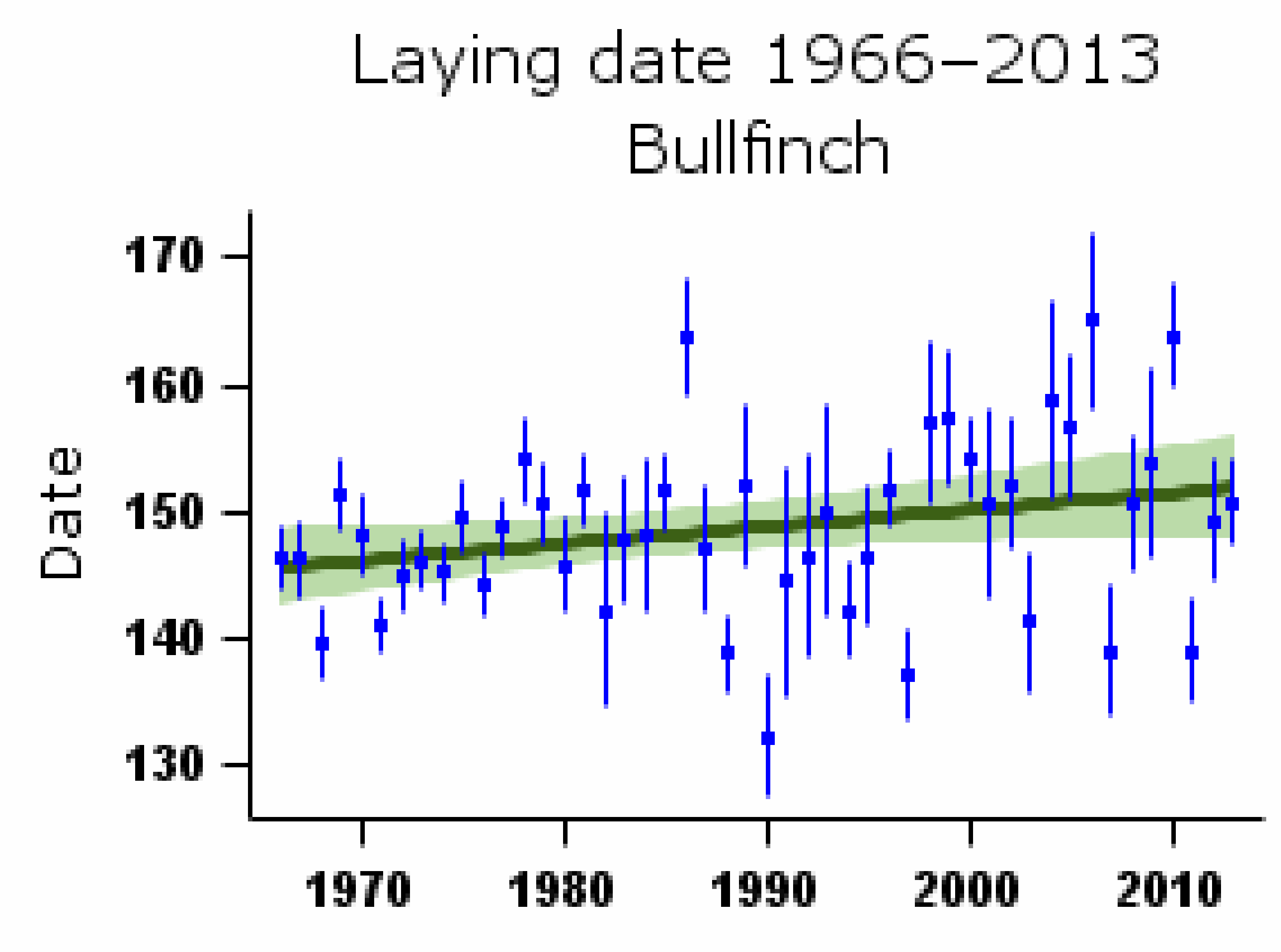


Habitat graph

Demographic trends



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

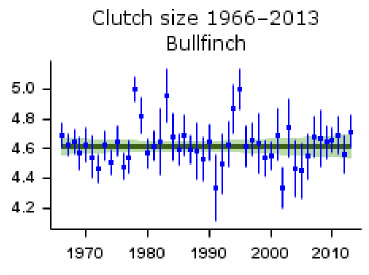


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

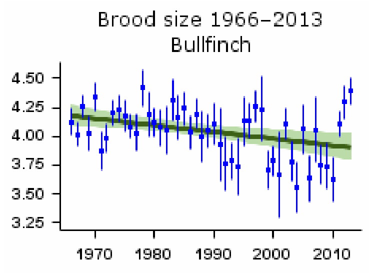
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	34	Curvilinear	1.52 fledglings	1.46 fledglings	-3.9%		
Clutch size	44	1968-2012	36	None					
Brood size	44	1968-2012	37	Linear decline	4.17 chicks	3.91 chicks	-6.1%		
Nest failure rate at egg stage	44	1968-2012	51	None					
Nest failure rate at chick stage	44	1968-2012	34	None					
Laying date	44	1968-2012	34	Linear increase	May 26	Jun 1	6 days		
Juvenile to Adult ratio (CES)	28	1984-2012	85	Smoothed trend	91 Index value	100 Index value	10%		
Juvenile to Adult ratio (CES)	25	1987-2012	91	Smoothed trend	77 Index value	100 Index value	31%		
Juvenile to Adult ratio (CES)	10	2002-2012	89	Smoothed trend	91 Index value	100 Index value	10%		
Juvenile to Adult ratio (CES)	5	2007-2012	86	Smoothed trend	94 Index value	100 Index value	6%		

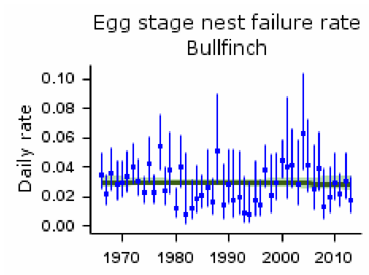
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



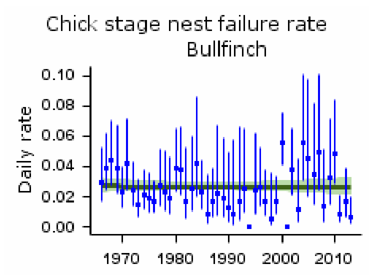
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



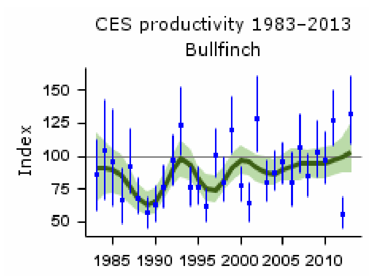
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



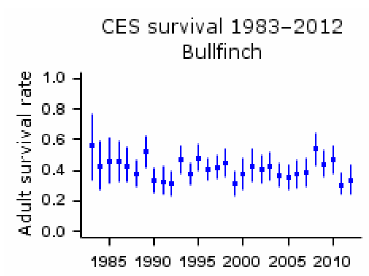
Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



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

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Greenfinch

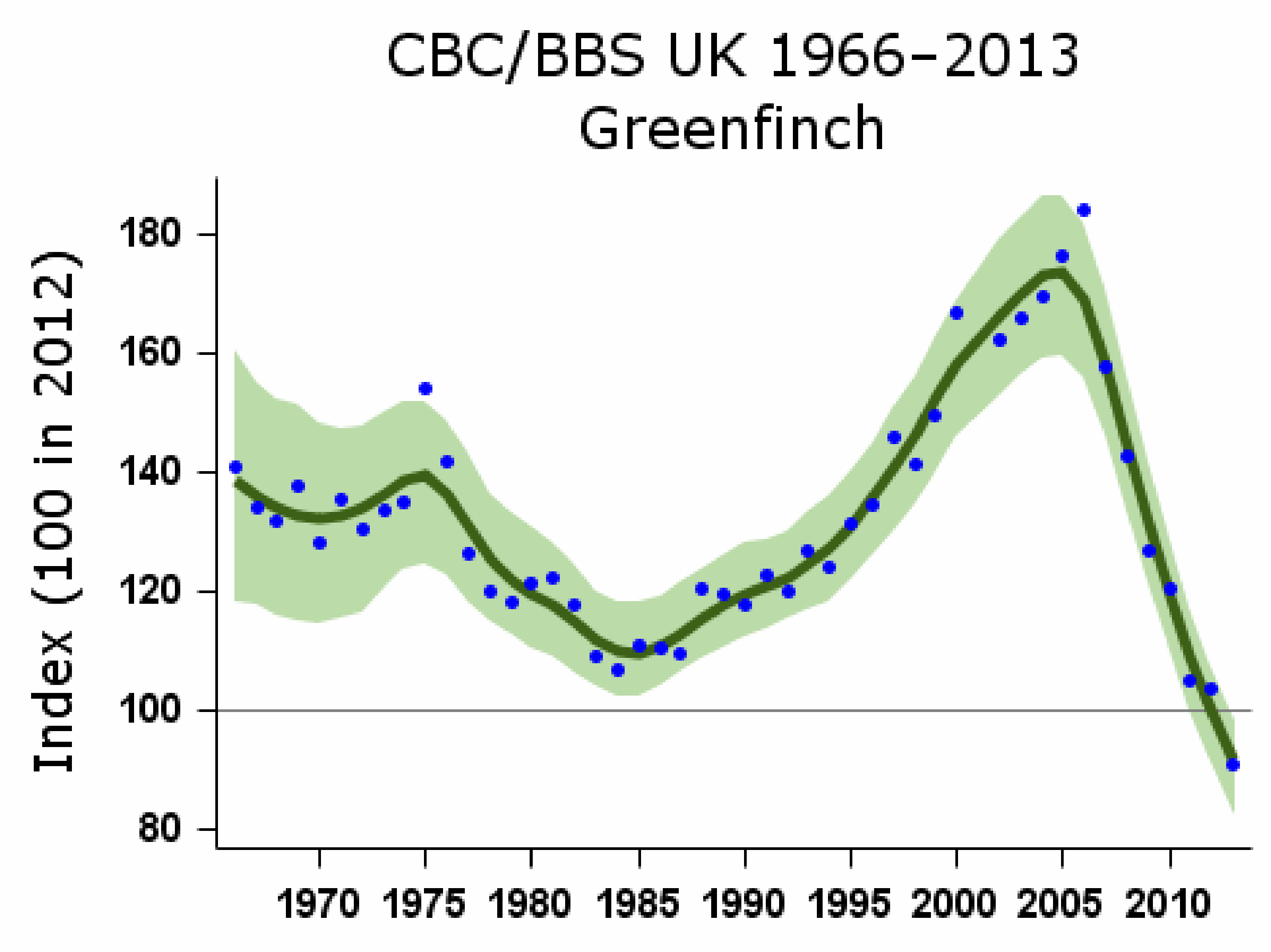
Chloris chloris

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: moderate decline England: shallow decline
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 fluctuated somewhat up to the mid 1990s, but 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 the respiratory disease trichomonosis that began in 2005 (Robinson et al. 2010b, Lawson et al. 2012b). Integrated population modelling shows that changes in survival have indeed been the strongest contributor to annual population change (Robinson et al. 2014). The BBS Crick & Sparks 1999). There has been little change in numbers across Europe since 1980, in strong contrast to the striking changes in the UK (PECBMS 2014a).



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

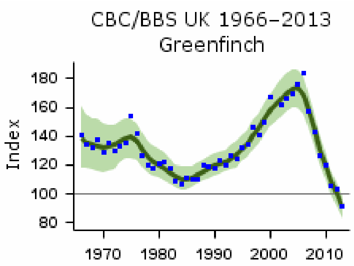
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	45	1967-2012	816	-26	-42	-8	>25	
	25	1987-2012	1348	-11	-25	-1		
	10	2002-2012	2075	-40	-43	-37	>25	
	5	2007-2012	2232	-37	-39	-35	>25	

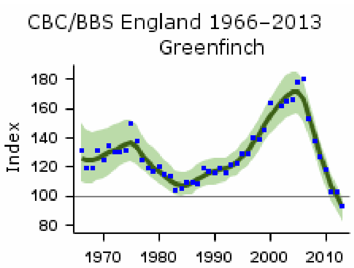
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	45	1967-2012	891	-20	-38	0		
	25	1987-2012	1139	-10	-24	2		
	10	2002-2012	1745	-39	-42	-37	>25	
	5	2007-2012	1888	-36	-38	-34	>25	
CES adults	28	1984-2012	40	8	-45	176		
	25	1987-2012	43	-33	-58	28		
	10	2002-2012	47	-44	-58	-30	>25	
	5	2007-2012	43	-36	-49	-21	>25	
CES juveniles	28	1984-2012	30	132	-1	687		
	25	1987-2012	32	38	-45	364		
	10	2002-2012	39	44	-12	102		
	5	2007-2012	36	4	-20	63		
BBS UK	17	1995-2012	1825	-23	-27	-18		
	10	2002-2012	2075	-40	-42	-37	>25	
	5	2007-2012	2232	-36	-39	-34	>25	
BBS England	17	1995-2012	1537	-21	-26	-17		
	10	2002-2012	1745	-39	-42	-37	>25	
	5	2007-2012	1888	-35	-38	-34	>25	
BBS Scotland	17	1995-2012	109	-32	-46	-16	>25	
	10	2002-2012	122	-33	-45	-20	>25	
	5	2007-2012	137	-38	-46	-30	>25	
BBS Wales	17	1995-2012	114	-15	-38	-1		
	10	2002-2012	131	-53	-62	-40	>50	
	5	2007-2012	128	-44	-54	-34	>25	
BBS N.Ireland	17	1995-2012	51	-15	-45	27		
	10	2002-2012	62	-57	-67	-48	>50	
	5	2007-2012	61	-48	-59	-42	>25	

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

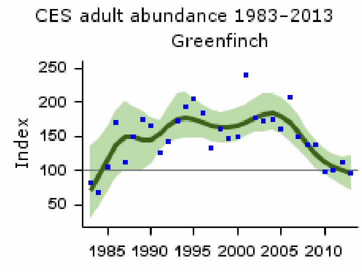
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



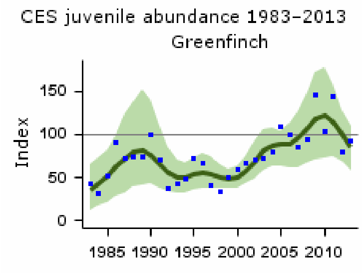
CBC/BBS UK graph



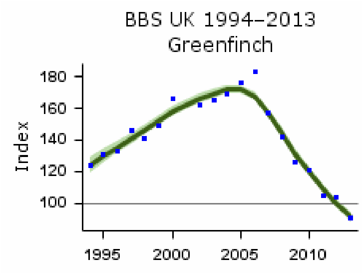
CBC/BBS England graph



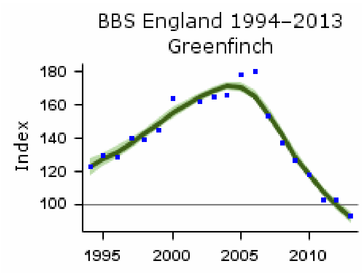
CES adults graph



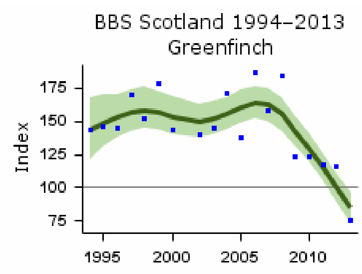
CES juveniles graph



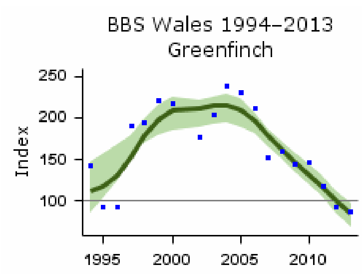
BBS UK graph



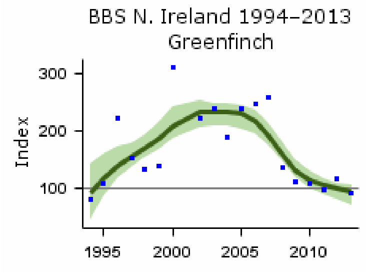
BBS England graph



BBS Scotland graph

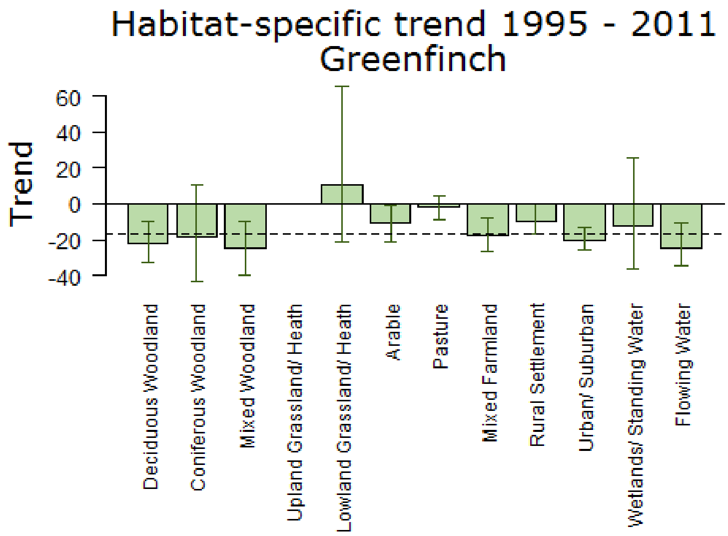


BBS Wales graph



BBS N.Ireland graph

Population trends by habitat



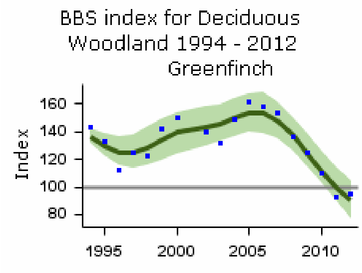
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

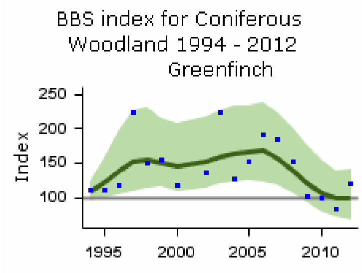
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	353	-23	-33	-10
Coniferous Woodland	16	1995-2011	48	-18	-43	11
Mixed Woodland	16	1995-2011	153	-25	-40	-9
Lowland Grassland/ Heath	16	1995-2011	58	10	-21	66
Arable	16	1995-2011	468	-10	-21	-1
Pasture	16	1995-2011	843	-2	-9	5
Mixed Farmland	16	1995-2011	437	-18	-27	-8
Rural Settlement	16	1995-2011	698	-10	-17	0
Urban/ Suburban	16	1995-2011	377	-21	-26	-13
Wetlands/ Standing Water	16	1995-2011	49	-12	-37	26
Flowing Water	16	1995-2011	252	-25	-35	-11

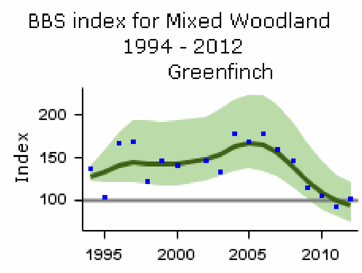
Further information on habitat-specific trends, please follow link here.



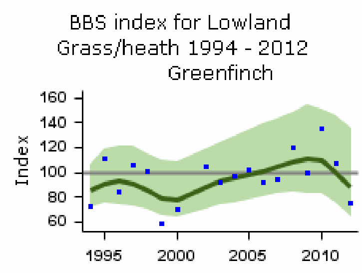
Habitat graph



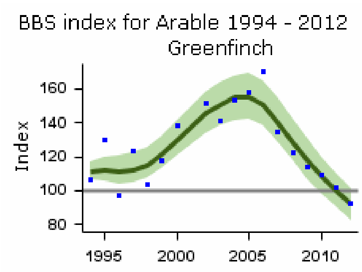
Habitat graph



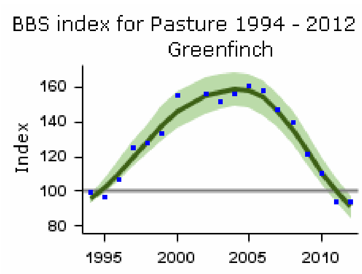
Habitat graph



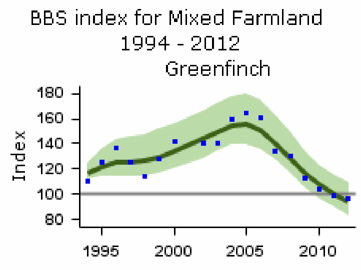
Habitat graph



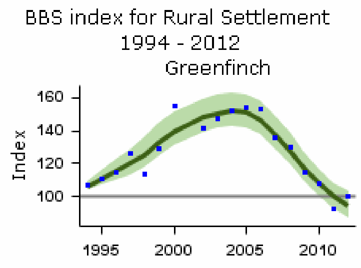
Habitat graph



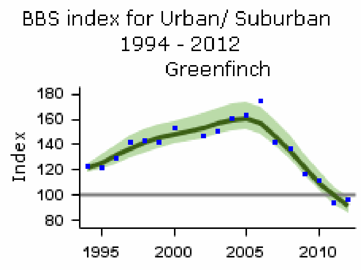
Habitat graph



Habitat graph



Habitat graph



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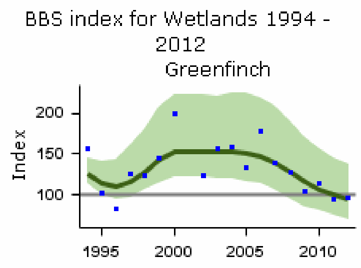
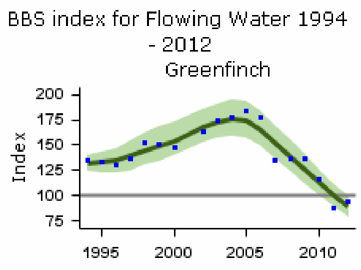
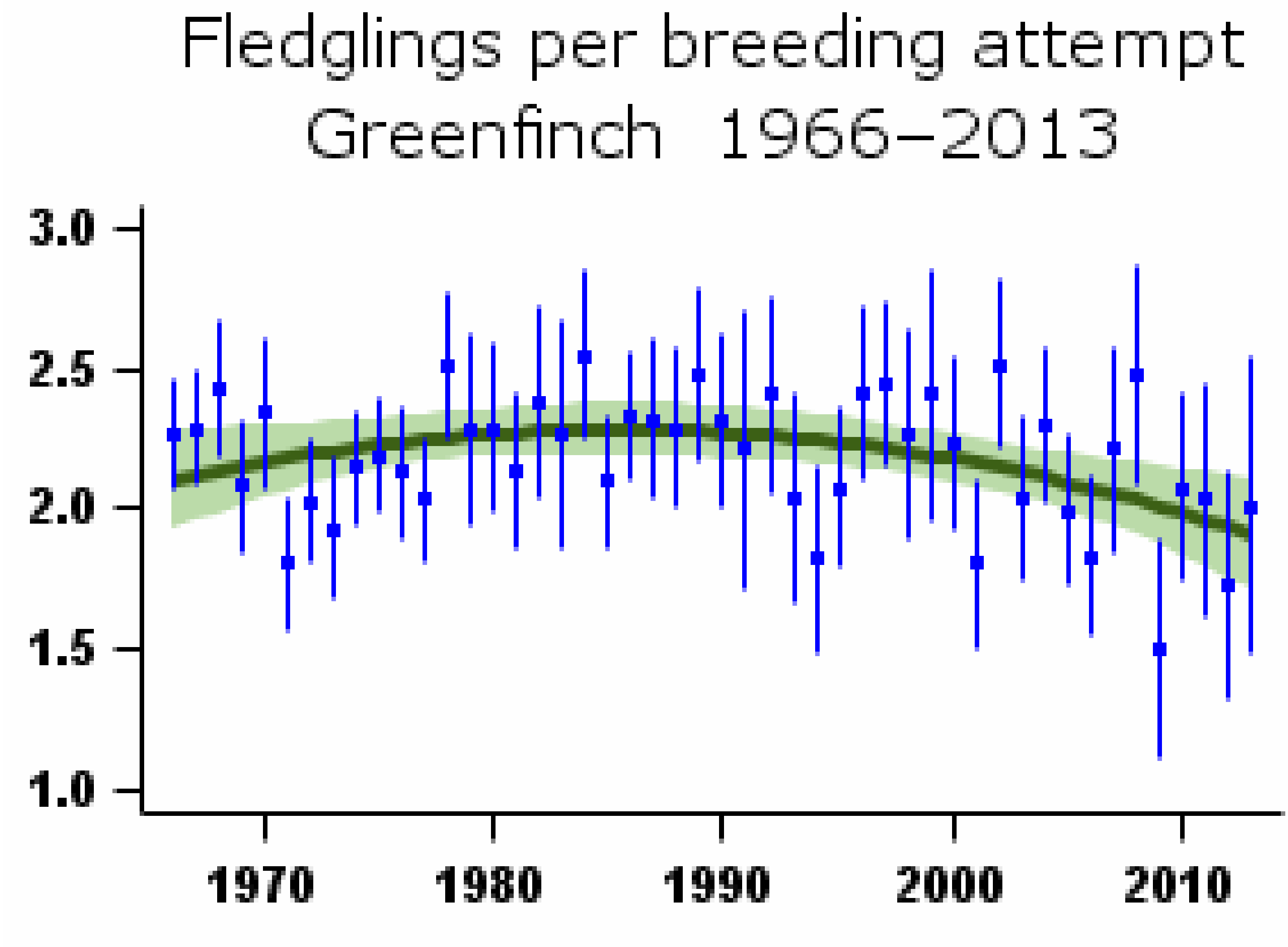


Habitat graph

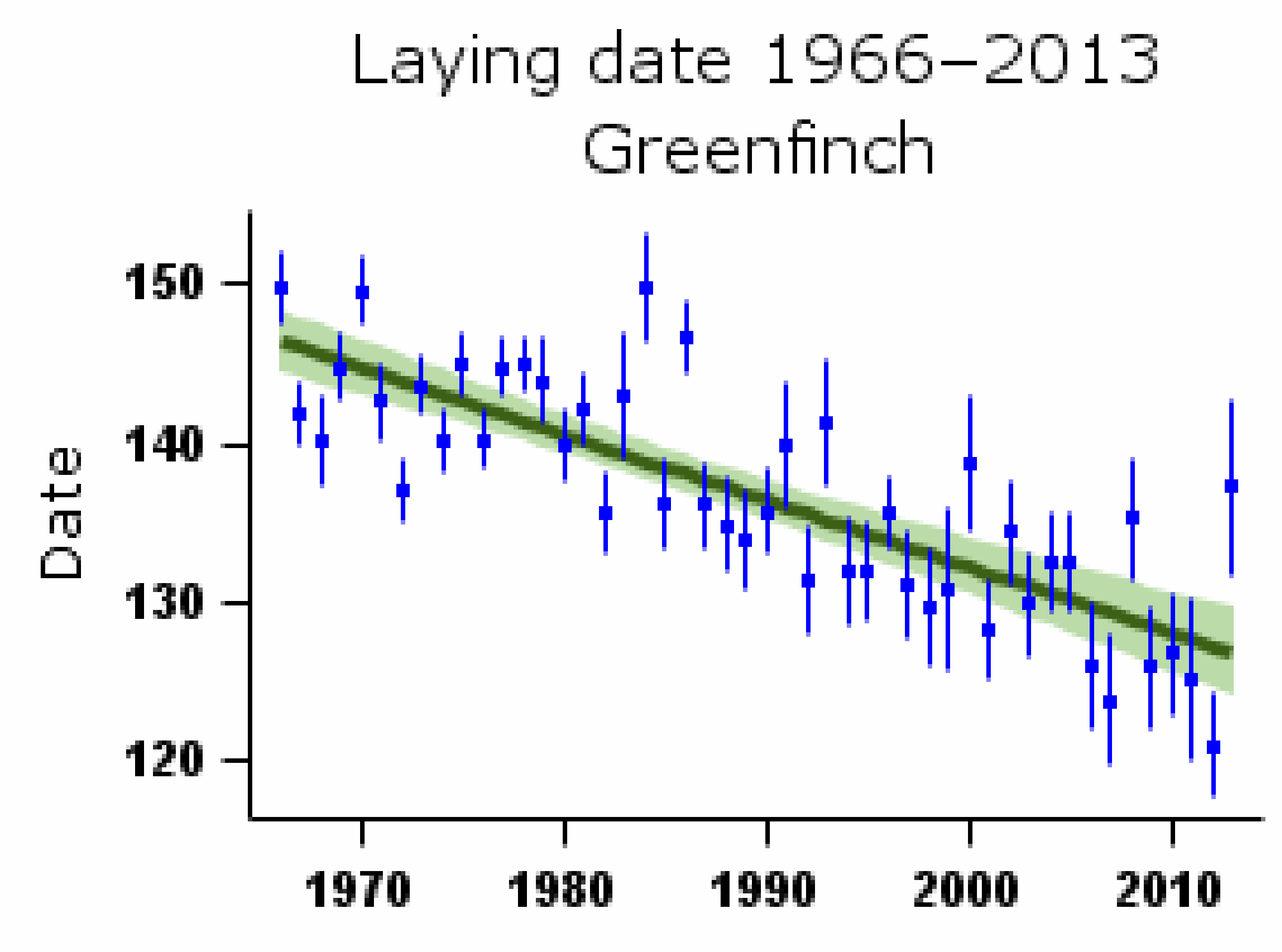


Habitat graph

Demographic trends



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

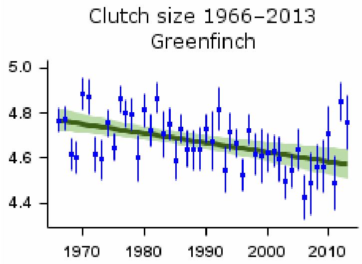


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

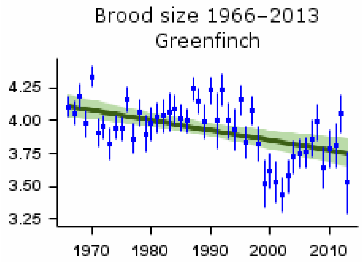
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	90	Curvilinear	2.14 fledglings	1.94 fledglings	-9.3%		
Clutch size	44	1968-2012	88	Linear decline	4.76 eggs	4.57 eggs	-3.9%		
Brood size	44	1968-2012	109	Linear decline	4.10 chicks	3.76 chicks	-8.2%		
Nest failure rate at egg stage	44	1968-2012	122	Curvilinear	2.60% nests/day	2.08% nests/day	-20.0%		
Nest failure rate at chick stage	44	1968-2012	90	None					
Laying date	44	1968-2012	90	Linear decline	May 26	May 7	-19 days		
Juvenile to Adult ratio (CES)	28	1984-2012	46	Smoothed trend	101 Index value	100 Index value	-1%		
Juvenile to Adult ratio (CES)	25	1987-2012	49	Smoothed trend	78 Index value	100 Index value	27%		
Juvenile to Adult ratio (CES)	10	2002-2012	55	Smoothed trend	58 Index value	100 Index value	74%		
Juvenile to Adult ratio (CES)	5	2007-2012	51	Smoothed trend	63 Index value	100 Index value	58%		

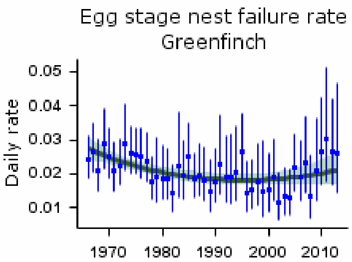
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



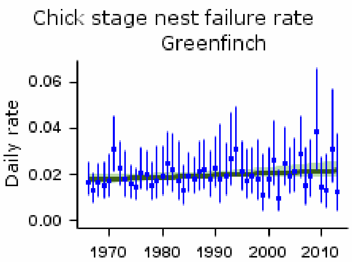
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



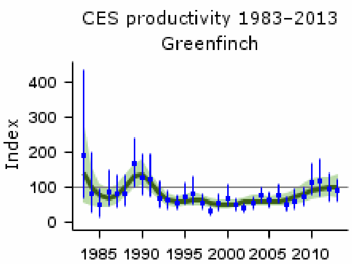
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



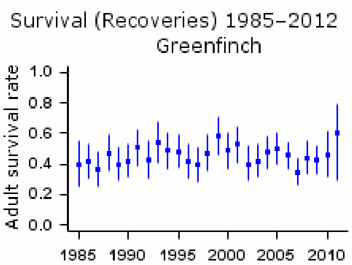
Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



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 based on dead recoveries of ringed birds - error bars represent 95% confidence limits

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Linnet

Linaria cannabina

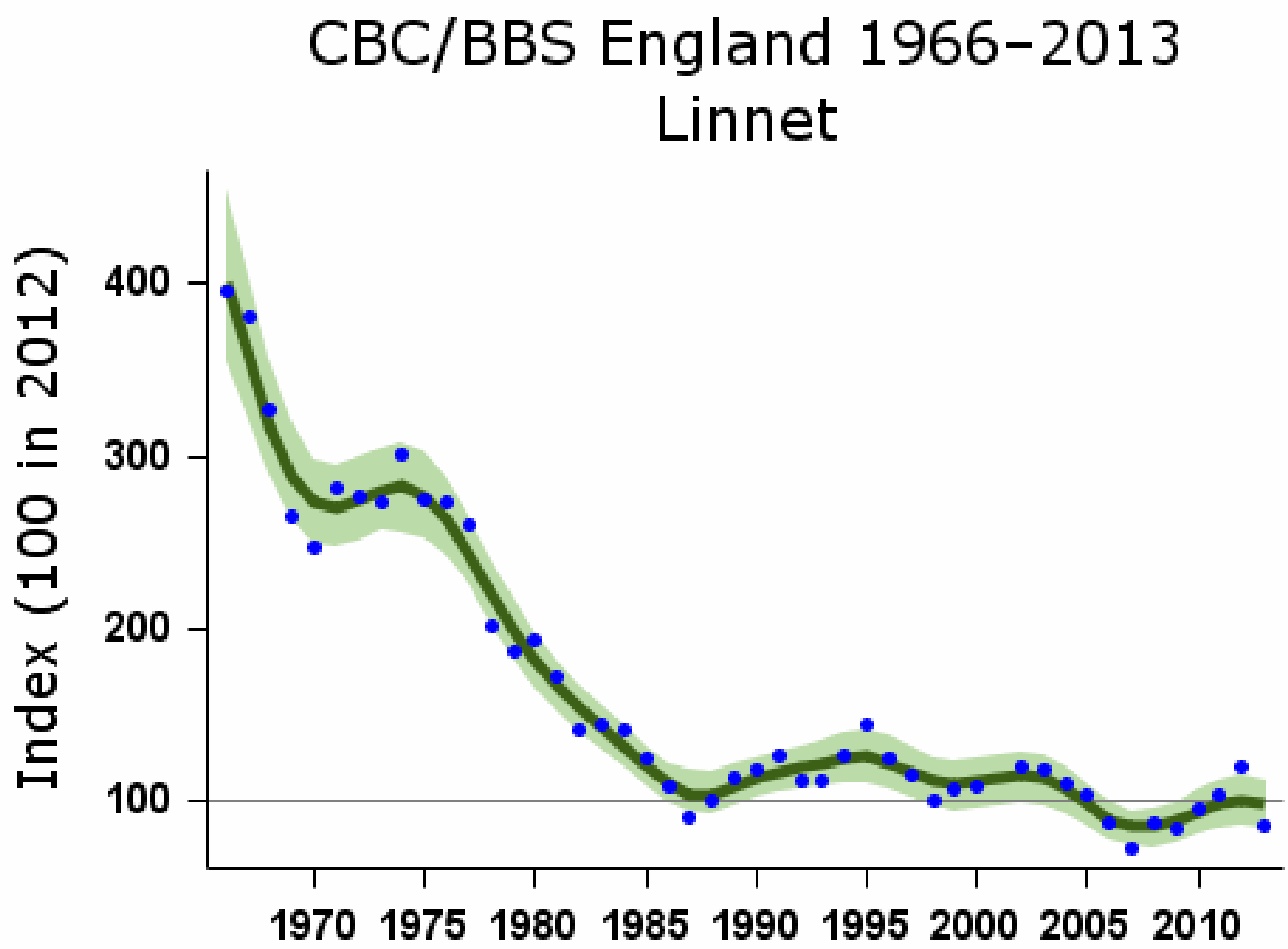
Key facts

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: 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 in the late 1960s, and again between the mid 1970s and mid 1980s, but decrease has been followed by a long period of relative stability. Numbers have fallen further in Britain since the start of BBS in 1994, but there has been some increase in Northern Ireland. The BBS PECBMS 2014a), and the European status of this species is no longer considered 'secure' (BirdLife International 2004).



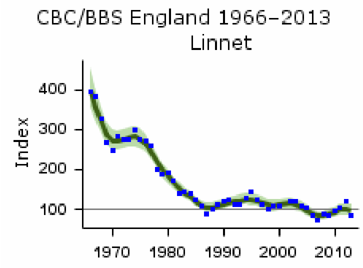
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

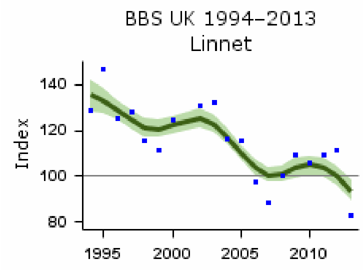
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	45	1967-2012	467	-72	-79	-65	>50	
	25	1987-2012	745	-4	-21	20		
	10	2002-2012	1043	-13	-18	-6		
	5	2007-2012	1110	19	12	26		
BBS UK	17	1995-2012	1213	-25	-30	-19		
	10	2002-2012	1295	-20	-26	-14		
	5	2007-2012	1370	-1	-6	5		
BBS England	17	1995-2012	983	-23	-29	-16		
	10	2002-2012	1043	-12	-18	-6		
	5	2007-2012	1110	17	10	24		
BBS Scotland	17	1995-2012	92	-29	-41	-5	>25	
	10	2002-2012	98	-37	-50	-13	>25	
	5	2007-2012	106	-37	-46	-21	>25	
BBS Wales	17	1995-2012	93	-28	-45	-4	>25	
	10	2002-2012	101	-39	-50	-24	>25	
	5	2007-2012	96	-6	-23	12		
BBS N.Ireland	17	1995-2012	37	13	-26	56		
	10	2002-2012	44	-27	-46	3		
	5	2007-2012	49	-39	-51	-20	>25	

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

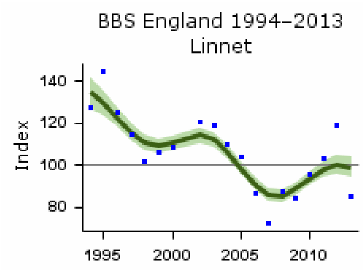
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



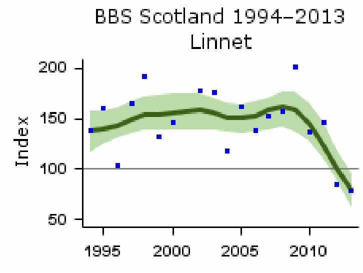
CBC/BBS England graph



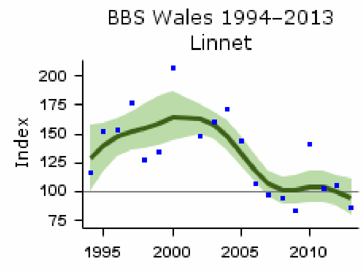
BBS UK graph



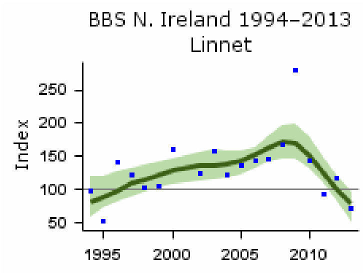
BBS England graph



BBS Scotland graph

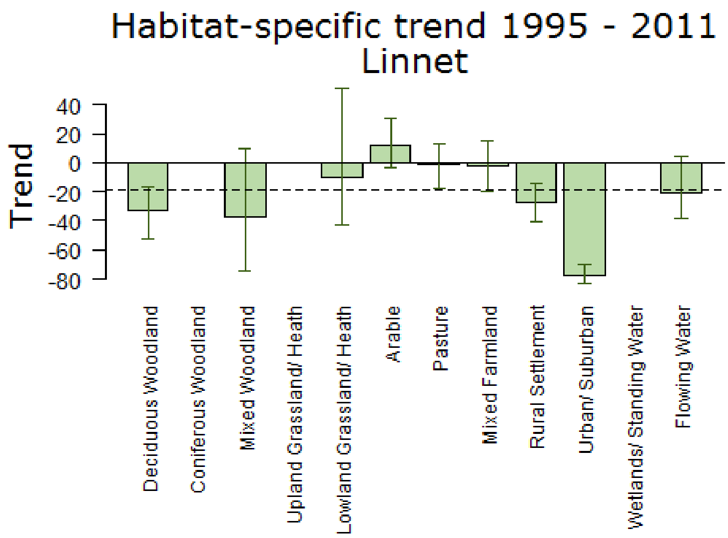


BBS Wales graph



BBS N.Ireland graph

Population trends by habitat



Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

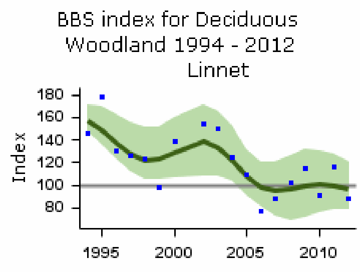
Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

More on habitat trends

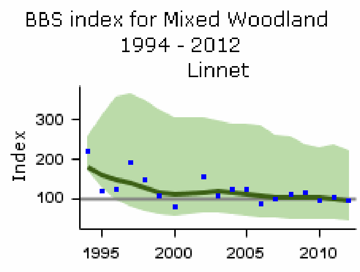
Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	119	-33	-53	-16

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Mixed Woodland	16	1995-2011	46	-37	-75	10
Lowland Grassland/ Heath	16	1995-2011	71	-10	-43	51
Arable	16	1995-2011	313	12	-3	30
Pasture	16	1995-2011	468	-1	-18	13
Mixed Farmland	16	1995-2011	252	-2	-19	15
Rural Settlement	16	1995-2011	244	-28	-40	-14
Urban/ Suburban	16	1995-2011	65	-78	-83	-70
Flowing Water	16	1995-2011	93	-21	-38	4

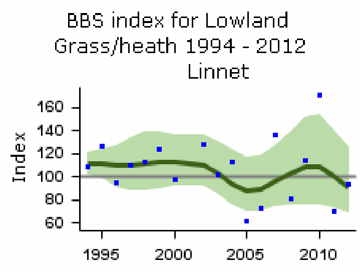
Further information on habitat-specific trends, please follow link here.



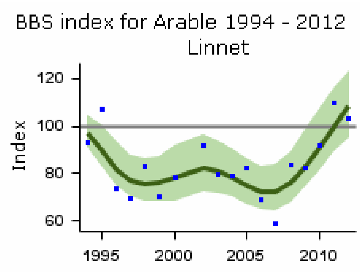
Habitat graph



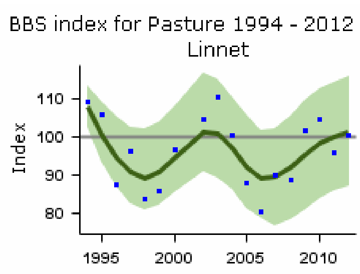
Habitat graph



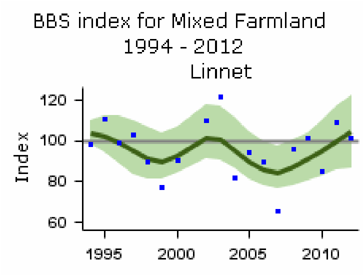
Habitat graph



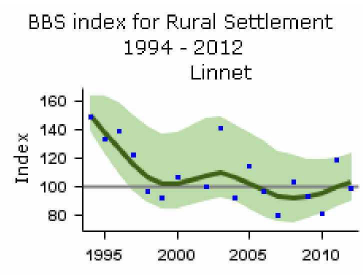
Habitat graph



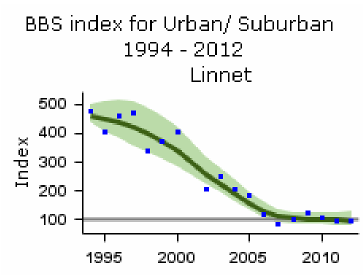
Habitat graph



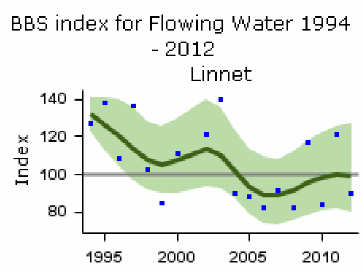
Habitat graph



Habitat graph

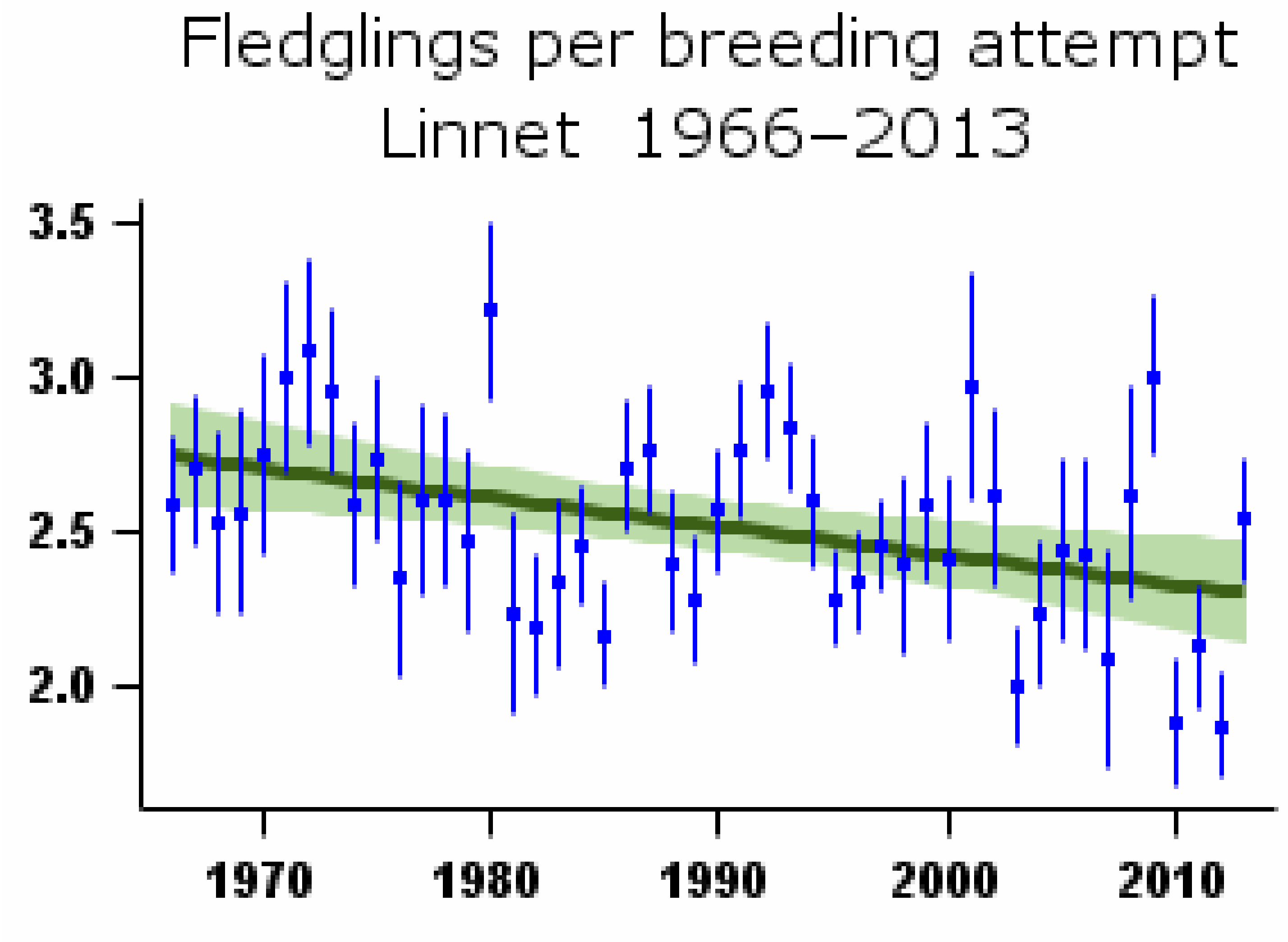


Habitat graph

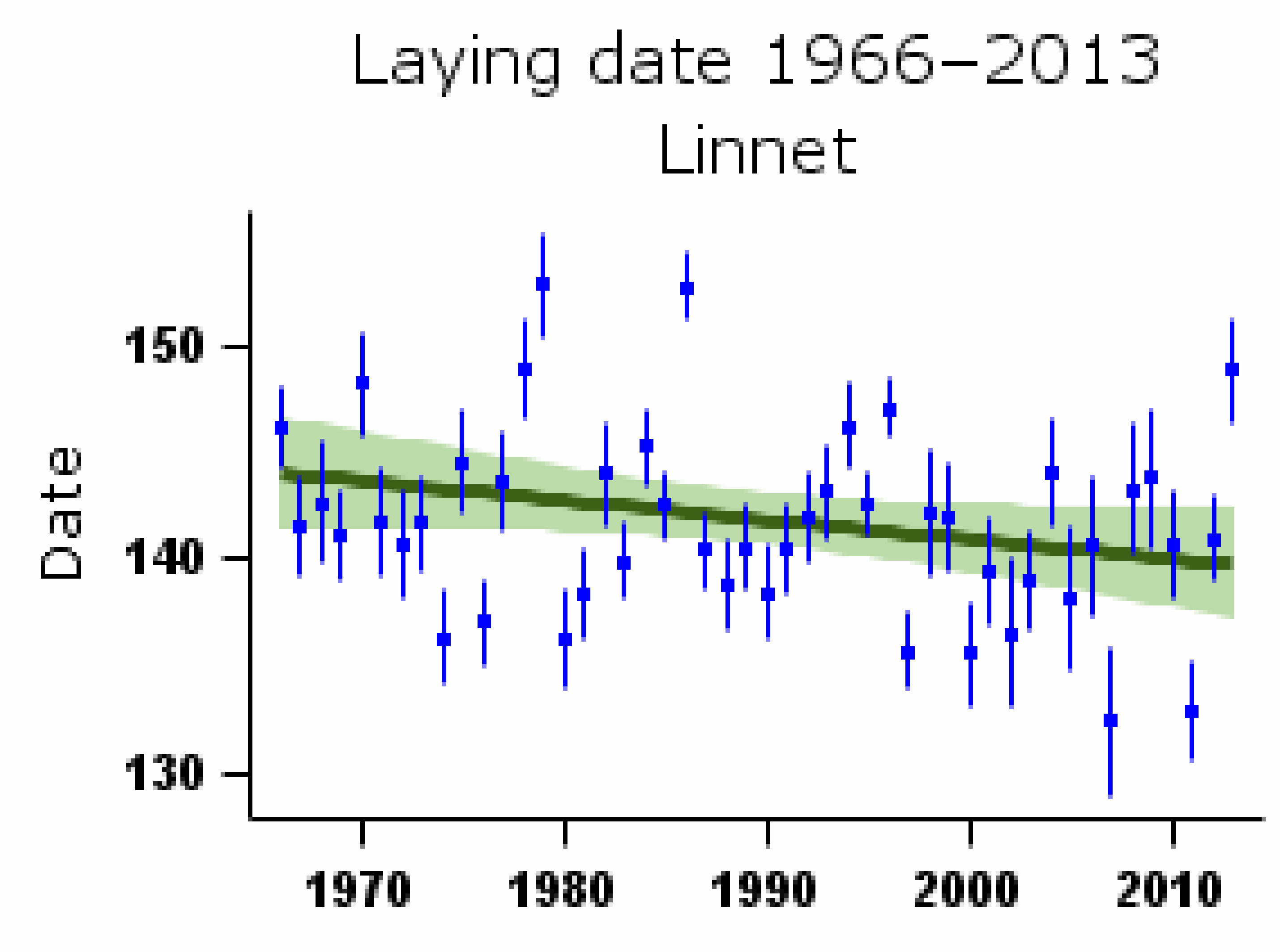


Habitat graph

Demographic trends



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

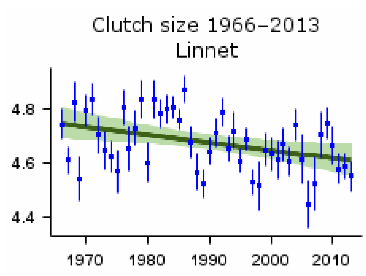


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

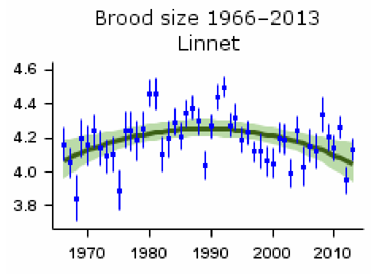
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	123	Linear decline	2.72 fledglings	2.31 fledglings	-15.2%		
Clutch size	44	1968-2012	124	Linear decline	4.74 eggs	4.61 eggs	-2.7%		
Brood size	44	1968-2012	142	Curvilinear	4.10 chicks	4.07 chicks	-0.8%		
Nest failure rate at egg stage	44	1968-2012	173	Linear increase	1.80% nests/day	2.44% nests/day	35.6%		
Nest failure rate at chick stage	44	1968-2012	123	Linear increase	1.50% nests/day	2.37% nests/day	58.0%		
Laying date	44	1968-2012	127	None			0 days		

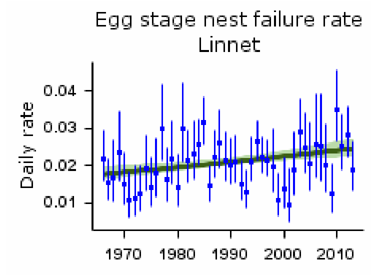
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



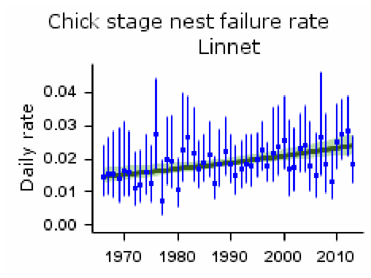
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



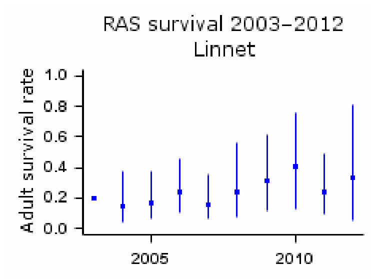
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



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



Proportion of adult birds surviving to following year - error bars represent 95% confidence limits

Causes of change

There is convincing evidence that nest failure rates 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). 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 more likely, although these hypotheses were not tested. BTO monitoring data do not permit analysis of these parameters but 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 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.

After 1986, egg-stage nest survival increased and this 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 ending of population decline (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.

The current long-term pattern, spanning the Linnet's periods of decrease and relative stability, is of linear increase in nest failure rates and linear decline in the number of fledglings per breeding attempt.

This report should be cited as: Baillie, S.R., Marchant, J.H., Leech, D.I., Massimino, D., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Lesser Redpoll

Acanthis cabaret

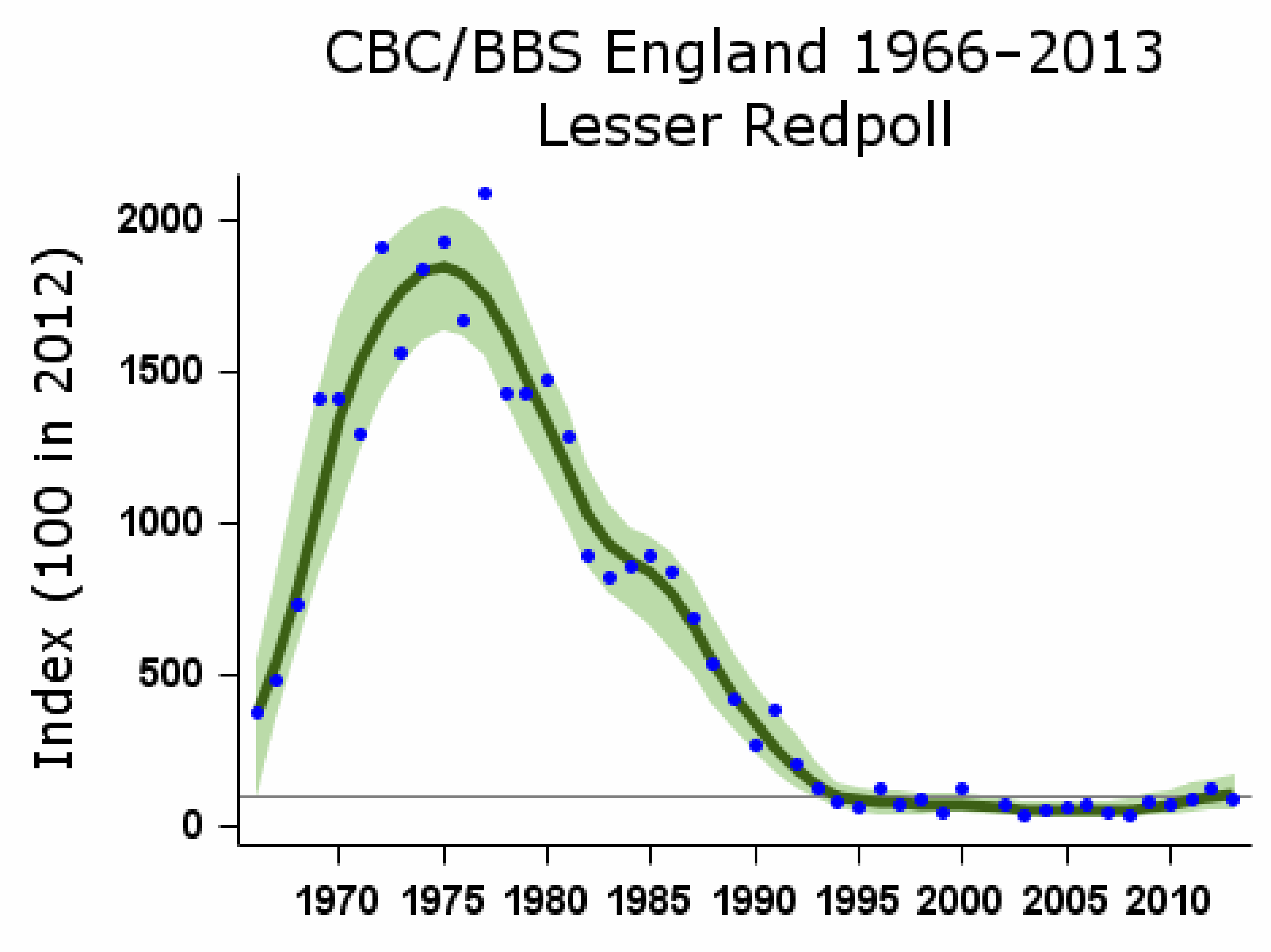
Key facts

Conservation listings:	Europe (A. 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 then on CBC and CES plots, but, concurrent with a sustained period of severe decline, have withdrawn completely as breeding birds from large areas of lowland England (Balmer et al. 2013). Uncertainty about the representativeness of the monitoring data prior to the establishment of BBS initially denied the species a place among birds of conservation concern, since it was thought possible that the populatior may have withdrawn from the lowlands to northern and western UK regions, where monitoring prior to 1994 was less effective. Since a range contraction of 11% between 1968-72 and 1988-91 was evident in all parts of the UK (Gibbons et al. 1993), however, it is perhaps more likely that decrease was general. Accordingly the species was moved from green to amber in 2002 and in 2009 to the red list. Since Acanthis cabaret is currently treated by BOU as a separate species from the Common Redpoll A. flammea, and has a restricted range that lies wholly within western Europe, it arguably warrants a European conservation listing at the next review. The taxonomic status o cabaret remains controversial, however (Stoddart 2013). Recent UK data show a general strong increase although, especially in lowland areas, the population remains very severely depleted. A rapid increase has been recorded in the Republic of Ireland since 1998 (Crowe 2012). The European trend for cabaret and flammea together is of moderate decline since 1980 (PECBMS 2014a).



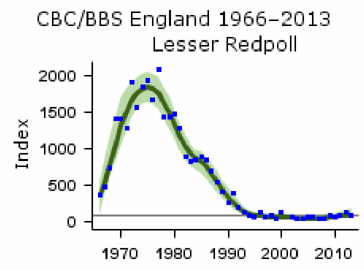
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

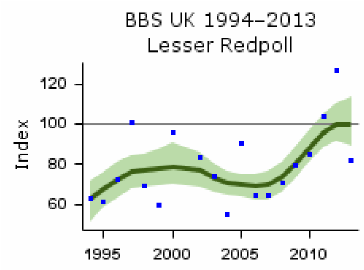
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	45	1967-2012	49	-82	-93	-60	>50	
	25	1987-2012	52	-85	-93	-73	>50	Small CBC sample
	10	2002-2012	77	61	1	111		
	5	2007-2012	89	86	49	131		
BBS UK	17	1995-2012	167	48	23	87		
	10	2002-2012	191	30	5	62		
	5	2007-2012	230	42	28	72		
BBS England	17	1995-2012	67	21	-15	81		
	10	2002-2012	77	60	0	126		
	5	2007-2012	89	84	42	128		
BBS Scotland	17	1995-2012	47	31	-3	87		
	10	2002-2012	52	10	-14	54		
	5	2007-2012	67	51	19	87		
BBS N.Ireland	17	1995-2012	31	80				
	10	2002-2012	36	21				
	5	2007-2012	45	-8				

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

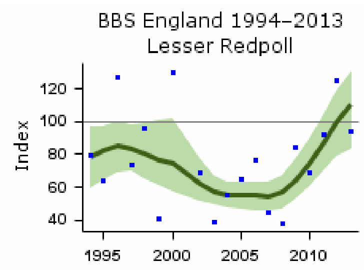
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



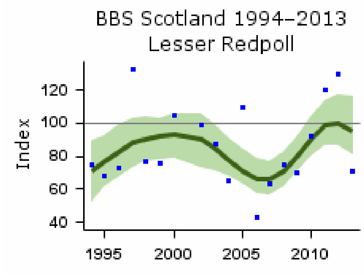
CBC/BBS England graph



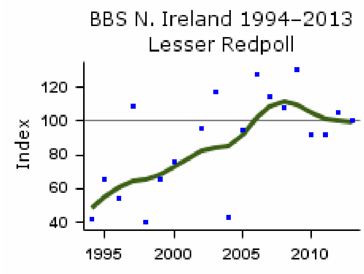
BBS UK graph



BBS England graph



BBS Scotland graph



BBS N.Ireland 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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Common Crossbill

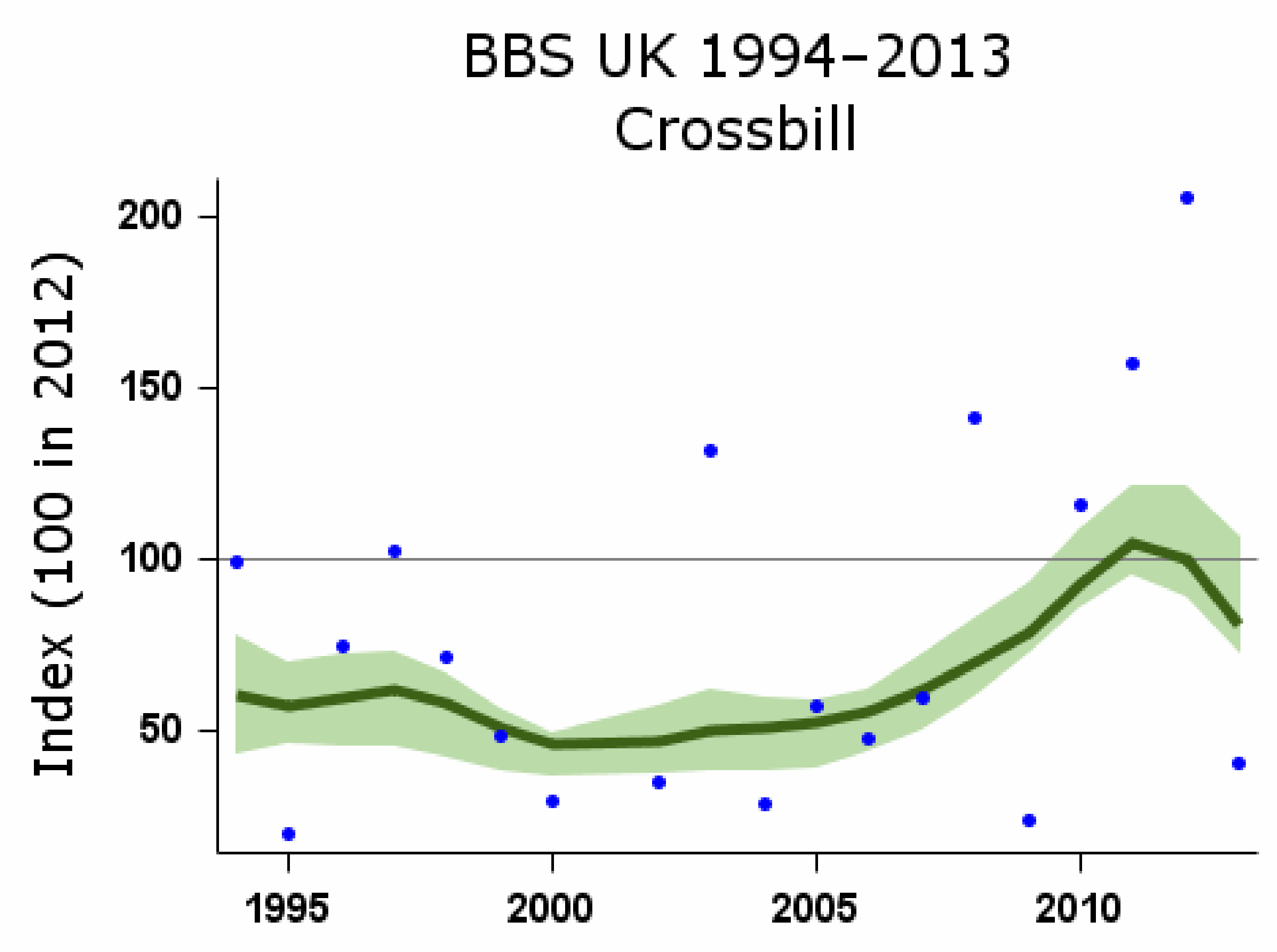
Loxia curvirostra

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, even 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 the irregular arrivals into 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 eruptive movements is a failure of the cone crop, especially of 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. Atlas data for 2008-11 confirm that Crossbills are currently at a high level of abundance (Balmer et al. 2013) but it is not clear whether recent increase is part of any long-term trend.



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

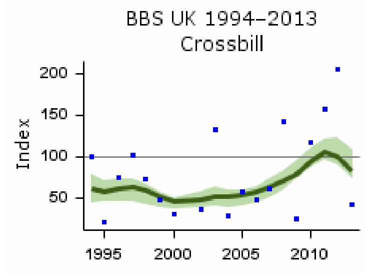
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	17	1995-2012	60	74	34	166		
	10	2002-2012	73	112	61	233		

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
	5	2007-2012	94	60	27	144		

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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Goldfinch

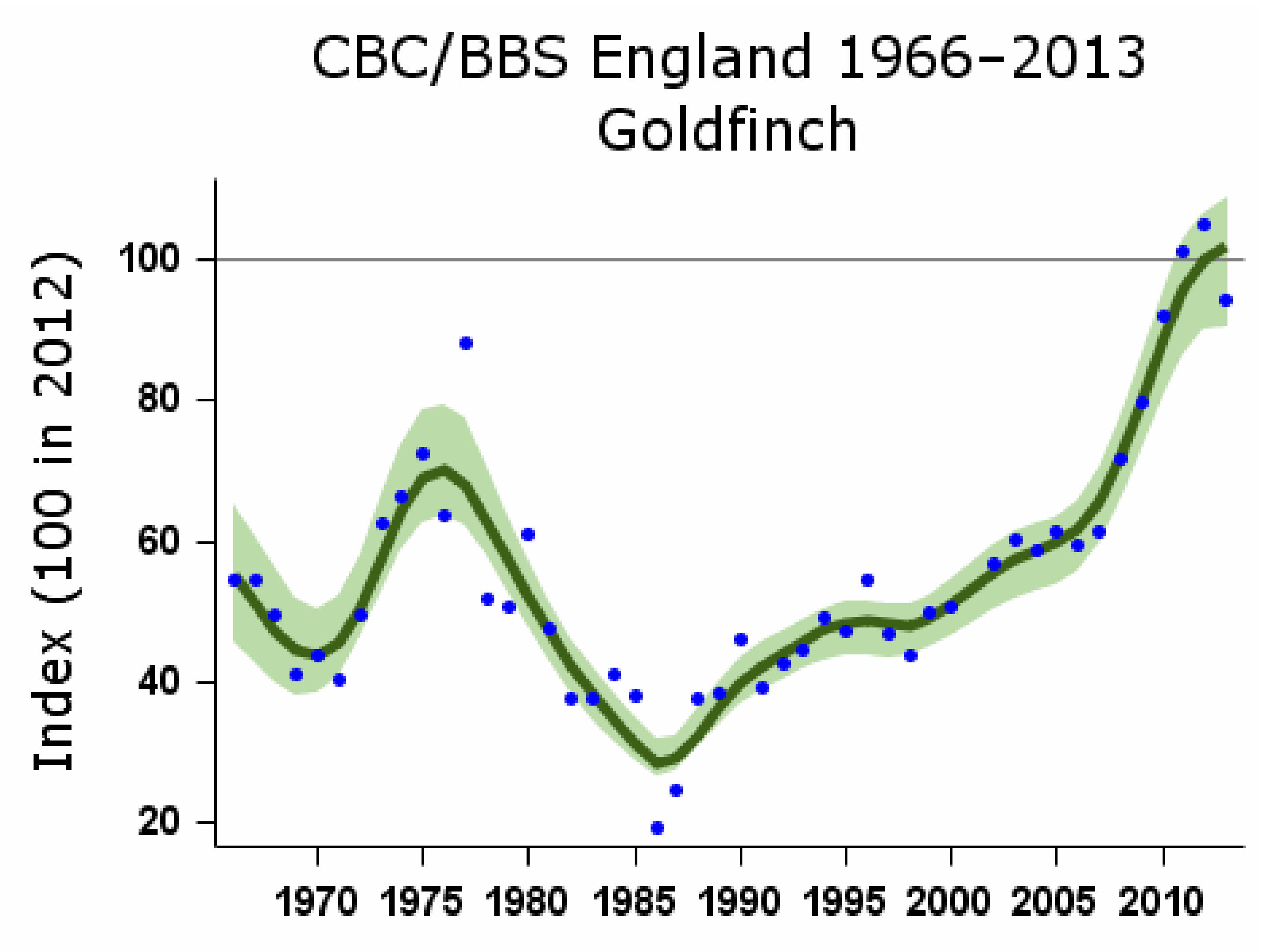
Carduelis carduelis

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 current upturn has lifted the species from the amber list of conservation concern into the green category, and has been accompanied by an increase in its use of gardens for winter feeding. The BBS Siriwardena et al. 1999). There have been no clear changes in productivity as measured by NRS and CES. The recent severe losses of Crick & Sparks 1999). There has been widespread moderate increase across Europe since 1980, though with little change since 1990 (PECBMS 2014a). A strong increase has been recorded in the Republic of Ireland since 1998 (Crowe 2012).



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

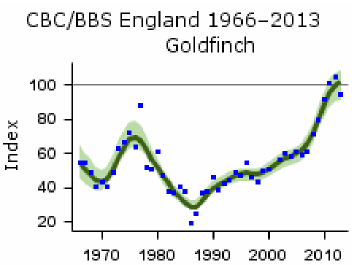
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	45	1967-2012	585	96	44	148		
	25	1987-2012	981	243	181	286		
	10	2002-2012	1589	80	70	88		
	5	2007-2012	1890	52	47	57		

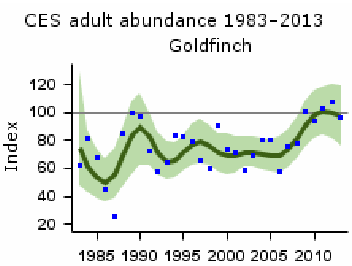
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CES adults	28	1984-2012	32	63	-7	176		
	25	1987-2012	34	79	11	241		
	10	2002-2012	40	41	8	93		
	5	2007-2012	42	37	8	78		
CES juveniles	28	1984-2012	22	-11	-55	321		
	25	1987-2012	24	93	4	297		
	10	2002-2012	28	69	15	182		
	5	2007-2012	30	92	25	194		
BBS UK	17	1995-2012	1627	112	99	125		
	10	2002-2012	1930	71	63	79		
	5	2007-2012	2274	43	37	48		
BBS England	17	1995-2012	1341	104	89	115		
	10	2002-2012	1589	80	70	91		
	5	2007-2012	1890	51	45	55		
BBS Scotland	17	1995-2012	96	160	91	255		
	10	2002-2012	114	75	37	123		
	5	2007-2012	139	33	11	55		
BBS Wales	17	1995-2012	130	80	46	120		
	10	2002-2012	150	6	-10	27		
	5	2007-2012	155	14	1	28		
BBS N.Ireland	17	1995-2012	49	814				
	10	2002-2012	66	130				
	5	2007-2012	77	34				

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

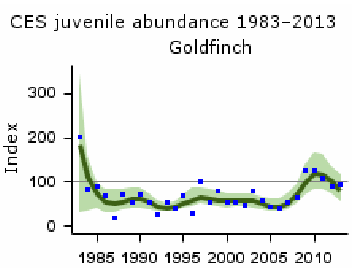
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



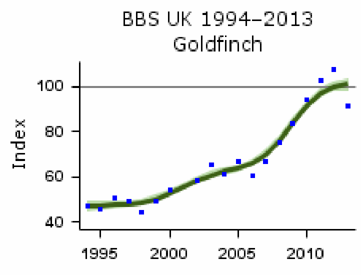
CBC/BBS England graph



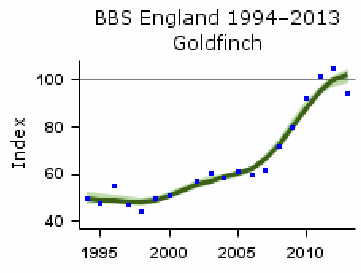
CES adults graph



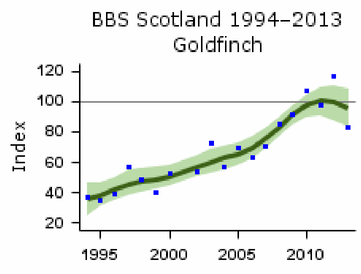
CES juveniles graph



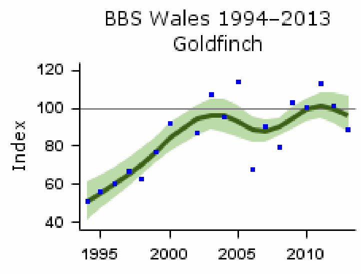
BBS UK graph



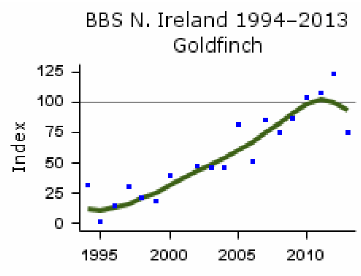
BBS England graph



BBS Scotland graph

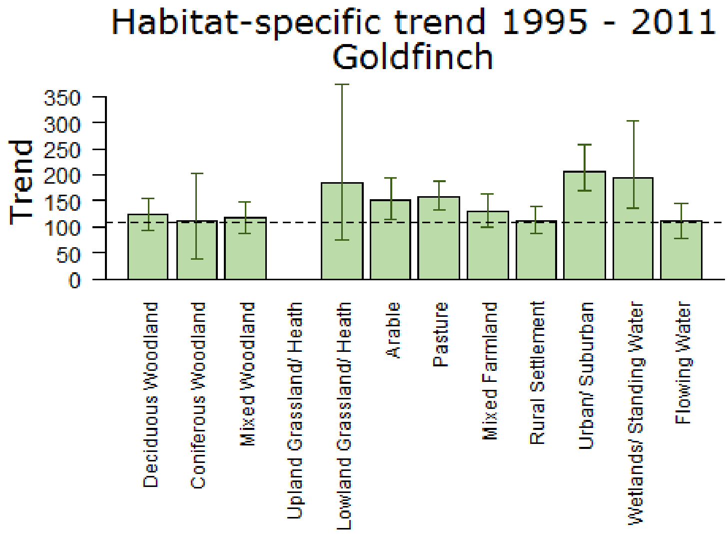


BBS Wales graph



BBS N.Ireland graph

Population trends by habitat



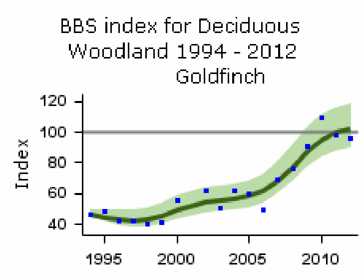
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

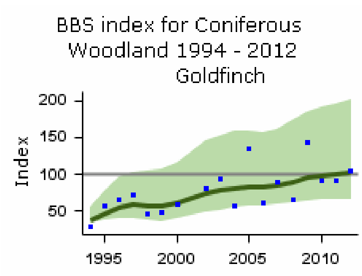
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	218	124	92	153
Coniferous Woodland	16	1995-2011	33	113	40	203
Mixed Woodland	16	1995-2011	95	119	89	150
Lowland Grassland/ Heath	16	1995-2011	41	185	75	373
Arable	16	1995-2011	297	150	114	195
Pasture	16	1995-2011	650	158	133	187
Mixed Farmland	16	1995-2011	297	129	98	164
Rural Settlement	16	1995-2011	491	112	87	139
Urban/ Suburban	16	1995-2011	237	206	170	257
Wetlands/ Standing Water	16	1995-2011	40	193	136	303
Flowing Water	16	1995-2011	186	111	78	147

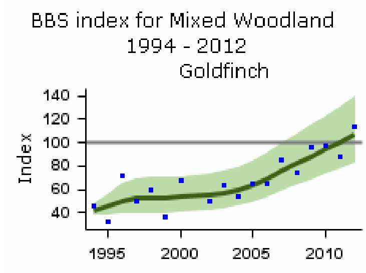
Further information on habitat-specific trends, please follow link here.



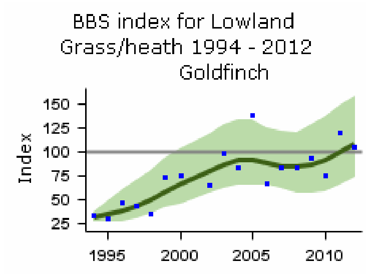
Habitat graph



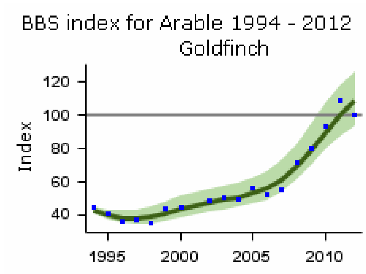
Habitat graph



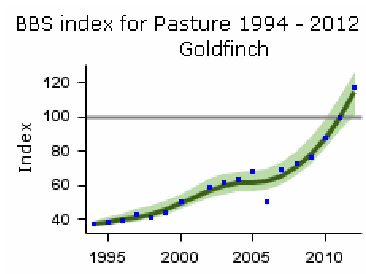
Habitat graph



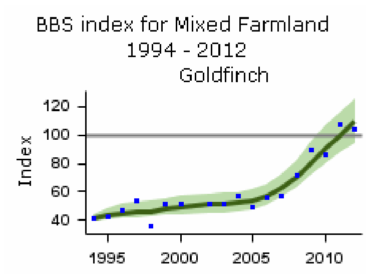
Habitat graph



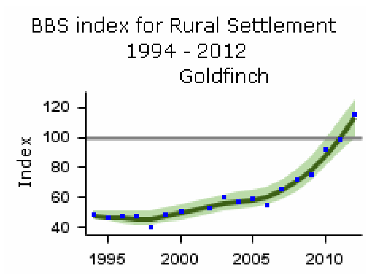
Habitat graph



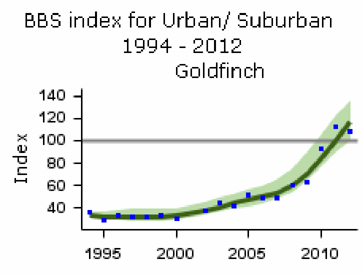
Habitat graph



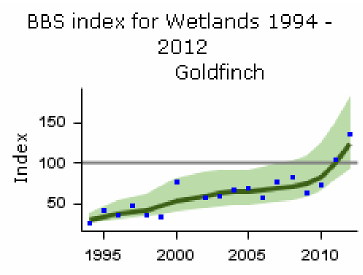
Habitat graph



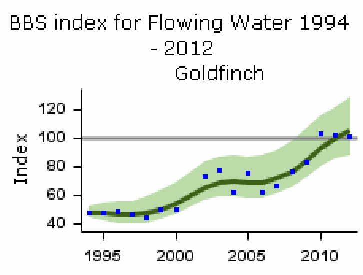
Habitat graph



Habitat graph

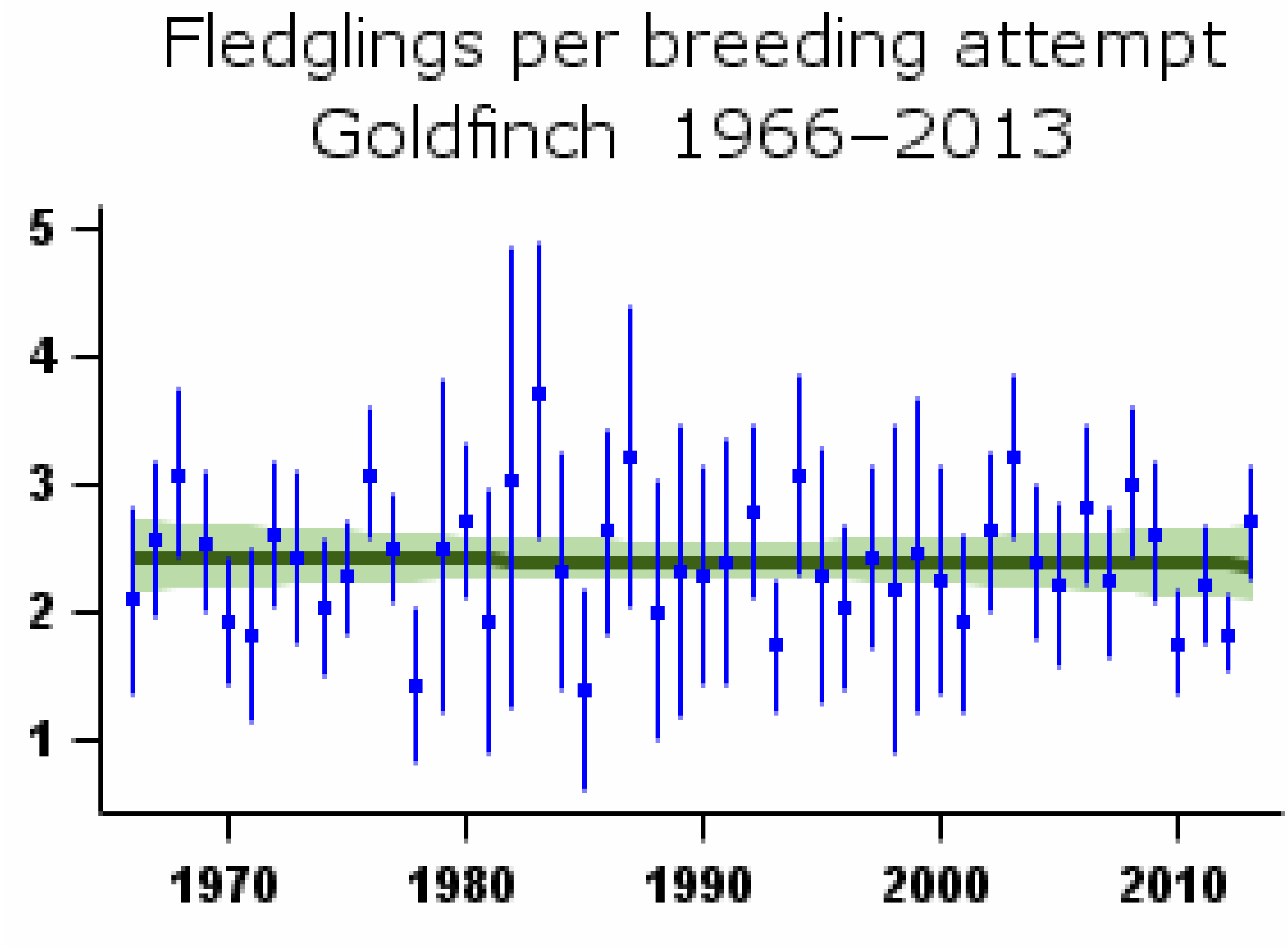


Habitat graph

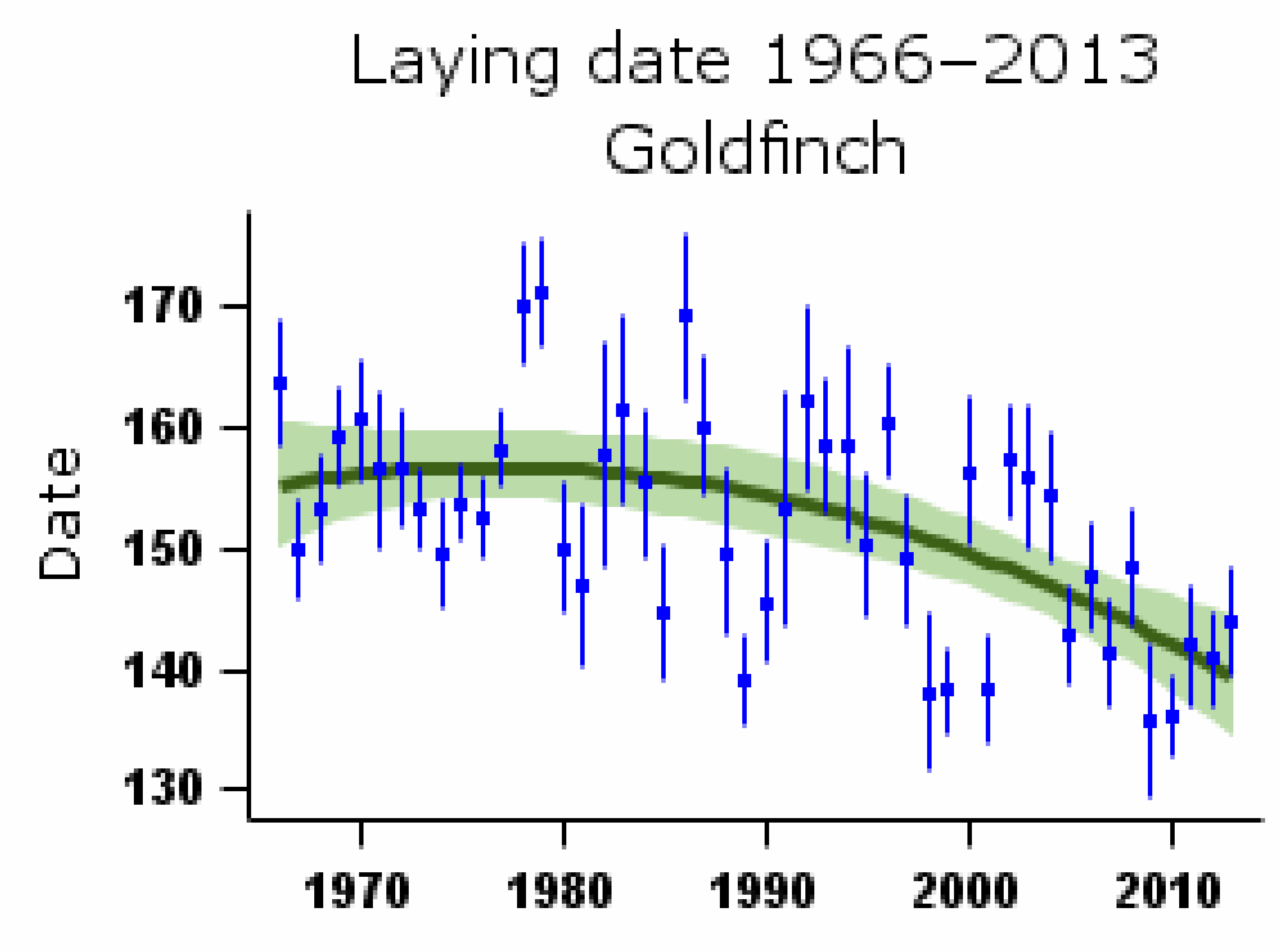


Habitat graph

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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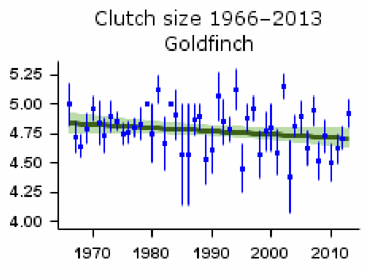
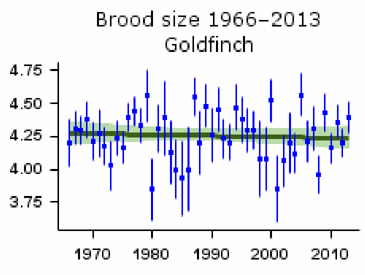
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	30	None					
Clutch size	44	1968-2012	22	None					Small sample
Brood size	44	1968-2012	36	None					
Nest failure rate at egg stage	44	1968-2012	38	Linear increase	1.94% nests/day	2.74% nests/day	41.2%		
Nest failure rate at chick stage	44	1968-2012	30	None					
Laying date	44	1968-2012	24	Curvilinear	Jun 5	May 20	-16 days		Small sample
Juvenile to Adult ratio (CES)	28	1984-2012	37	Smoothed trend	293 Index value	100 Index value	-66%	>50	
Juvenile to Adult ratio (CES)	25	1987-2012	40	Smoothed trend	485 Index value	100 Index value	-79%	>50	
Juvenile to Adult ratio (CES)	10	2002-2012	46	Smoothed trend	165 Index value	100 Index value	-39%	>25	
Juvenile to Adult ratio (CES)	5	2007-2012	47	Smoothed trend	83 Index value	100 Index value	21%		

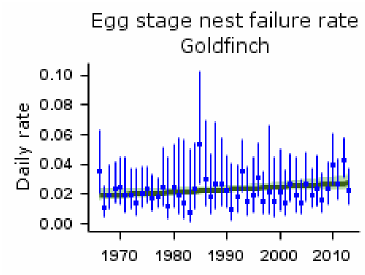
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



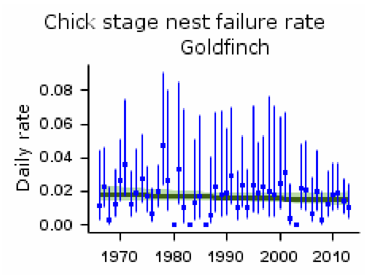
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



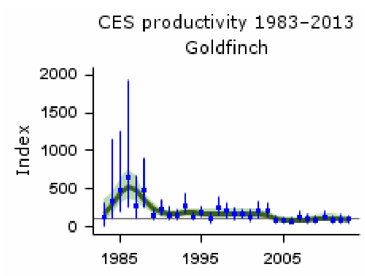
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Siskin

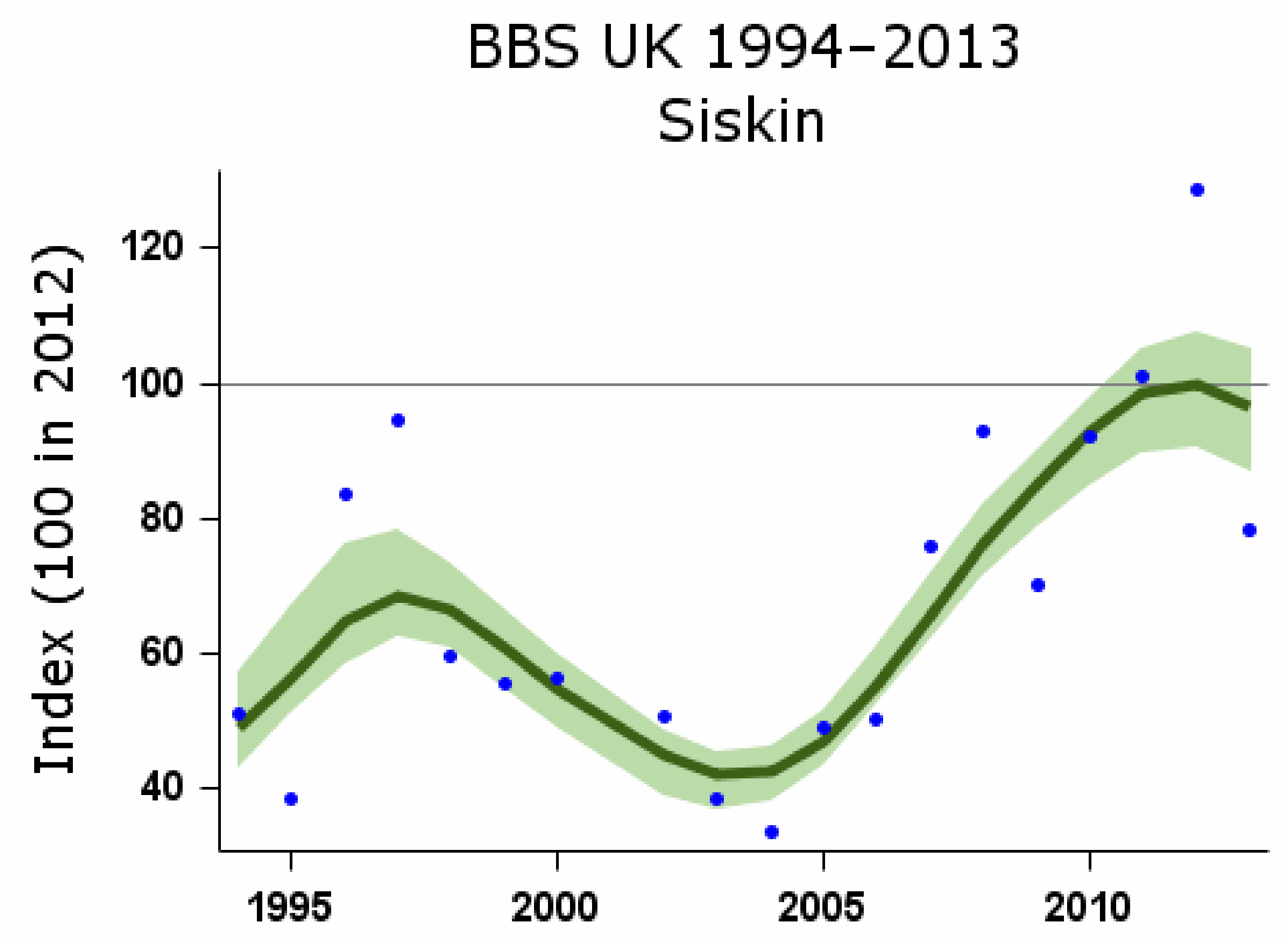
Spinus spinus

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. Their habit of using garden feeders, especially in late winter, has developed since the 1960s and, despite many winter birds in gardens migrating to the Baltic region to breed, may also have helped to boost the UK breeding population. The 1988-91 Breeding Atlas identified a major expansion of the breeding range into southern Britain (Gibbons et al. 1993) and subsequently there have been further considerable range gains, especially in the south and west (Balmeret al. 2013). Progressively more CBC plots became occupied during the 1970s and 1980s (Marchant et al. 1990), but samples were insufficient for annual monitoring until BBS began in 1994. Results since ther show parallel fluctuations of extraordinary amplitude in England and Scotland. To some extent, this may reflect the occasional large continental influxes affecting spring numbers on a broad UK scale. The overall trend across Europe since 1980 has been a moderate decline (PECBMS 2014a).



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

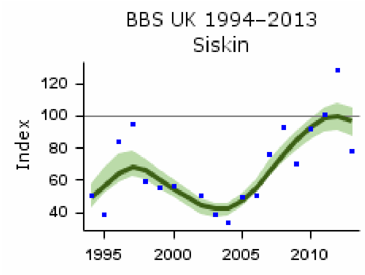
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS UK	17	1995-2012	176	77	36	111		
	10	2002-2012	208	123	93	177		
	5	2007-2012	276	52	33	66		

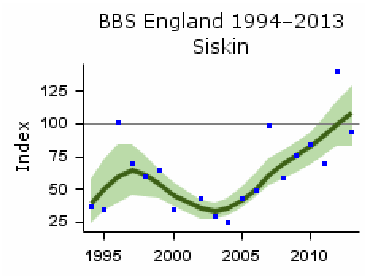
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
BBS England	17	1995-2012	64	101	10	278		
	10	2002-2012	80	161	103	302		
	5	2007-2012	110	63	27	98		
BBS Scotland	17	1995-2012	75	65	20	116		
	10	2002-2012	85	98	56	150		
	5	2007-2012	114	41	18	58		

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

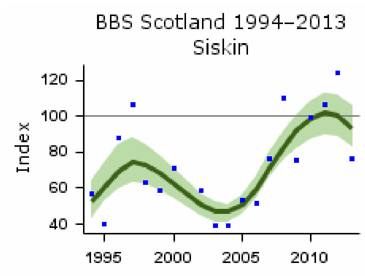
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Yellowhammer

Emberiza citrinella

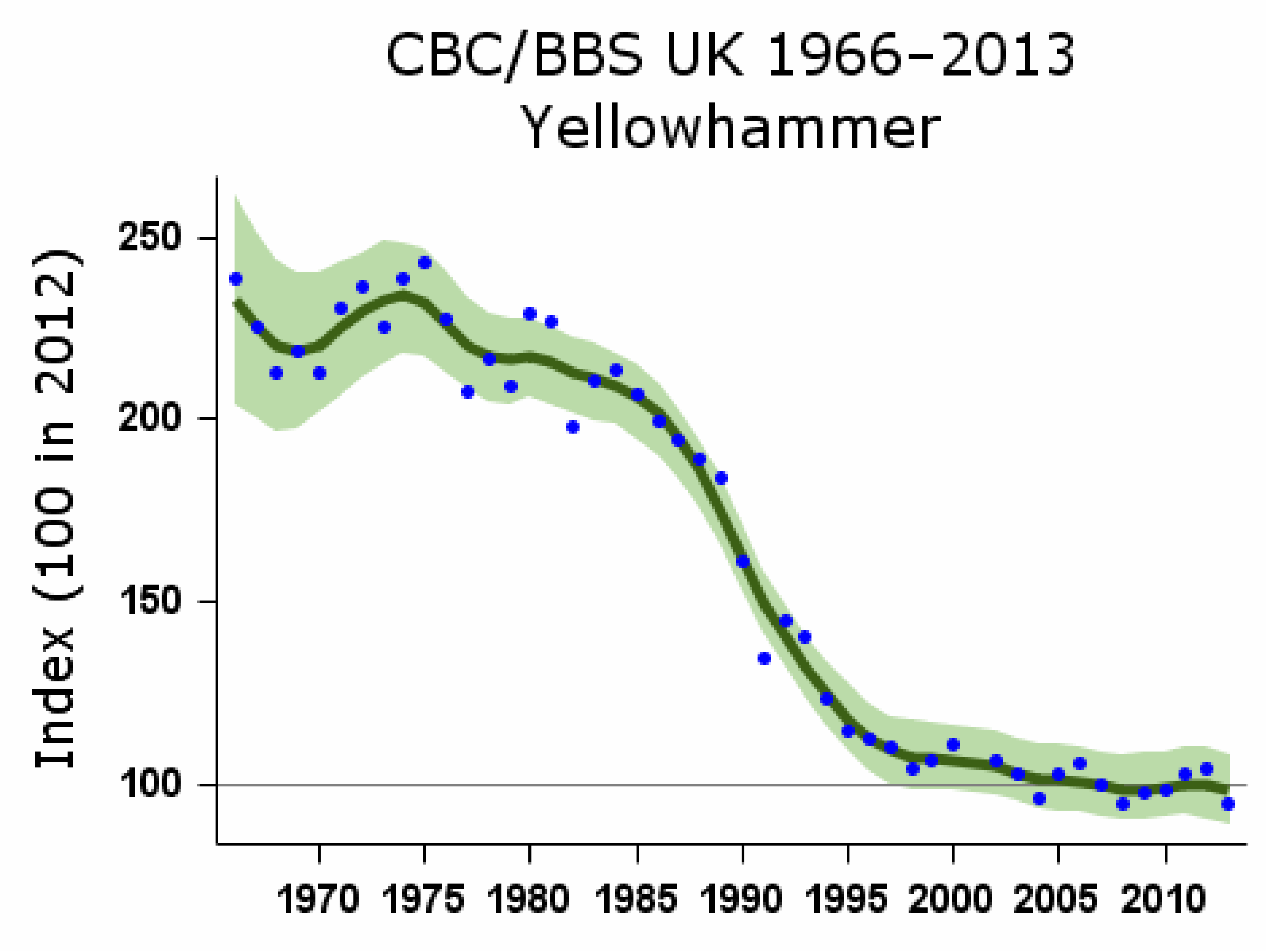
Key facts

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. The downward trend has continued to at least 2009, although with substantial increase in Scotland since 2003. The BBS Balmer et al. 2013). The species, listed as green in 1996, has been red listed since 2002. Numbers have shown widespread moderate decrease across Europe since 1980 (PECBMS 2014a).



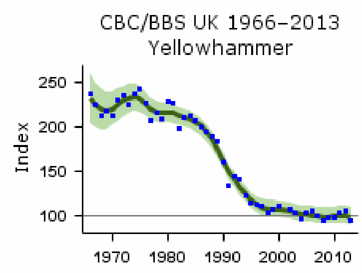
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

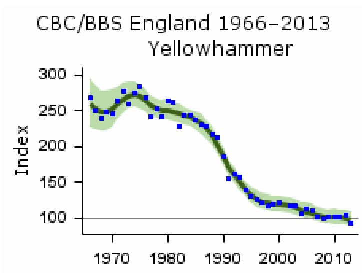
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	45	1967-2012	568	-56	-64	-43	>50	
	25	1987-2012	905	-49	-55	-42	>25	
	10	2002-2012	1272	-5	-10	0		
	5	2007-2012	1387	0	-5	4		
CBC/BBS England	45	1967-2012	496	-60	-68	-49	>50	
	25	1987-2012	790	-56	-61	-50	>50	
	10	2002-2012	1111	-14	-19	-11		
	5	2007-2012	1207	-4	-8	-1		
BBS UK	17	1995-2012	1195	-14	-19	-8		
	10	2002-2012	1272	-4	-10	0		
	5	2007-2012	1387	0	-4	4		
BBS England	17	1995-2012	1041	-24	-28	-20		
	10	2002-2012	1111	-14	-18	-10		
	5	2007-2012	1207	-5	-7	-1		
BBS Scotland	17	1995-2012	109	35	15	57		
	10	2002-2012	118	40	22	57		
	5	2007-2012	139	19	3	31		
BBS Wales	17	1995-2012	34	-59	-68	-43	>50	
	10	2002-2012	32	-44	-55	-26	>25	

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

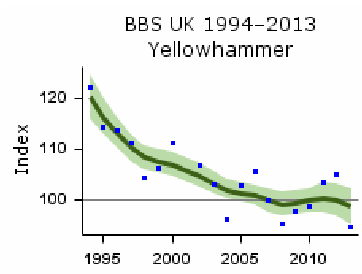
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



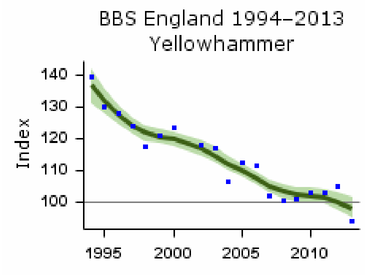
CBC/BBS UK graph



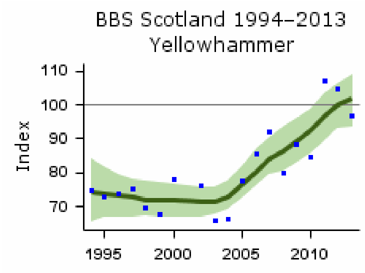
CBC/BBS England graph



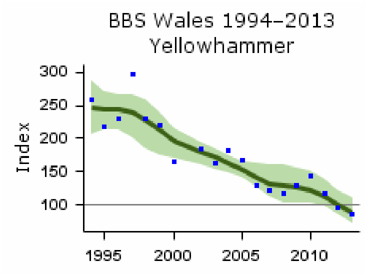
BBS UK graph



BBS England graph

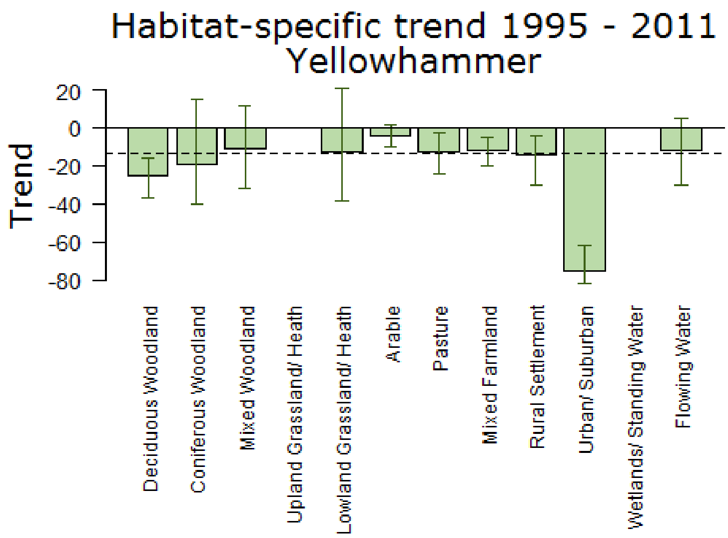


BBS Scotland graph



BBS Wales graph

Population trends by habitat



Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

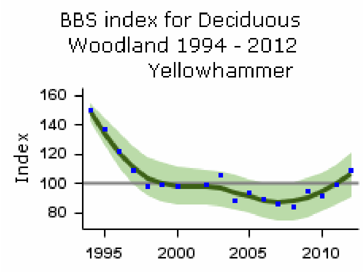
Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

More on habitat trends

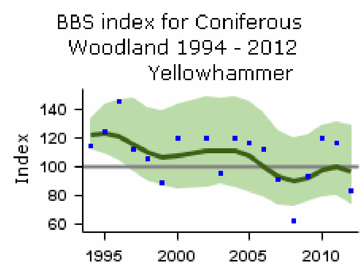
Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	240	-25	-37	-16

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Coniferous Woodland	16	1995-2011	43	-19	-40	15
Mixed Woodland	16	1995-2011	105	-11	-32	11
Lowland Grassland/ Heath	16	1995-2011	53	-12	-39	21
Arable	16	1995-2011	553	-4	-10	2
Pasture	16	1995-2011	564	-13	-24	-3
Mixed Farmland	16	1995-2011	445	-12	-20	-5
Rural Settlement	16	1995-2011	277	-15	-30	-4
Urban/ Suburban	16	1995-2011	31	-75	-82	-62
Flowing Water	16	1995-2011	139	-12	-31	5

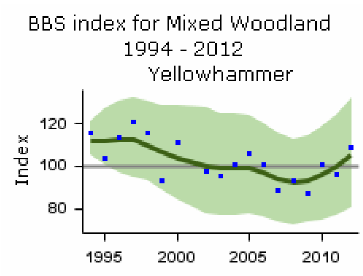
Further information on habitat-specific trends, please follow link here.



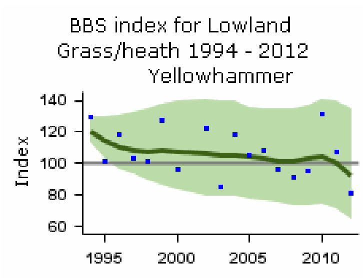
Habitat graph



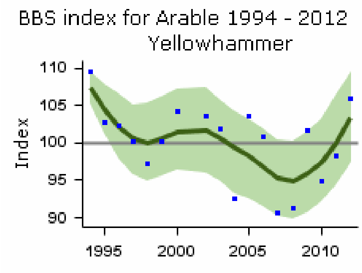
Habitat graph



Habitat graph



Habitat graph



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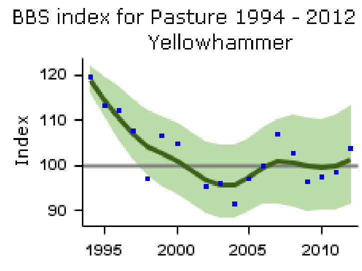

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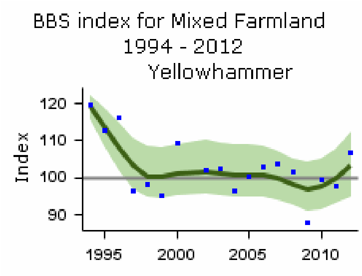

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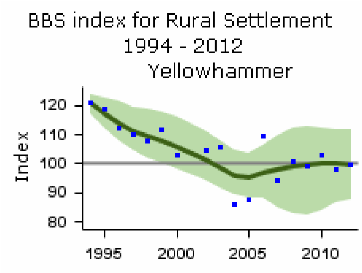
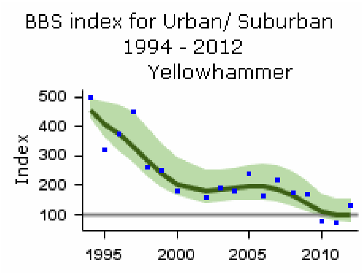
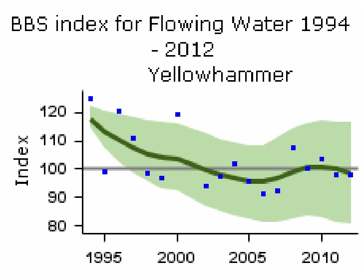


Habitat graph

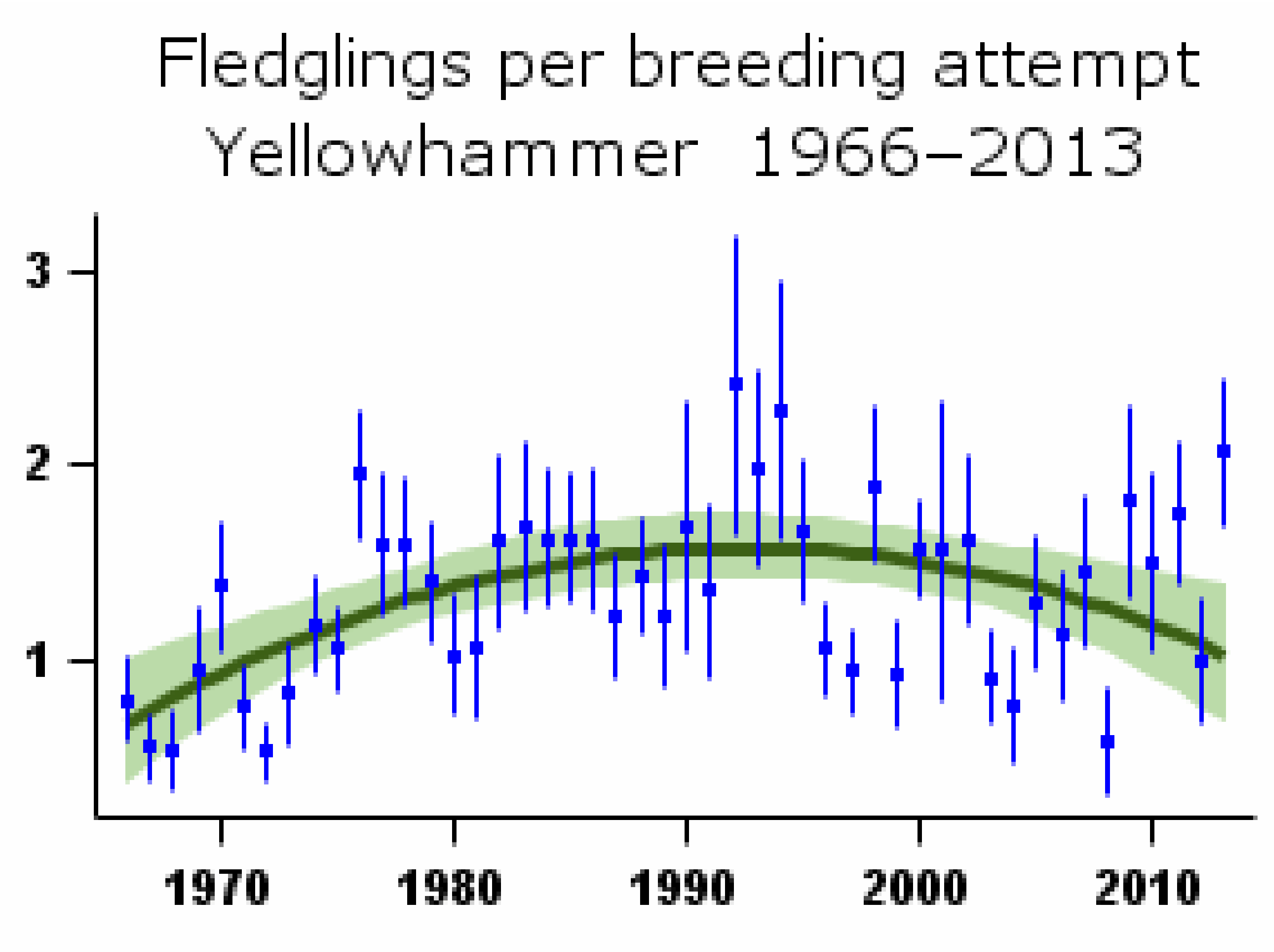


Habitat graph

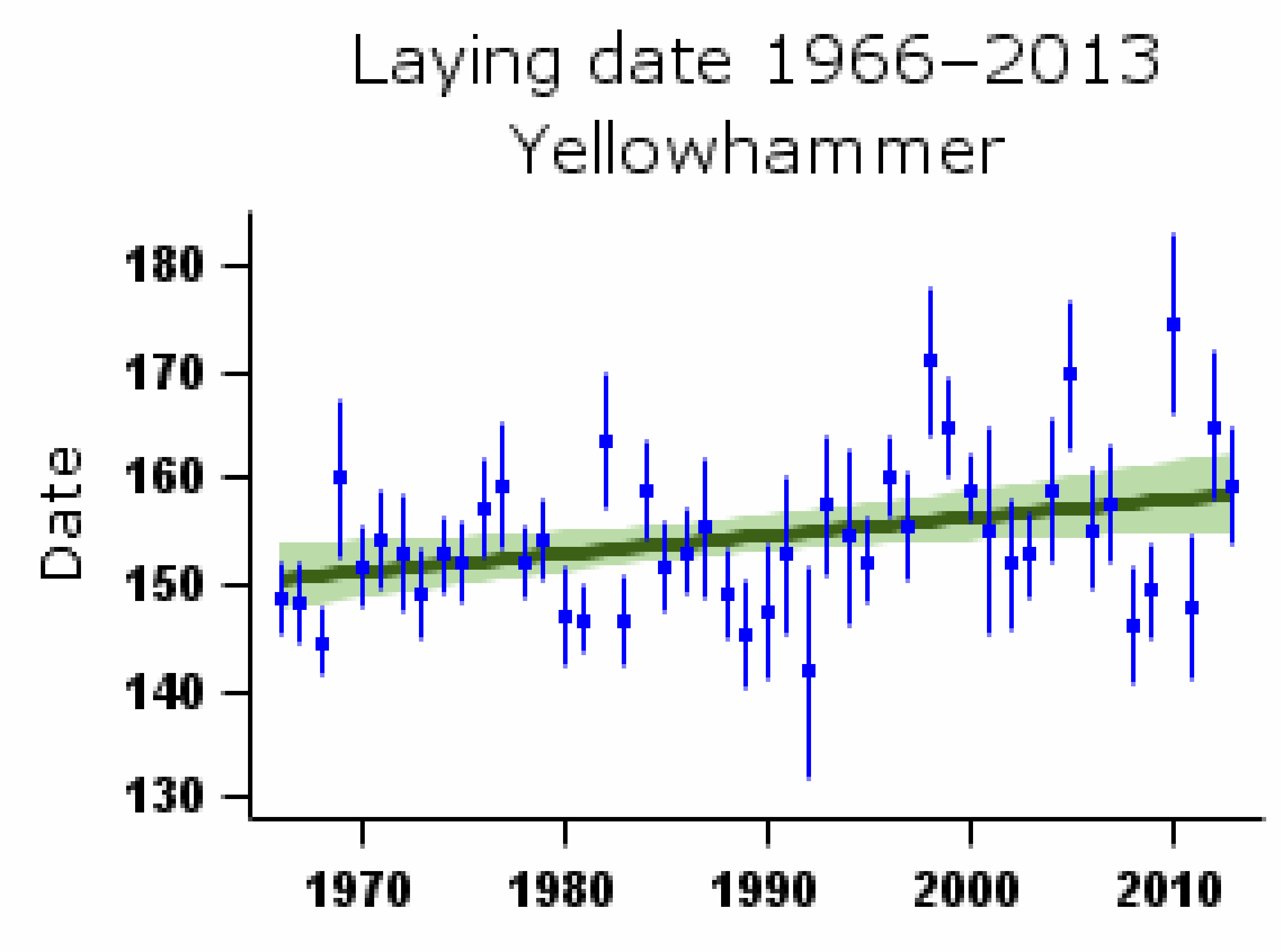


Habitat graph

Demographic trends



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

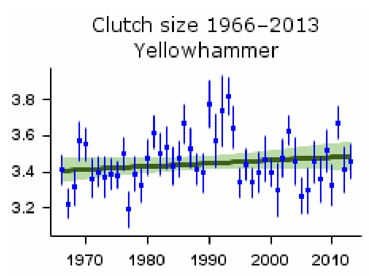


Mean laying date in Julian days (1st April = Day 90) - green bars represent standard error and black line shows long-term trend

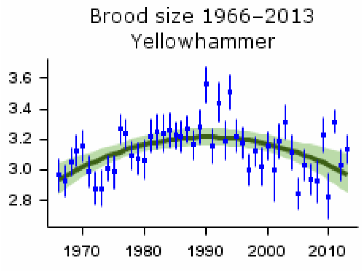
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	49	Curvilinear	0.82 fledglings	1.09 fledglings	33.0%		
Clutch size	44	1968-2012	43	None					
Brood size	44	1968-2012	66	Curvilinear	2.98 chicks	2.99 chicks	0.4%		
Nest failure rate at egg stage	44	1968-2012	63	Curvilinear	4.94% nests/day	3.40% nests/day	-31.2%		
Nest failure rate at chick stage	44	1968-2012	50	Curvilinear	4.32% nests/day	3.85% nests/day	-10.9%		
Laying date	44	1968-2012	26	Linear increase	May 31	Jun 7	7 days		Small sample

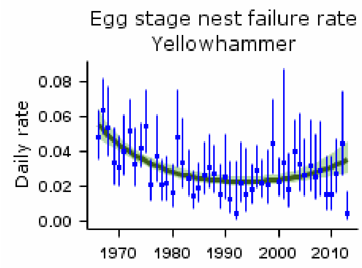
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



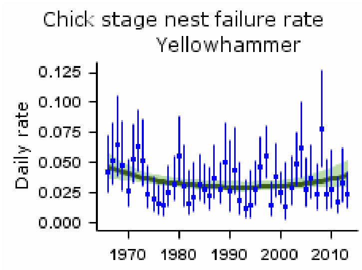
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



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

Causes of change

Declines in annual survival have been proposed as the demographic mechanism for decline, due to winter resource limitation, although ring-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 no 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, declines in clutch size, brood size and nest success were formerly of NRS concern (Leech & Barimore 2008).

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., Sullivan, M.J.P., Eglington, S.M., Barimore, C., Dadam, D., Downie, I.S., Harris, S.J., Kew, A.J., Newson, S.E., Noble, D.G., Risely, K. & Robinson, R.A. (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford. https://www.bto.org/birdtrends

Reed Bunting

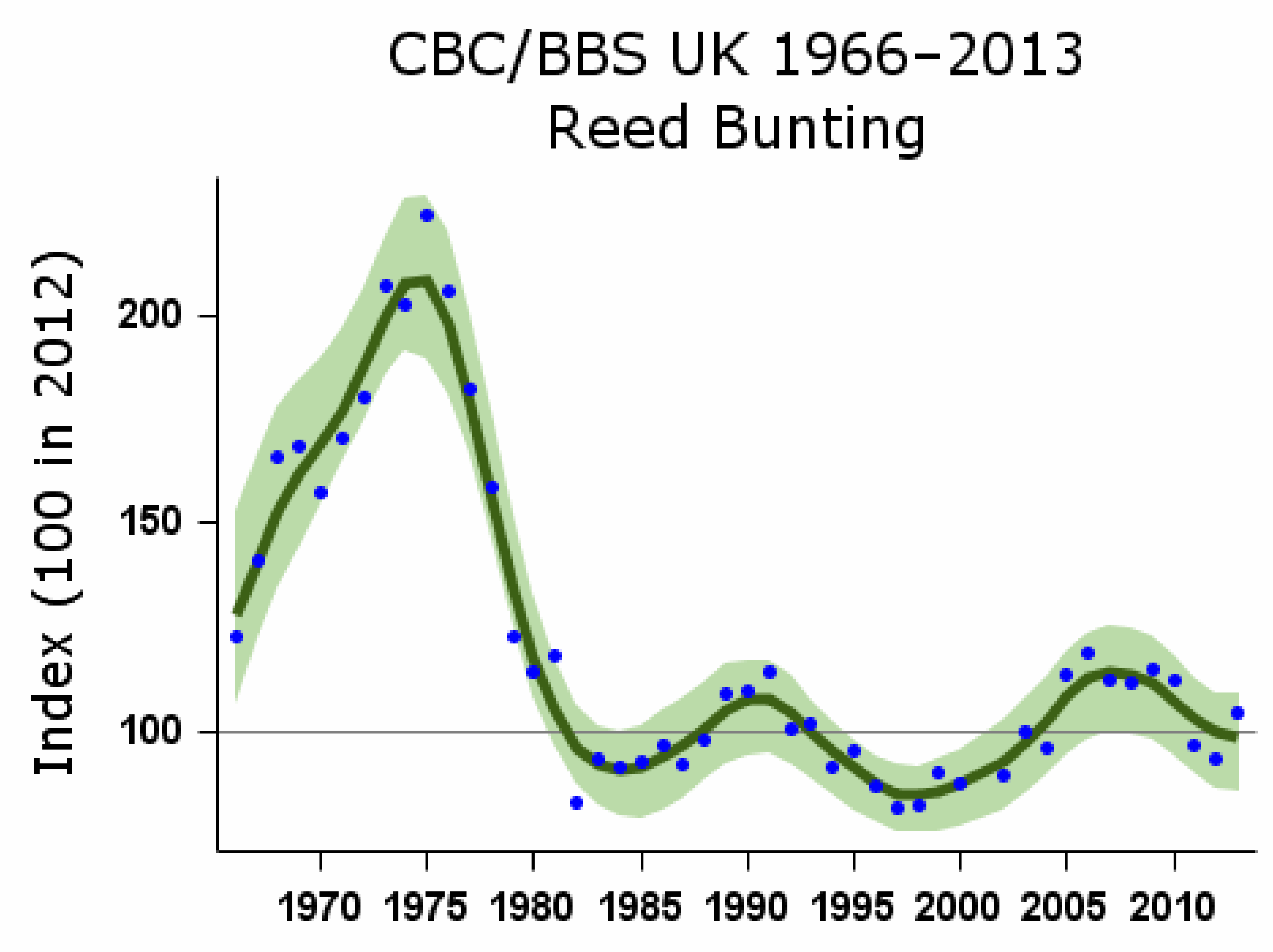
Emberiza schoeniclus

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: priority species
Long-term trend:	UK: moderate decline 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, after an earlier increase, but Reed Bunting abundance has fluctuated without a clear trend since the 1980s. Since 1994, results from BBS indicate significant population increase, though with a downturn in the last few seasons. 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). 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 a widespread moderate decline across Europe since 1980 (PECBMS 2014a).



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

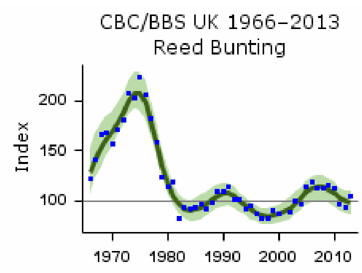
Population changes in detail

Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	45	1967-2012	258	-29	-49	-9	>25	
	25	1987-2012	384	3	-15	25		
	10	2002-2012	586	8	-1	19		

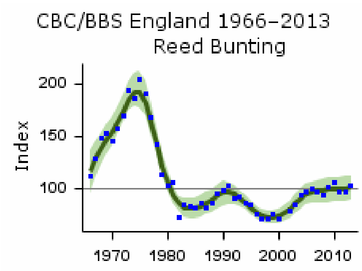
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS England	45	1967-2012	202	-22	-40	3		
	25	1987-2012	294	17	-3	44		
	10	2002-2012	443	25	15	36		
	5	2007-2012	512	2	-3	8		
WBS/WBBS waterways	37	1975-2012	86	-62	-73	-46	>50	
	25	1987-2012	104	-9	-29	21		
	10	2002-2012	142	1	-9	15		
	5	2007-2012	127	-9	-16	2		
CES adults	28	1984-2012	59	-64	-73	-49	>50	
	25	1987-2012	63	-59	-70	-43	>50	
	10	2002-2012	64	-28	-43	-12	>25	
	5	2007-2012	64	-20	-30	-8		
CES juveniles	28	1984-2012	44	86	-31	331		
	25	1987-2012	47	-29	-57	14		
	10	2002-2012	48	-30	-52	12		
	5	2007-2012	48	2	-22	31		
BBS UK	17	1995-2012	501	14	2	29		
	10	2002-2012	586	8	-3	22		
	5	2007-2012	670	-11	-19	-3		
BBS England	17	1995-2012	379	24	10	40		
	10	2002-2012	443	24	15	37		
	5	2007-2012	512	2	-3	8		
BBS Scotland	17	1995-2012	61	1	-33	36		
	10	2002-2012	71	-18	-39	8		
	5	2007-2012	84	-37	-53	-15	>25	
BBS N.Ireland	17	1995-2012	33	-19	-48	31		
	10	2002-2012	38	-18	-43	9		
	5	2007-2012	39	-24	-39	-11		

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

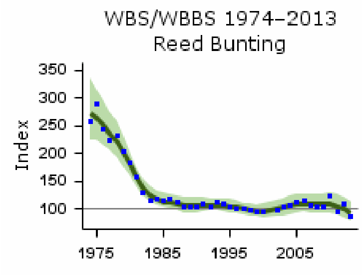
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



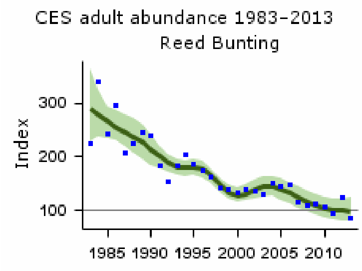
CBC/BBS UK graph



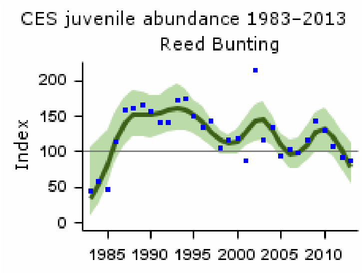
CBC/BBS England graph



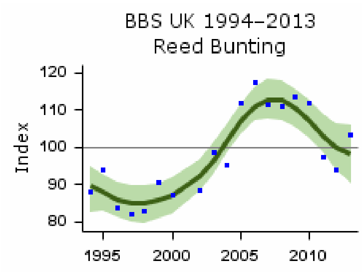
WBS/WBBS waterways graph



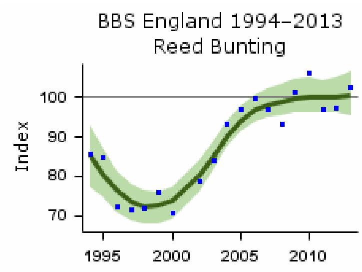
CES adults graph



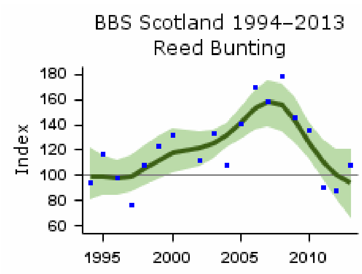
CES juveniles graph



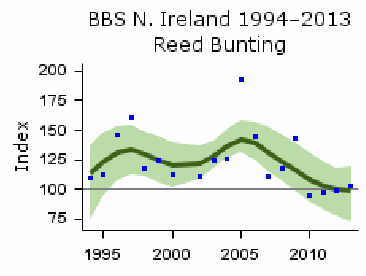
BBS UK graph



BBS England graph

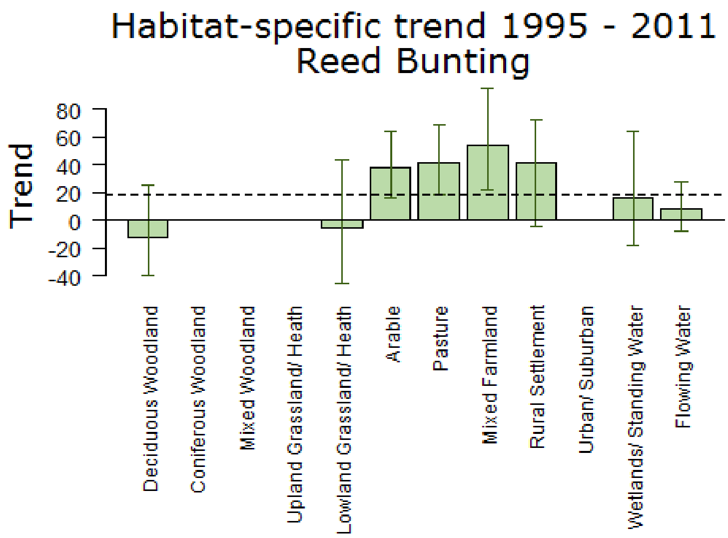


BBS Scotland graph



BBS N.Ireland graph

Population trends by habitat



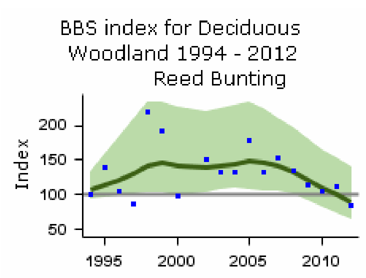
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

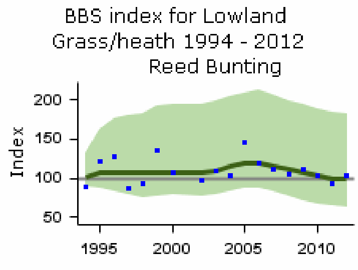
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Deciduous Woodland	16	1995-2011	43	-12	-40	26
Lowland Grassland/ Heath	16	1995-2011	40	-6	-45	44
Arable	16	1995-2011	126	38	17	64
Pasture	16	1995-2011	177	42	19	69
Mixed Farmland	16	1995-2011	69	55	22	95
Rural Settlement	16	1995-2011	46	42	-4	72
Wetlands/ Standing Water	16	1995-2011	48	16	-18	65
Flowing Water	16	1995-2011	121	8	-8	28

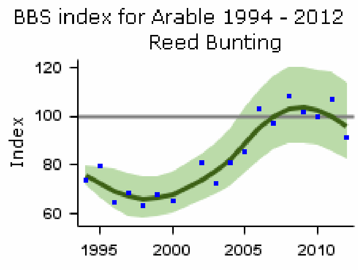
Further information on habitat-specific trends, please follow link here.



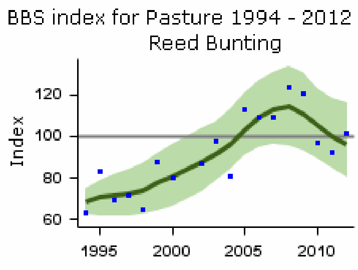
Habitat graph



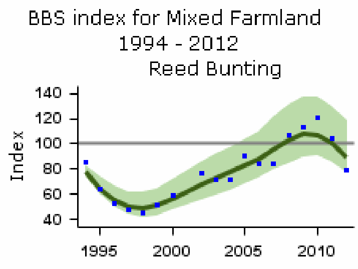
Habitat graph



Habitat graph



Habitat graph



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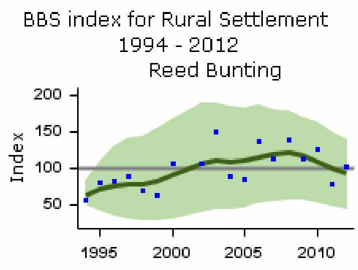
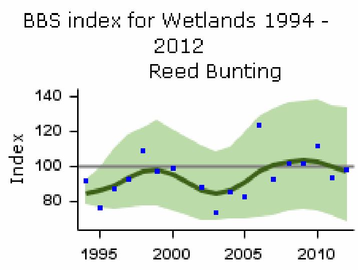
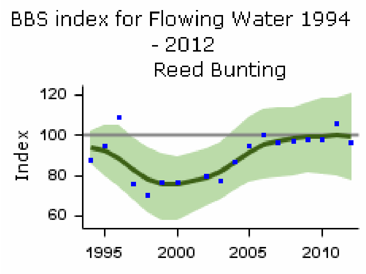


Habitat graph

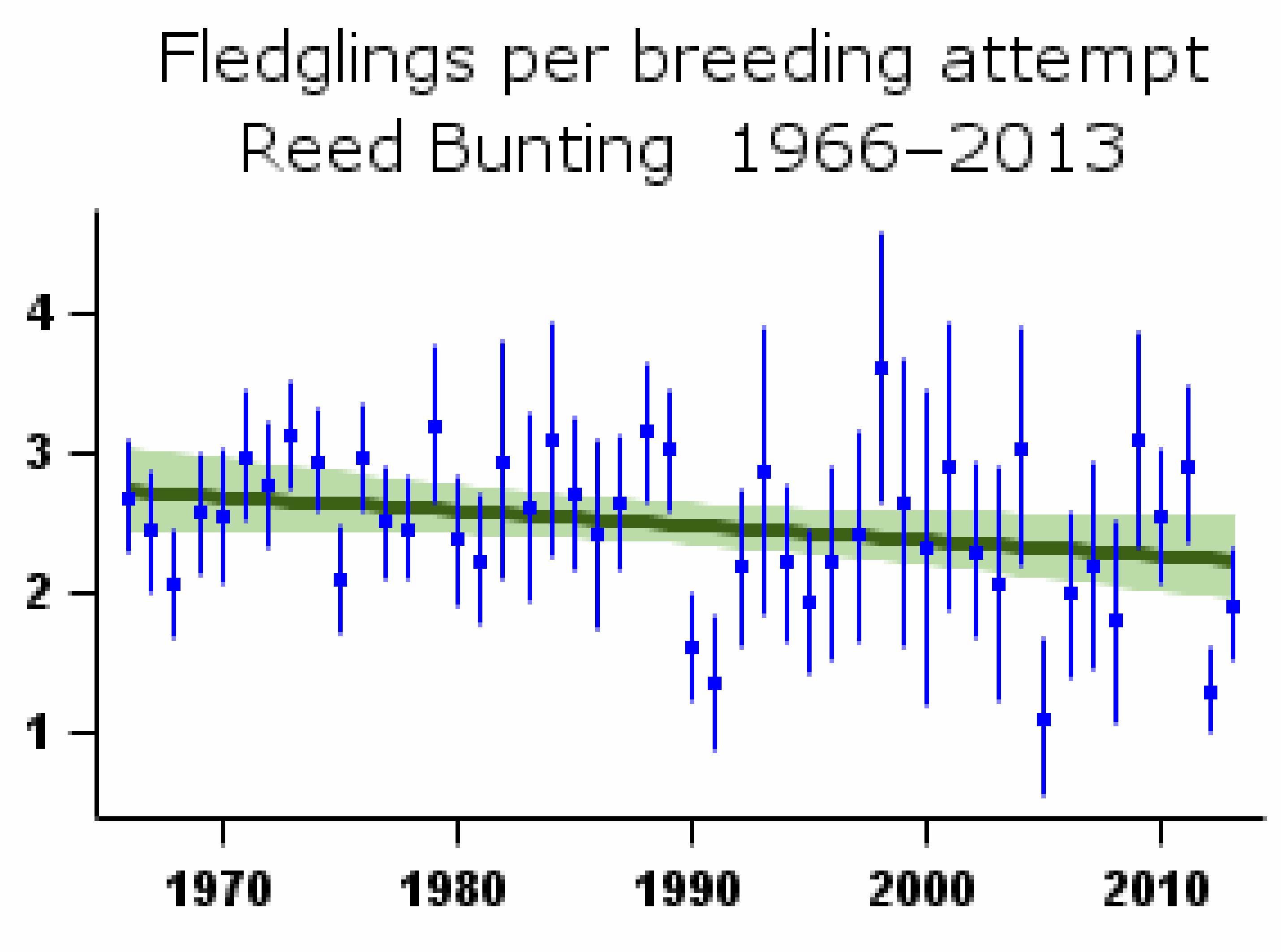


Habitat graph

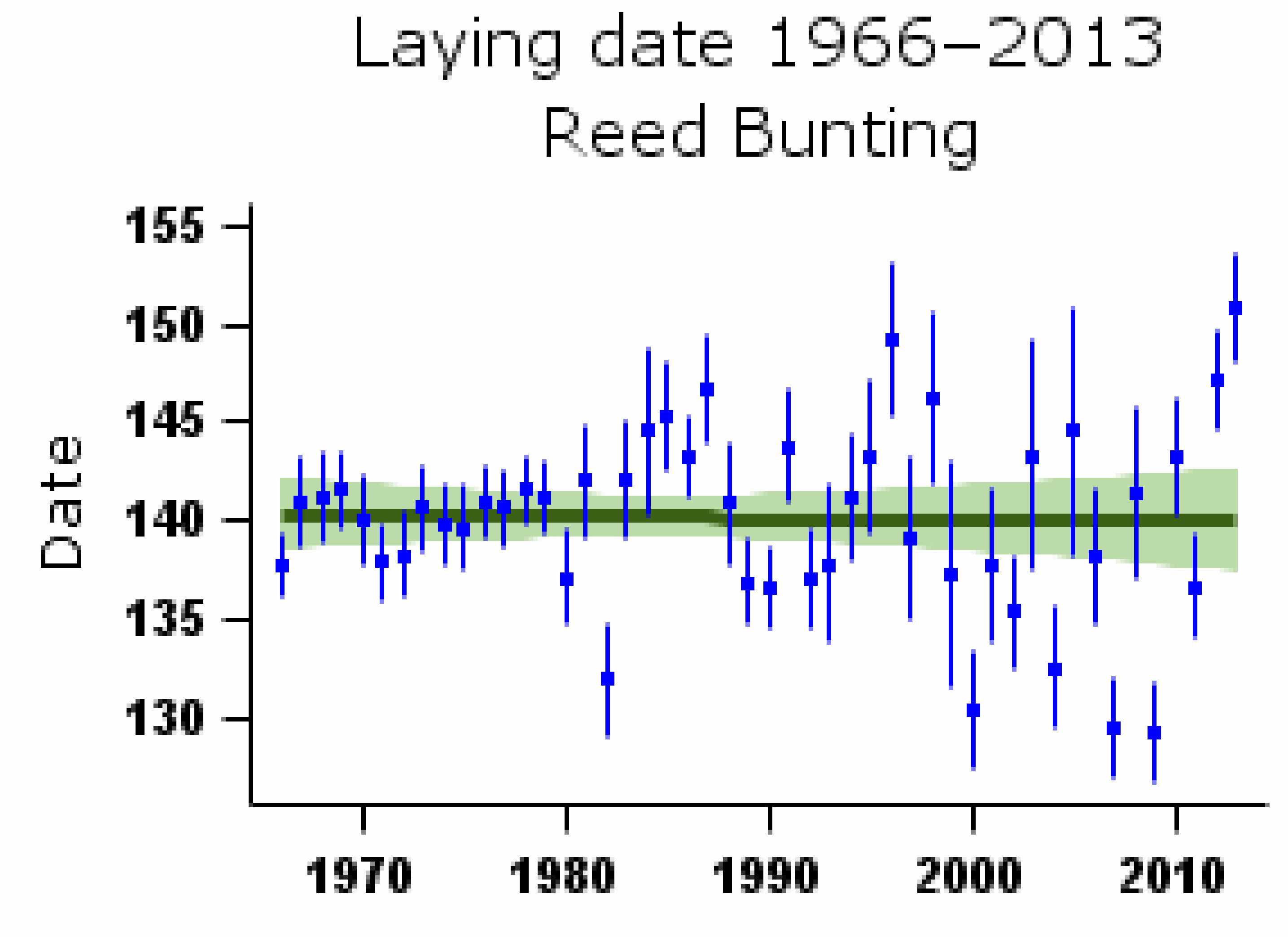


Habitat graph

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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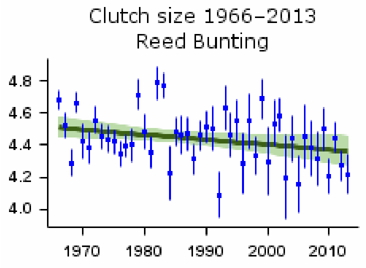
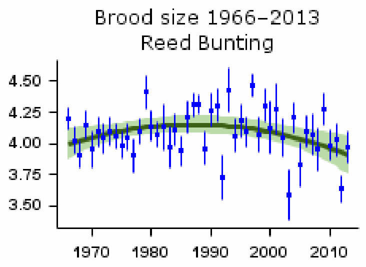
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	47	None					
Clutch size	44	1968-2012	44	Linear decline	4.50 eggs	4.37 eggs	-3.0%		
Brood size	44	1968-2012	61	Curvilinear	4.02 chicks	3.92 chicks	-2.4%		
Nest failure rate at egg stage	44	1968-2012	51	Linear increase	0.79% nests/day	2.37% nests/day	200.0%		
Nest failure rate at chick stage	44	1968-2012	51	None					
Laying date	44	1968-2012	48	None			0 days		
Juvenile to Adult ratio (CES)	28	1984-2012	62	Smoothed trend	207 Index value	100 Index value	-52%	>50	
Juvenile to Adult ratio (CES)	25	1987-2012	66	Smoothed trend	287 Index value	100 Index value	-65%	>50	
Juvenile to Adult ratio (CES)	10	2002-2012	68	Smoothed trend	139 Index value	100 Index value	-28%		
Juvenile to Adult ratio (CES)	5	2007-2012	68	Smoothed trend	94 Index value	100 Index value	6%		

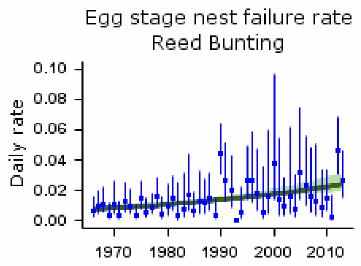
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



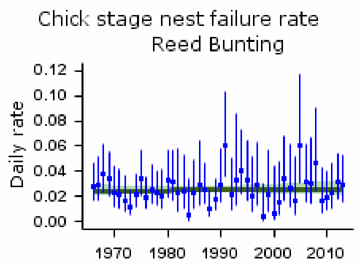
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



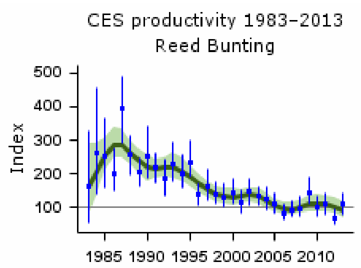
Mean number of chicks per nest - green bars represent standard error and black line shows long-term trend



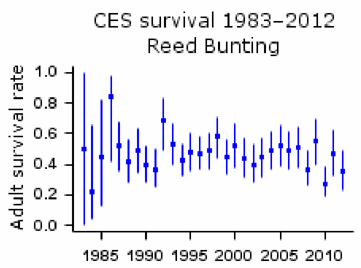
Proportion of nests failing per day during incubation - green bars represent 95% confidence limits and black line shows long-term trend



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

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Corn Bunting

Emberiza calandra

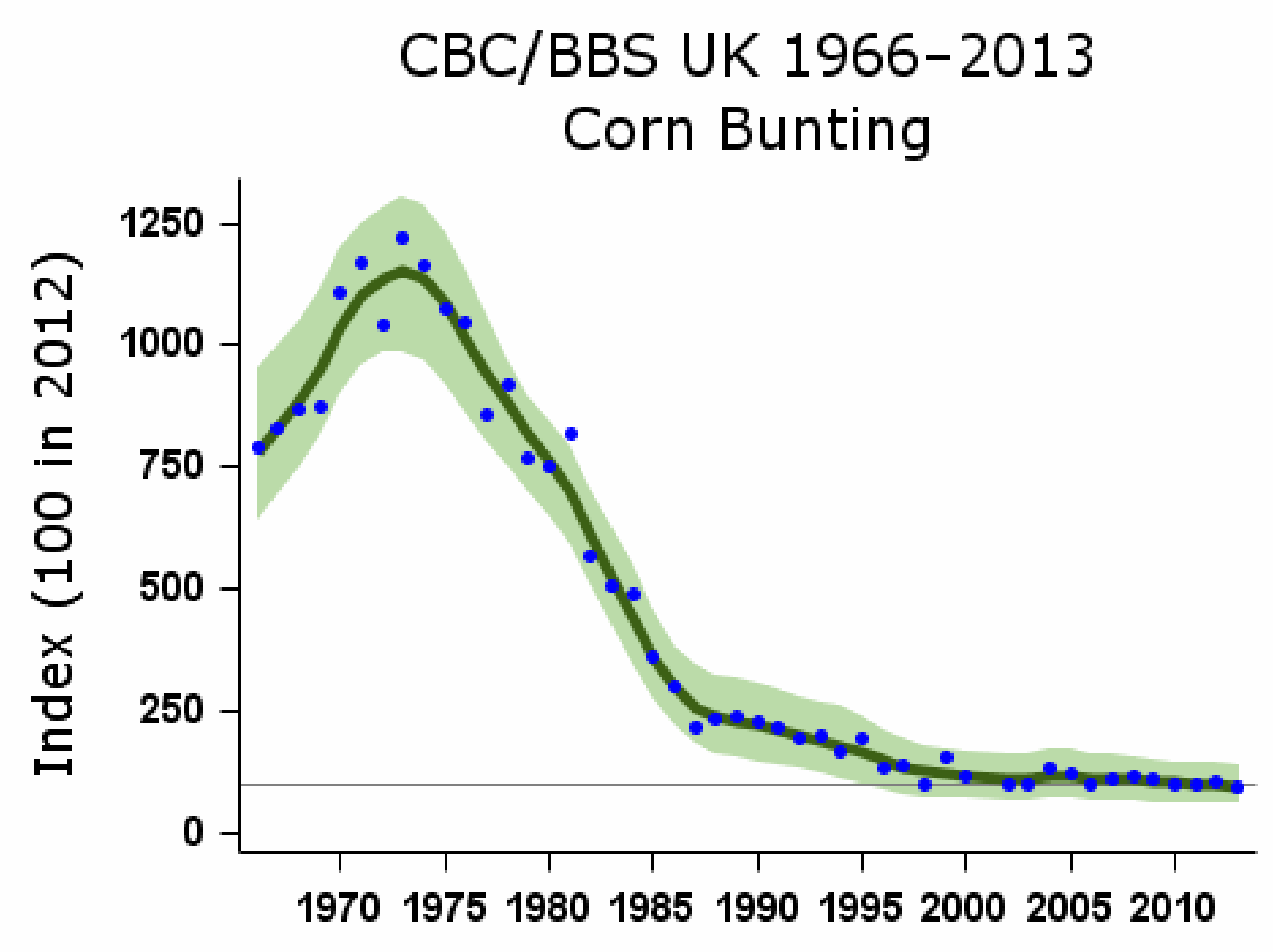
Key facts

Conservation listings:	Europe: SPEC category 2 (declining) (BiE04) UK: red (>50% population decline, historical decline) (BoCC3) UK Biodiversity Action Plan: 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, though with no detectable change since 1990 (PECBMS 2014a), 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).



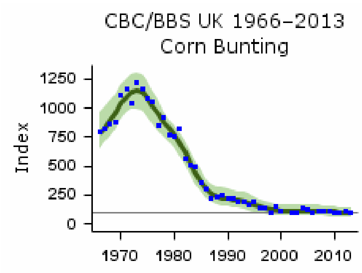
Smoothed population index, relative to an arbitrary 100 in the year given, with 85% confidence limits in green

Population changes in detail

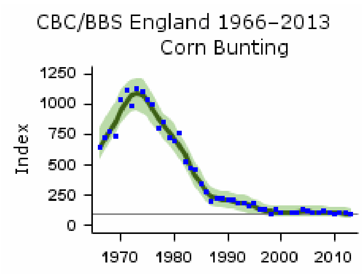
Source	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit	Alert	Comment
CBC/BBS UK	45	1967-2012	75	-88	-94	-79	>50	
	25	1987-2012	111	-61	-78	-38	>50	Small CBC sample
	10	2002-2012	140	-10	-29	13		
	5	2007-2012	151	-11	-22	2		
CBC/BBS England	45	1967-2012	72	-86	-93	-76	>50	
	25	1987-2012	107	-59	-77	-35	>50	Small CBC sample
	10	2002-2012	134	-6	-26	16		
	5	2007-2012	144	-10	-26	4		
BBS UK	17	1995-2012	143	-39	-50	-25	>25	
	10	2002-2012	140	-11	-27	7		
	5	2007-2012	151	-11	-22	2		
BBS England	17	1995-2012	137	-35	-48	-22	>25	
	10	2002-2012	134	-7	-23	17		
	5	2007-2012	144	-11	-21	7		

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

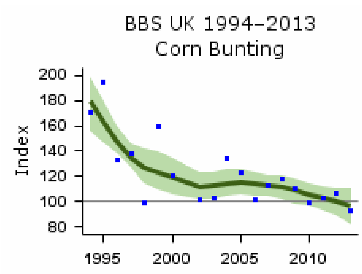
The Breeding Bird Survey is jointly funded by the BTO, JNCC & RSPB



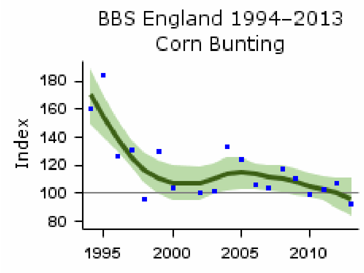
CBC/BBS UK graph



CBC/BBS England graph

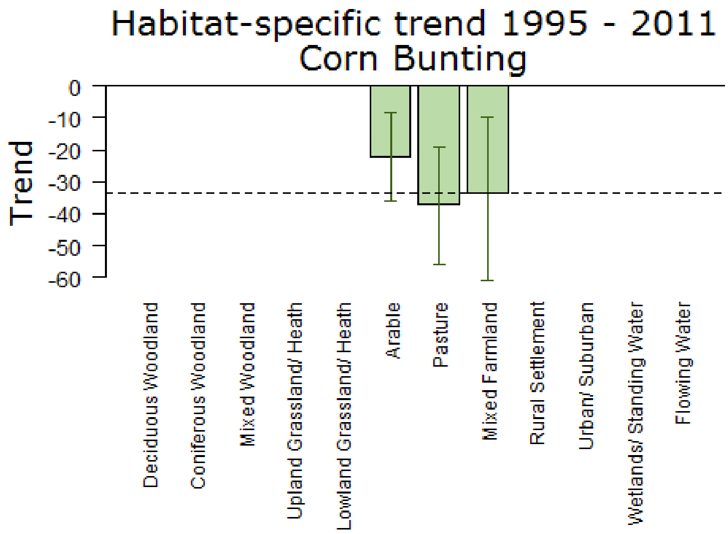


BBS UK graph



BBS England graph

Population trends by habitat



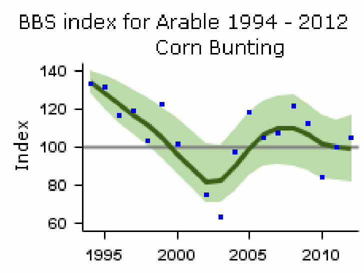
Population trend, with error bars showing 95% confidence intervals. The dashed line shows the national BBS trend over the same period.

Note that habitat trend graphs are not updated every year. Trends are not reported here or in more detail for habitats where the species was recorded in fewer than 30 plots per year.

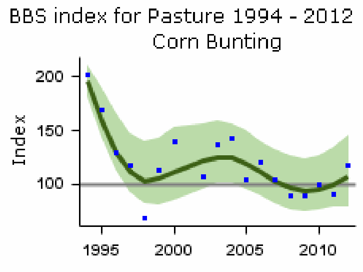
More on habitat trends

Habitat	Period (yrs)	Years	Plots (n)	Change (%)	Lower limit	Upper limit
Arable	16	1995-2011	85	-22	-36	-9
Pasture	16	1995-2011	42	-37	-56	-19
Mixed Farmland	16	1995-2011	37	-34	-61	-10

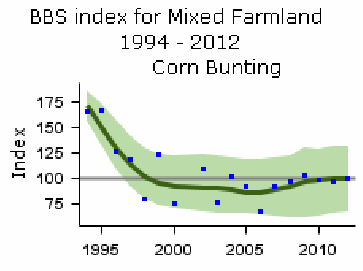
Further information on habitat-specific trends, please follow link here.



Habitat graph

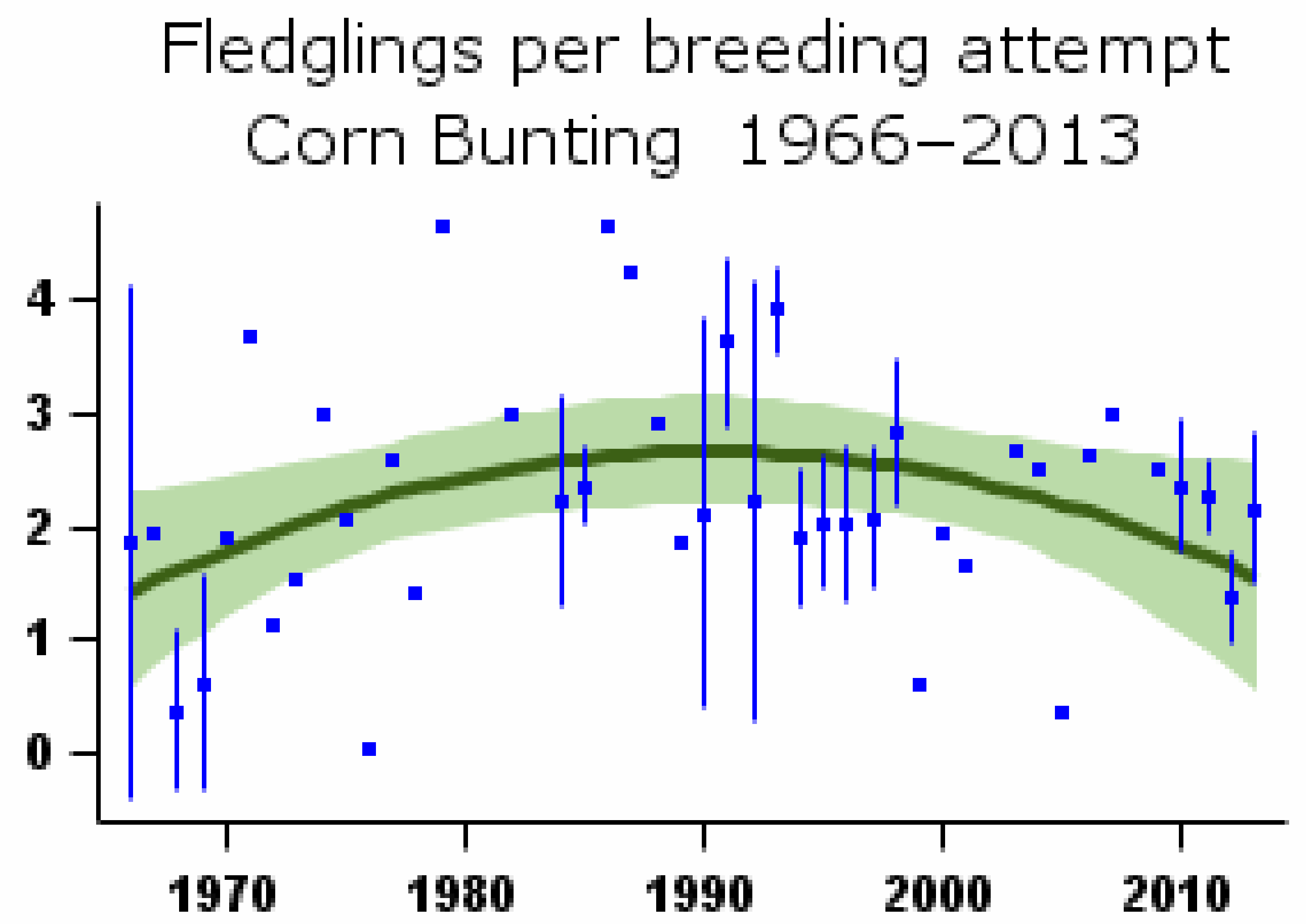


Habitat graph

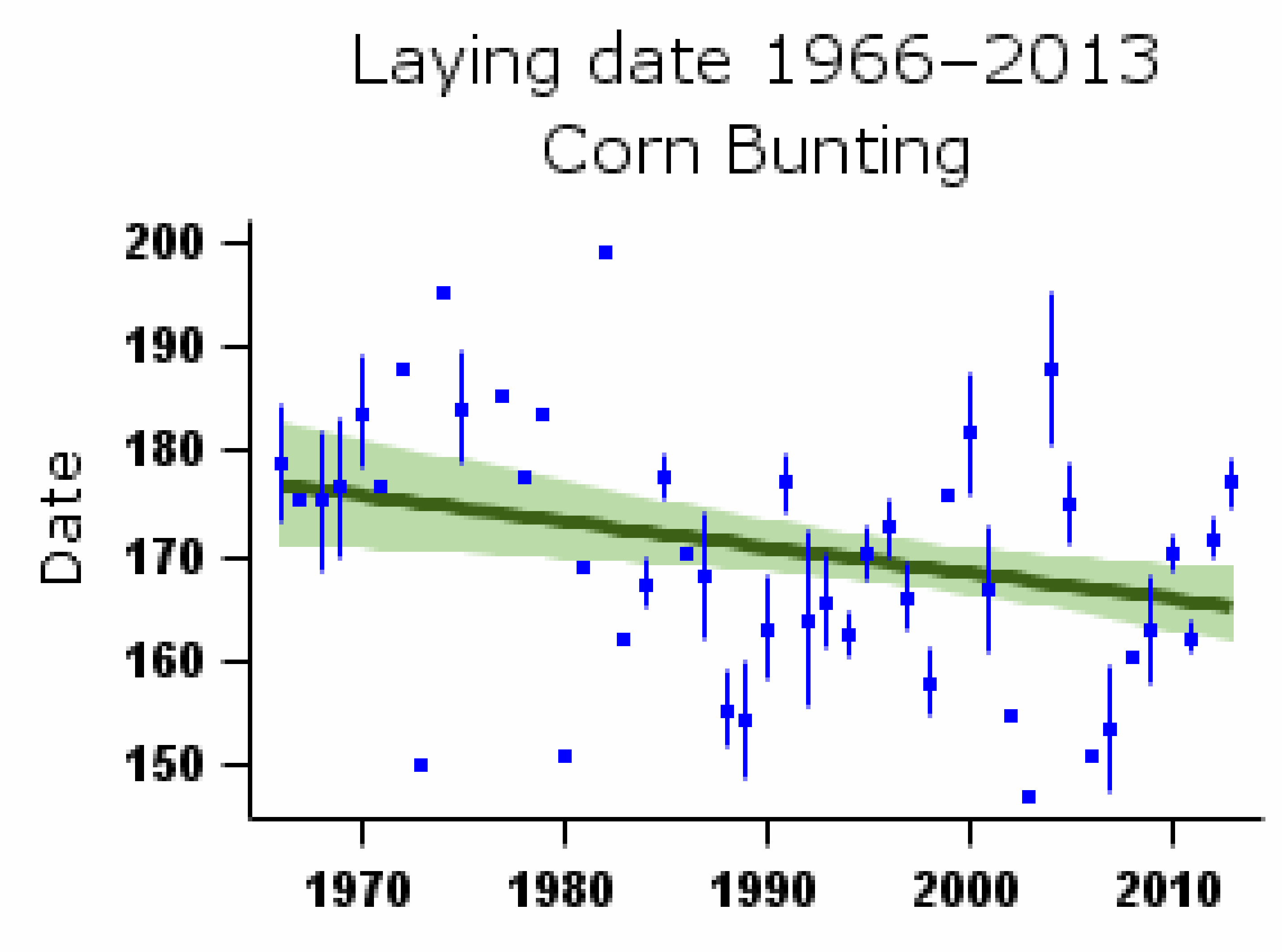


Habitat graph

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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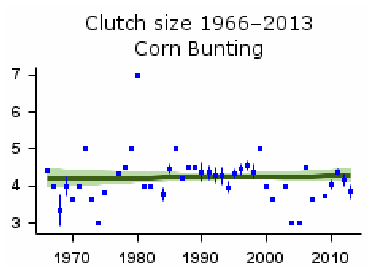
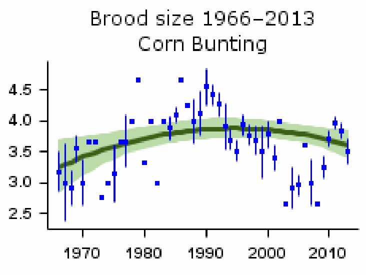
More on demographic trends

Variable	Period (yrs)	Years	Mean annual sample	Trend	Modelled in first year	Modelled in 2012	Change	Alert	Comment
Fledglings per breeding attempt	44	1968-2012	11	Curvilinear	1.61 fledglings	1.64 fledglings	1.7%		
Clutch size	44	1968-2012	10	None					Small sample
Brood size	44	1968-2012	15	Curvilinear	3.34 chicks	3.64 chicks	9.1%		Small sample
Nest failure rate at egg stage	44	1968-2012	12	None					Small sample
Nest failure rate at chick stage	44	1968-2012	15	Curvilinear	4.66% nests/day	3.36% nests/day	-27.9%		Small sample
Laying date	44	1968-2012	18	Linear decline	Jun 25	Jun 14	-11 days		Small sample

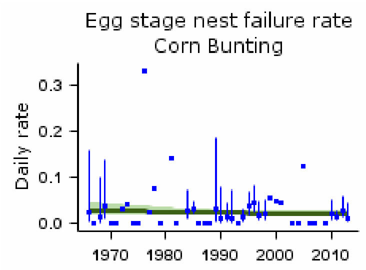
For details of analytical methods for the Nest Record Scheme, the Constant Effort Sites (CES) and the Retrapping Adults for Survival (RAS) scheme, please follow links here.



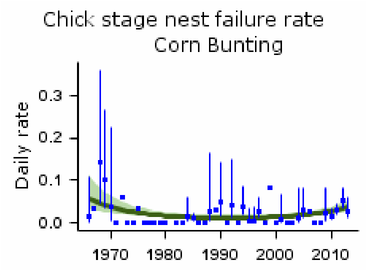
Mean number of eggs per nest - green bars represent standard error and black line shows long-term trend



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. 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 evidence available.

Breeding performance per nesting attempt 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 frequently 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 on 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: House Martin, by Edmund Fellowes / BTO; Lapwing, by Sarah Kelman / BTO

BirdTrends 2014: 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 1966–2014.

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.

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