BBS

The Breeding Bird Survey 2016 *incorporating the Waterways Breeding Bird Survey*

The population trends of the UK's breeding birds

BTO Looking out for birds

JNCC

rspb giving nature a home

THE 2016 BBS REPORT

THE BBS PARTNERSHIP

The Breeding Bird Survey (BBS), now incorporating the Waterways Breeding Bird Survey (WBBS), is run by the British Trust for Ornithology (BTO) and is funded jointly by BTO, the Joint Nature Conservation Committee (JNCC) (on behalf of the statutory nature conservation bodies: Natural England, Natural Resources Wales, Scottish Natural Heritage and Department of Agriculture, Environment and Rural Affairs, Northern Ireland), and the Royal Society for the Protection of Birds (RSPB).

The members of the BBS Steering Committee in 2016 were James Pearce-Higgins (Chair, BTO), Deborah Procter (JNCC), Mark Eaton (RSPB), David Noble (BTO), Simon Gillings (BTO) and Dawn Balmer (BTO).

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THE BBS TEAM AT THE BTO

Sarah Harris is the BBS National Organiser and first point of contact for BBS or WBBS queries. Sarah is responsible for the day-to-day running of these surveys, liaising with BTO Regional Organisers and volunteers, maintaining the databases, promoting the schemes, and producing the annual report.

Dario Massimino, Research Ecologist in the Population Ecology and Modelling Team, worked on the bird population trends for 2016 and Stuart Newson assisted in the production and development of the mammal population trends. David Noble is the Principal Ecologist for Monitoring, responsible for strategic developments in biodiversity monitoring. Dawn Balmer is Head of Surveys, which includes both BBS and WBBS, among other surveys, Simon Gillings oversees the BBS research programme and James Pearce-Higgins is the Director of Science at BTO.

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ONLINE RESOURCES...

Further information, including population trend graphs, can be found at www.bto.org/bbs, and a full species-by-species discussion of these results, and those from other surveys, can be found on the BirdTrends website at www.bto.org/birdtrends.

This report can be downloaded from www.bto.org/bbs/results/bbsreport.htm.

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The founder sponsors of the 1998 WBBS pilot year were Thames Water, British Waterways, Severn Trent, Hyder (Welsh Water) and Anglian Water. Since then surveys have been funded by the Environment Agency and BTO, and sponsored by Severn Trent, Anglian Water and by Essex & Suffolk Water.

Report production was by Sarah Harris and we are very grateful to John Marchant for proofreading the report. The report was printed by Swallowtail, Norwich, using paper from responsible sources.

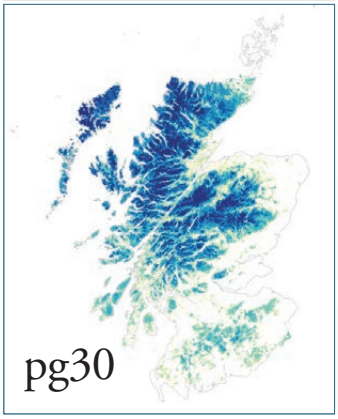
COVER IMAGE – NUTHATCH: JOHN FLOWERDAY

INSIDE...

This is the twenty-second annual report of the BTO/JNCC/RSPB Breeding Bird Survey (BBS), containing the population trends of widespread UK bird species during the period 1994–2016.

The BBS is the main scheme for monitoring the population changes of the UK's common breeding birds, providing an important indicator of the health of the countryside. BBS trends are produced each year for over 110 species, and the results are used widely to set priorities and inform conservation action.

The Breeding Bird Survey Partnership has now adopted the Waterways Breeding Bird Survey, previously funded by BTO, with financial support from the Environment Agency, and this report will now incorporate news, trends and research from this waterways-specific monitoring scheme.



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PURPLE HERON: JASON WARD, CURLEW & KINGFISHER: NEIL CALBRADE

The BBS year

Record-breaking coverage, website developments for both BBS Online and the Wider Countryside Butterfly Survey, and latest developments, a new BBS Twitter account and Upland Rover scheme.

By **Sarah Harris**, BBS National Organiser, BTO

In 2016, the Breeding Bird Survey achieved the highest coverage to date with **3,837** squares covered, only possible due to the dedication of **2,796** skilled volunteers. Thanks to all involved.

Coverage of Upland Adjacent squares increased to 113. These are squares adjacent to those considered 'upland' squares, enabling volunteers to cover a second upland square during the visit to their 'core' BBS square, and thus collect more data during visits to often very challenging squares. The aim of Upland Adjacent squares is to increase coverage in under-represented, remote areas of our uplands. See more on our research into further increasing the coverage in remote areas on page 12.

The proportion of squares for which Detection Type (whether a bird was first detected by song, call or visually) was recorded also increased, to 77% of all squares covered, as did the number of squares for which data were entered online, to 96%. However, all data submissions – online or paper – are gratefully received.

The main purpose of the BBS is the calculation of population trends for common and widespread species in the UK. In 2016 it was possible to calculate trends for 111 bird species and nine mammal species. Trends are calculated at a UK, country and English-region scale where the sample size allows. As a result, a staggering 848 bird trends and 53 mammal trends have been calculated for these species at the various scales.

▲ Meadow Brown, Marbled White and Brimstone were more widespread in 2016 than in any other year of the WCBS.

WIDER COUNTRYSIDE BUTTERFLY SURVEY

During the lifetime of the Wider Countryside Butterfly Survey (WCBS), 757 BBS squares have been revisited during July and August to carry out this survey. This equates to 45% of all squares contributing to the WCBS. Butterfly Conservation volunteers cover the remaining 55% of WCBS sites.

A total of 771 squares were surveyed in 2016, 39% of which were BBS squares. This was a slight decrease in coverage from 2015, with BBS coverage down by 3%. During the core recording period in 2016, 43 species were recorded from 1,288 visits to 644 squares. Large White, Small White and Speckled Wood were more widespread than in 2015, and Peacock, Small Copper and Silver-washed Fritillary were less widespread than in any other year of the WCBS.

A new data-entry system on the UK Butterfly Monitoring Scheme (UKBMS) website was introduced for the WCBS in the summer of 2016. Both the old and the new system were available for data entry.

From 2017 onwards, only the new system will be available – for which BBS volunteers need to register with the UKBMS website. For guidance on how to register and use this new system for the first time, email bbs@bto.org.

FIND OUT MORE...

Wider Countryside Butterfly Survey Annual Newsletter 2016 Season and the **UKBMS report**
www.bto.org/volunteer-surveys/bbs/bbs-publications/other-reports

MEADOW BROWN: MOSS TAYLOR, MARBLED WHITE: JOHN FLOWERDAY, BRIMSTONE: AMY LEWIS

LOOKING FORWARD

With increases in the number of species for which trends can be calculated, calculations participation and data for the survey's 'optional extras' such as Detection Type and Mammal Recording, the future of the BBS is looking very positive. Of course, it is always important to think how we can improve the survey further, whether by increasing coverage in remote areas or improving the time taken to turn the data received into meaningful outputs.

Upland Rovers

Upland Rovers, mentioned on page 12, is part of future plans to increase coverage in remote areas across the UK. Upland Rovers enables volunteers to undertake one-off visits to a selection of the more remote BBS squares. The standard BBS methodology requires two visits to each square annually, over four weeks apart; however, we have taken the difficult decision to permit single one-off visits to remote upland squares on the basis that some information is better than none, just for these carefully selected squares. If you live near or are holidaying in a remote area of the UK, why not look online to view a map of available Upland Rover squares?
Find out more at www.bto.org/upland-rovers.

Data entry and reporting

In order to achieve earlier reporting, all data should be entered by the end of August and ideally as soon after the survey takes place as possible – when field notes are fresh in the mind. Earlier data submission would allow the publication of this report to be brought forward, ideally to a date before the beginning of the following year's survey period. This would also allow data to be provided to Bird Clubs and local Bird Reports earlier than is currently possible. Guidance and video tutorials covering BBS Online can be found here: www.bto.org/volunteer-surveys/bbs/taking-part/bbs-online.

Tweeting

The Breeding Bird Survey now has a Twitter account, @BBS_birds, enabling volunteers to share news from their Breeding Bird Survey, Wider Countryside Butterfly Survey or Waterways Breeding Bird Survey visits, along with sharing news and research from the survey itself.

Below are some news and images from a selection of BBS squares from visits in the 2017 season, with more to follow in the 2017 BBS report.

Sightings and coverage in 2016

RECORD BREAKING! 3,837 squares were surveyed in 2016

2016 was a record-breaking year for coverage, with an increase of 90 squares from 2015, and 78 squares more than the all-time record achieved in 2007. What an achievement! And with greater coverage come more robust trends and the possibility of reporting on a greater suite of species. Thank you to all who contributed to the survey.

SIGHTINGS

Two hundred and twenty species were recorded during the Breeding Bird Survey in 2016. Woodpigeon, Blackbird, Rook and Wren were the most numerous, with singles of Montagu's Harrier, Purple Heron, Glaucous Gull and Curlew Sandpiper, amongst others, providing a little diversity and excitement.

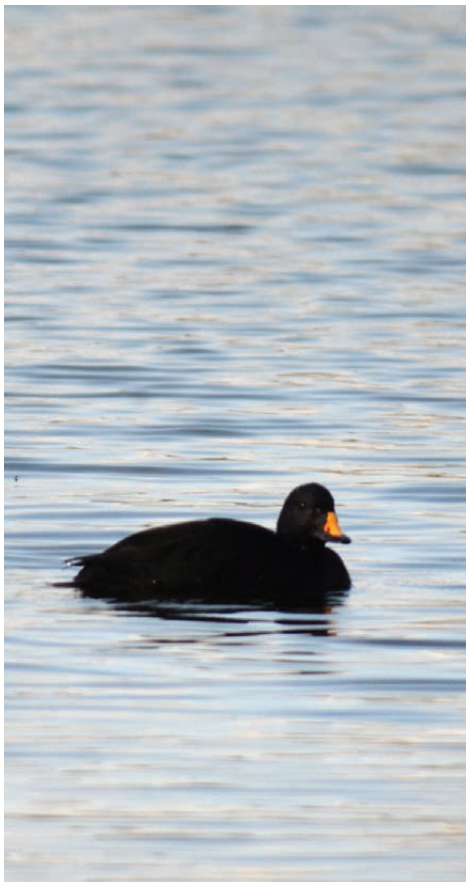
The number of species on squares varies hugely, with 55 squares containing five species or fewer through to a square on the banks of the River Mersey hosting an impressive 67 species. Whether for a species which we can report population trends or not, all records are valuable and are used in a variety of ways for research and analysis.

COLONY DATA

Colony data were collected on 457 squares in 2016, and included data for 19 colonial nesting species.

RECORDING DETECTION TYPE

Some more good news was that the number of squares for which 'Detection Type' is recorded (whereby it is noted whether a bird is first detected by song, call or visually) continued to increase. When first introduced in 2014, surveyors in 67% of squares reported this information, this rose to 74% in 2015 and then to 77% in 2016! It is hoped these data will allow for more precise estimates of abundance, by providing a measure of what proportion of the population are detected for each species during surveys, and thus how many individuals go undetected.



▲ This Common Scoter was a welcome bonus at an inland square just outside Birmingham.

COMMON SCOTER: SEBASTIAN BAVERSTOCK

Table 1 Number of BBS squares surveyed

	England	Scotland	Wales	Northern Ireland	Channel Islands	Isle of Man	UK total
1994	1,175	245	123	25	1	4	1,573
1995	1,342	286	121	17	1	4	1,771
1996	1,436	309	117	65	7	4	1,938
1997	1,676	315	139	75	6	6	2,217
1998	1,715	313	194	85	7	6	2,320
1999	1,796	275	223	95	7	5	2,401
2000	1,766	246	215	83	7	3	2,320
2001*	539	78	22	0	7		646
2002	1,652	231	215	97	7	3	2,205
2003	1,740	255	214	109	7	4	2,329
2004	1,887	274	255	102	11	6	2,535
2005	2,182	305	271	120	13	3	2,894
2006	2,574	336	272	108	19	5	3,314
2007	2,822	517	269	131	16	4	3,759
2008	2,558	436	242	121	15	1	3,373
2009	2,571	431	235	116	17		3,370
2010	2,569	331	247	115	16		3,278
2011	2,539	359	224	110	15		3,247
2012	2,672	383	274	117	21	4	3,471
2013	2,730	474	332	127	26		3,689
2014	2,735	482	339	120	27		3,703
2015	2,826	476	341	78	23	3	3,747
2016	2,864	489	333	126	23	2	3,837

*2001 – foot-and-mouth disease

COVERAGE OVERVIEW

Fantastic news in that 2016 saw coverage reach a new high! This map illustrates square distribution including the 'core' BBS squares, the 113 'bolt-on' Upland Adjacent squares covered in 2016, and those squares introduced to the survey as Scottish Woodland Squares and still surveyed today.

Squares from the Upland BBS, covered in the past by professional fieldworkers, are not shown on this map nor in table 1 on page 6, but data from these squares are included in the data analysis and trend calculations for the years they were surveyed. Please see '*Backgrounds and Methods*' on page 26 for more information on these surveys.

Northern Ireland

"2016 saw a welcome return of the funding for professionally surveyed squares, and on top of the volunteer support, which held up well, the total squares surveyed increased year on year by 61% to 126 – a level that will help maintain a credible number of species trends in Northern Ireland."

Shane Wolsey, BTO Northern Ireland Officer

Scotland

"Coverage in Scotland continues to grow, which is fantastic. Targeted training and other initiatives have helped to improve coverage of more remote areas. A huge thank you to our wonderful volunteers who often go 'above and beyond' to collect these valuable data. Maybe in 2017 we will see more than 500 squares covered?"

Ben Darvill, BTO Development and Engagement Manager, Scotland

Isle of Man

"Coverage continues on the Isle of Man for the second year running, thanks to a dedicated BBS volunteer, keeping the isle on the BBS map!"

Sarah Harris, BBS National Organiser

Wales

"It is so heartening for the future that the effort put in by the team across Wales has not only contributed to record UK BBS coverage, but has brought on new volunteers, and further encouraged existing volunteers. Congratulations and thank you to the whole team across Wales for your effort."

Kelvin Jones, BTO Cymru Development Officer, Wales

England

"Remarkably, BBS coverage in England increased again in 2016, for the fifth year in a row, setting a new record. At this rate, it can't be long before 3,000 squares are surveyed, which will mean trends for more species, more regional trends, and greater precision in trends for species that we already report upon – priceless information for conservation. Thank you all!"

Mark Eaton, RSPB Principal Conservation Scientist

Channel Islands

"After a decline in coverage from 2014 to 2015, coverage appears stable, solely thanks to the efforts of volunteers and Regional Organisers."

Sarah Harris, BBS National Organiser

More than just trendy graphs

What's been learnt over the recent period of partnership? It's time to reflect on what we have learnt from the last seven years, and what lies ahead for our collaboration.

By **Simon Gillings** Head of Population Ecology & Modelling, BTO, and **Deborah Procter**, Senior Monitoring Ecologist, JNCC

In 2016, BBS volunteers counted a staggering 1.2 million birds, providing the key ingredient for the production of population trends. These data are also central to a programme of development and interpretation work to ensure BBS remains a gold-standard scheme delivering insights about the UK's common and widespread birds. As we embark on a new BTO/JNCC/RSPB partnership, it's time to reflect on what we have learnt from our partnership working over the last seven years, and what's ahead for our collaboration.

GOLD-STANDARD MONITORING

We're continually looking at ways to develop the scheme to make better use of the data BBS volunteers collect. A recurring theme has been detectability. Doing a BBS square and putting records into distance bands really brings home how some species can be detected at much greater distances than others. Analyses of these patterns has predictably confirmed that large species and those of open habitats are more easily detected, and are helping us quantify how detectability varies with time of day and season. In 2014, detectability recording was introduced and in 2016 surveyors on 77% of squares recorded whether birds were detected first by sight or sound, allowing us to measure more precisely how detectability varies with distance and behaviour. Collectively, these detectability insights allow us to get closer to estimating breeding density, allowing us to produce better population estimates, such as those we've developed for individual habitats.

Another aspect that affects how many birds are recorded on a square is the skill of the observer. This is a tricky thing to measure and a difficult subject to approach. We've found some evidence of an experience effect, whereby surveyors take longer and find slightly fewer species in the first year covering a new square compared to subsequent years. However, this effect is so small it has no impact on trends produced for 75 of 76 species. We've yet to look at the impact of other aspects of observer variation, such as how accurately and consistently we estimate the distance to a singing Wren.

MONITORING STATUS AND CAUSES OF CHANGE

The trends we produce not only indicate which species are faring better or worse, they also allow us to delve into underlying causes. By combining square-level trends in numbers of birds and deer we've been able to show that deer browsing is negatively impacting five of 11 birds of woodland understorey, including the red-listed Nightingale and Willow Tit. For a wider suite of 59 species, the two factors that most clearly distinguished increasing and declining species were their breeding habitat and migration strategy. For migrants, species wintering in different parts of Africa declined at different times. This ground-breaking BBS study has been the inspiration for much of our recent tracking work. Closer to home, we found that BBS squares that are good for birds are generally also good for butterflies, giving some reassurance that monitoring one group of species well is useful more widely (though never the complete story). Analysis of patterns of change in Curlew populations across the country is providing important evidence about the likely drivers of those changes, which can be used to inform conservation responses.

UNDERSTANDING ECOLOGICAL PROCESSES

The annual nature of visits and the wide geographical spread of squares make BBS data invaluable for quantifying bird responses to climate change. Our BTO atlases have shown how species have colonised new northerly locations; analyses of BBS data shows this is also matched by shifts in the abundance of species, many of which are becoming more abundant in the north. As patterns of abundance change, so the community of species at a location changes. We've detected a widespread increase in species richness, particularly in the uplands, but as communities have become richer they have become more similar to each other. This occurs as a result of the generally positive impacts of warmer temperatures on common and widespread generalist species, which have become more common, but less positive impacts on species with more specialist habitat requirements.

▲ Square-level trends in numbers of birds and deer enabled us to show that deer browsing is negatively impacting five of 11 birds of woodland understorey in lowland England, including species such as Willow Tit.

WILLOW TIT: EDMUND FELLOWES

SUSTAINING SPECIES AND HABITATS

Much of the BBS-funded work has involved detecting changes in populations and communities and understanding the causes of change. Those same data can also be used to identify solutions to reverse population declines. Partly in response to significant declines in bird populations in urban habitats identified by our analysis of habitat-specific trends, work is currently under way to investigate how the extent and configuration of habitats in urban BBS squares impact the species present. Importantly, this work can be used to improve the design of the new estates and towns that are likely to be built in response to the need for more housing for an increasing population, so that they are more beneficial for biodiversity, and might also be better for people.

LOOKING AHEAD

In April 2017 a new BTO/JNCC/RSPB five-year BBS agreement was established by the partners. This continuing collaboration has a mix of maintaining the well-established approaches that have delivered so much over the years as well as expanding the scope of field data gathering. A particularly welcome change is that the WBBS (see page 32) has now become a formal part of the agreement. Other developments include continuing to explore how we can get more data from hard-to-reach or more remote areas. The partnership will also be investigating options to innovate in our analytical approaches, for example to produce new short-term trends for rapidly increasing species (e.g. Mandarin, Egyptian Goose, Little Egret).

Conservation actions for migratory landbirds in Africa

How data from the Breeding Bird Survey are used to direct the conservation of migratory landbirds.

By **David Stroud**, JNCC, **Nicola Crockford**, Principal Policy Officer, RSPB, and **Kate Hand**, Senior International Policy Officer, RSPB

The consequences of land-use change in UK for birds have become increasingly understood, and are now the focus of a range of conservation measures – notably agri-environment schemes – to halt and reverse negative population trends. However, less well understood are the various negative impacts on populations of long-distance migrants during non-breeding periods when they are away from the UK.

CONSERVING SHARED SPECIES

The Convention on Migratory Species (CMS) provides a range of mechanisms through which its 124 Parties can collaborate internationally to conserve shared species. The 1995 African–Eurasian Waterbird Agreement is well known and has stimulated a wide range of activities for migrant waterbirds, whilst the UK sponsored the development of a Memorandum of Understanding on migrant raptors in 2008. More recently, in 2014, the Convention adopted an African–Eurasian Migratory Landbirds Action Plan (AEMLAP) with the aim of improving the conservation status of long-distance landbird migrants, especially those that overwinter south of the Sahara in the Sahel.

An initial drafting workshop hosted by Ghana in 2012 developed a framework for national and international conservation actions focusing especially on non-breeding habitats which are less likely to be subject to conservation activities.

The geographic scope of the Plan is enormous – stretching across Eurasia from Iceland to Kamchatka, from high-arctic Svalbard to South Africa – encompassing the totality of multiple species' migration systems. It includes many species monitored by BBS (see table 2) and UK data provide a key input to assessing the international status of these species.

GRASSHOPPER WARBLER & SWIFT: GRAHAM CATLEY, TURTLE DOVE: TOM STREETER, SEDGE WARBLER: PAUL HILLION, YELLOW WAGTAIL: CHRIS KNIGHTS

Table 2 A selection of the African–Eurasian migrant landbirds monitored by the BBS and included within the scope of AEMLAP

Turtle Dove	Wood Warbler	Grasshopper Warbler	Redstart
Cuckoo	Chiffchaff	Sedge Warbler	Whinchat
Swift	Willow Warbler	Reed Warbler	Wheatear
Sand Martin	Blackcap	Spotted Flycatcher	Yellow Wagtail
Swallow	Garden Warbler	Nightingale	Tree Pipit
House Martin	Whitethroat	Pied Flycatcher	Meadow Pipit

UNDERSTANDING THE ISSUES

The unfavourable conservation status of many African–Eurasian migrants is thought to be, at least in part, caused by the loss, degradation and fragmentation of non-breeding habitats resulting from economic activities, land-use practices (that are often unsustainable), ultimately caused by growing human populations. Understanding and addressing these issues are priority themes for the Plan.

Climate change is likely to have an exacerbating effect, causing ecological dislocations in time and space with implications for these migrants.

A selection of the key issues identified in the Plan include:

Action Plan themes	Conservation needs
Habitat conservation	Promote agricultural policies that support participatory, sustainable natural resource management practices
	Promote biodiversity-friendly farming systems
	Develop policies that maintain and manage natural and semi-natural habitats of value for migrant landbirds
Protection of sites of national and international importance	Designate important sites under relevant national and international conservation regimes
Taking and trade	Identify migrant landbirds subject to taking and trade
	Undertake actions to regulate legal trade and eliminate illegal killing
Mortality through collisions with infrastructure	Avoid, reduce and mitigate collisions with existing and new infrastructure through implementation of best-practice development and planning policies
Capacity development in other countries	Support provision of targeted research and monitoring training
Education and awareness	Improve public awareness and understanding about migrant landbirds in all countries
Research and monitoring	Develop and implement standardised national monitoring schemes

PROVIDING A FOCUS

Often such high-level plans seem to be just a statement of the blindingly obvious, yet the valuable detail comes in their implementation. Thus, research is needed to understand what a "biodiversity-friendly farming system" is, and whether it is the same in all Sahelian countries. Already AEMLAP is providing a focus for researchers – including those from BTO, RSPB and many European universities, with an increasing range of studies starting to understand the ecology of migrants on their wintering areas.

To better understand the complex impacts of land-use change on people and biodiversity in West Africa, an international workshop was held in Abuja, Nigeria, in 2016. The meeting helped flesh out some immediate actions that countries could take to promote sustainable West African land uses, as well as longer-term needs.

The CMS Conference of the Parties in October this year will provide an opportunity to review AEMLAP implementation. Ultimately progress will need to be assessed in terms of species' conservation status. Given the extent of the issues identified in the Plan, the huge geographic areas concerned, and the immensity of the economic and other counter-pressures to be addressed, we can be sure that progress will be slow. However, the international community has an agreed international framework for action and that is a major step forward.

Our knowledge of UK trends for relevant migrants depends completely on BBS. The data annually collected by the survey are collated with those of other European countries by the Pan-European Common Bird Monitoring Scheme to provide critical inputs to AEMLAP.

To all those involved, thank you and keep counting!

FIND OUT MORE...

AEMLAP www.tinyurl.com/y7utqb5j

Abuja Declaration
www.birdlife.org/sites/default/files/abuja_declaration.pdf

Migrant Landbird Study Group
www.migrantlandbirds.org/index.php

Pan-European Common Bird Monitoring Scheme
www.ebcc.info/index.php?ID=28

Minding the gaps

How can BBS coverage in remote areas be improved?

By **Dawn Balmer**, Head of Surveys, BTO

Although we generally have excellent coverage of BBS squares across the UK, and covering a broad range of habitat types, it is crucial to constantly review the quality and usefulness of the information collected.

REMOTE AREAS

One area that has long been identified as needing better coverage is in the remote regions of the UK. This is often a challenging landscape to get to, far from where volunteers live, and away from the road network. Once a surveyor has got as close as possible by road, more often than not there is a long walk in to their square, sometimes even requiring an overnight stay in the mountains! BBS volunteers that carry out two BBS visits each summer in these remote and often upland squares are quite remarkable – thank you!

UPLAND ADJACENT SQUARES

In 2010 the concept of 'Upland Adjacent squares' was introduced, whereby volunteers covering a BBS square in the uplands can also cover the adjacent square on the same visit if the 'core' BBS square is considered an eligible upland square. Uptake of this option has been good, with 113 squares covered in 2016, collecting additional data for this under-represented habitat type with every BBS visit to the uplands.

FURTHER IMPROVEMENTS

Covering Upland Adjacent squares is a great way to capitalise on the effort of getting to the square, but we need to find other ways to get a wider range of squares covered in the uplands if we're to produce robust trends for species like Whinchat, or for countries beyond England. The pattern of coverage of remote, and often upland, squares was studied in detail to characterise each available 1-km square in terms of population density, elevation, steepness, forest cover and distance and ascent from the nearest public road. This proved very enlightening and highlighted the importance of tackling coverage, or lack of it, in remote areas. The BBS methods have been rigorously designed to ensure that robust trends are produced at relevant spatial scales (UK, country, region, county where possible) and the potential biases limited. With this in mind, any potential changes to the BBS methodology are always considered very carefully. Four potential interventions to reduce bias and increase coverage in the uplands were identified. One of these, Upland Rovers, was trialled in 2017 and the costs and benefits of the remaining options are currently being considered.

UPLAND ROVERS

The concept of Upland Rovers (volunteers offering single, one-off visits to specially selected squares) was identified as being quickly implementable and was trialled during the second half of the 2017 season. It is hoped this will continue as the next development in the mission to 'even out' coverage across the UK. Find out more about Upland Rovers at www.bto.org/upland-rovers. Further work will focus on the other proposals over coming months.

Future considerations

Research into increasing coverage in the uplands is not over yet! There are other options which need to be explored, or might prove useful if current plans, i.e. Upland Adjacent squares and Upland Rovers, are insufficient.

- Upland Rovers *(pilot in 2017)* – single visits to carefully selected, remote squares
- Replacement of inaccessible squares with more accessible alternatives, which are 'matched' with respect to habitat and other characteristics
- Research into a method of generating 'random' squares in an unbiased way whilst excluding the most inaccessible squares
- Research into how to adjust the bias identified with uneven coverage during trend calculations

WHINCHAT: EDMUND FELLOWES

Interpreting BBS and WBBS results

The pages which follow (pages 14–25) contain the annual bird population trend statistics for the Breeding Bird Survey (BBS) and pages 34–35 cover the Waterways Breeding Bird Survey (WBBS) results. For the most part, the table and graph layouts are the same: some guidance on reading these tables and graphs is therefore provided here, with other relevant hints on interpreting the information displayed.

THRESHOLDS FOR TRENDS

To produce robust results we produce trends only for species with sufficient data. To judge this we look at the average number of squares per year on which a species has been recorded since the survey began in 1994. For UK trends we consider species above a reporting threshold of 40 squares, with the exception of Mandarin Duck and Nightingale. These two species have a primarily English distribution and reach the reporting threshold in England, and are therefore included in the UK trends.

For countries within the UK, English Regions and UK WBBS trends, the threshold is 30 squares since the surveys began, 1994 for BBS and 1998 for WBBS.

BBS 'ADD-ON' SQUARES

'Add-on' squares surveyed over the lifetime of the BBS, using BBS methodologies, have been included in these trends.

These include Upland BBS, Upland Adjacent and Scottish Woodland squares. Upland BBS and Scottish Woodland squares were originally surveyed by professional fieldworkers: Scottish Woodland squares are now surveyed by volunteers.

Upland Adjacent squares are also covered by volunteers during visits to survey their core BBS square: these were introduced as an option to increase coverage in remote upland areas (see page 12).

ONLINE RESOURCES...

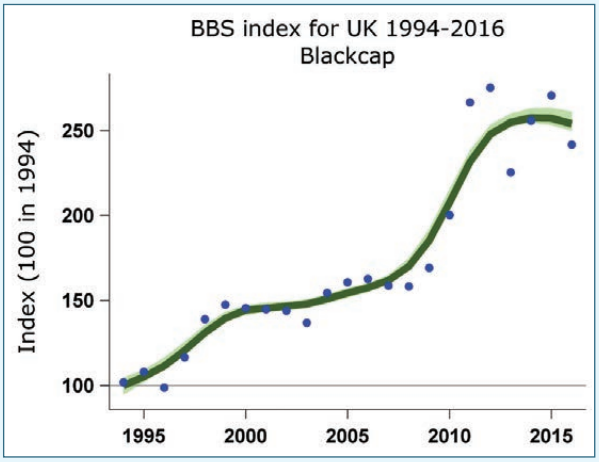
BBS Trend graphs online: www.bto.org/bbs-graphs
BBS Trend tables online: www.bto.org/bbs-tables
WBBS results online: www.bto.org/volunteer-surveys/wbbs/results

INTERPRETING GRAPHS

All BBS and WBBS graphs are displayed in the same way throughout the report. Beware, however, the index axis does vary in scale as do the time periods between the surveys.

BBS index graphs for 1994–2016 show:

- smoothed trend – dark green line
- confidence interval – pale green shading
- annual index values – blue dots



TRENDS AND TABLES EXPLAINED

Species	Sample	15–16	95–15	LCL	UCL
(Common Tern)	68	-13	16	-51	188
Feral Pigeon	707	-10	-21 *	-32	-8
Stock Dove	847	-13 *	20 *	7	35

- Trends for species in brackets are reported with caveats (see page 26).
- **Red-listed** and **Amber-listed** species from 'Birds of Conservation Concern 4' are shown in the relevant colour.
- The sample is the mean number of squares per year on which the species was recorded during BBS: 1994–2016 or WBBS: 1998–2016.
- Trends are presented as the percentage change over two periods.
- The short-term change covers the most recent year of the survey, i.e. for BBS and WBBS: 2015 to 2016 (15–16 in the tables).
- The long-term change covers the lifetime of the survey, i.e for BBS: 1994–2016 and WBBS: 1998–2016. It has been smoothed, and the end years truncated. For BBS this is labelled as 95–15 in the tables and for WBBS, as 99–15.
- Trends with statistically significant changes are marked with an asterisk (*), where the 95% confidence limits of the change do not overlap zero.
- LCL and UCL are the lower and upper 95% confidence limits for the 1995–2015 trend for BBS, 1999–2015 for WBBS.

United Kingdom – population trends

Wood Warbler declined by 57% in the UK between 1995 and 2015

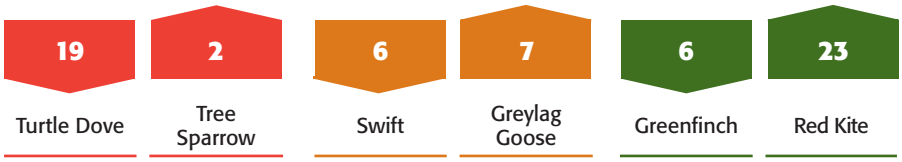
Data from BBS squares across the UK have been used to calculate population trends for 111 bird species, of which 68 had statistically significant long-term trends. Species included are those which reach the reporting threshold for the UK as well as Mandarin Duck and Nightingale, which reach the reporting threshold in England.

STATISTICALLY SIGNIFICANT RESULTS

Period	No. species	Greatest change	
Long-term (95–15) increases	**36**	Ring-necked Parakeet:	**1,455%**
Long-term (95–15) declines	**32**	Turtle Dove:	**-94%**
Short-term (15–16) increases	**5**	Spotted Flycatcher:	**34%**
Short-term (15–16) declines	**25**	(Barn Owl):	**-35%**

▼ Total number of long-term statistically significant results by **Birds of Conservation Concern 4** (BoCC4) status: Red, Amber or Green.

▼ Total number of long-term increasing or declining by BoCC4 status, followed by the species with the greatest population change for each status list.



WOODLAND WANDERERS

Spotted Flycatcher, **Wood Warbler**, **Garden Warbler** and **Nightingale** all have some traits in common. They are long-distance migrants, travelling down to the humid zone of sub-Saharan West Africa, occupying woodland habitats and they are all in decline. Three of the four are found on the Red List of Birds of Conservation Concern (BoCC4). **Garden Warbler** remains on the Green List.

Due to their largely English distribution, **Nightingale** are discussed in more details in the English population trends section (page 16).

Suggested drivers for the long-term decline seen in **Spotted Flycatcher** (-38%), **Wood Warbler** (-57%) and **Garden Warbler** (-23%) include changes in land use and climate in wintering areas, issues along migration routes and changes back in the breeding grounds here in the UK. It is therefore difficult to pinpoint what exactly is causing the declines in these woodland species.

All inhabit woodlands, albeit in slightly different ways; **Spotted Flycatcher** prefer deciduous woodlands with open glades, **Wood Warbler** like closed-canopy beech or oak woodland and **Garden Warbler** favour scrub and woodland edge.

With slightly different habitat preferences here in the UK and little known about preferences in wintering grounds, it remains hard to pinpoint where drivers of decline are playing a part. Tracking projects could hold the key to filling this knowledge gap.

Predation of nests has been a suggestion as influencing **Spotted Flycatcher** declines and deer browsing may be impacting on the **Garden Warbler**, by reducing foraging and nesting areas. Research in southwest England, Wales and in West Africa is attempting to identify the cause of **Wood Warbler** declines.

WOODLAND POSITIVES

It's not all negative news though. The short-distance migrant, **Chiffchaff**, and UK year-round resident, **Nuthatch** both increased during 1995–2015, by 109% and 90% respectively.

In general, short-distance migrants, which travel to the Mediterranean and North Africa, are faring better than those heading further south. The increasing **Chiffchaff** trend is in part due to large increases in Scotland, as the species' range extends further north and further uphill as climate change makes these areas more suitable.

Nuthatch, a species of mixed and deciduous woodland, is also expanding northwards, having first bred in the Scottish Borders in 1989. In this case, milder winters and increased food availability – including at garden feeding stations – are thought to be possible reasons for the increase.

FIND OUT MORE...

Eaton, M.A., Aebischer, N.J., Brown, A.F., Hearn, R.D., Lock, L., Musgrove, A.J., Noble, D.G., Stroud, D.A. & Gregory, R.D. 2015. Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man. *British Birds* 108: 708–746. (www.britishbirds.co.uk/wp-content/uploads/2014/07/BoCC4.pdf)

BirdTrends www.bto.org/birdtrends

Table 3 UK population trends during 2015–16 and 1995–2015

Species	Sample	15–16	95–15	LCL	UCL
Mute Swan	264	-18	26	-5	80
Greylag Goose	240	26	232 *	7	632
Canada Goose	518	-31 *	75 *	42	141
Shelduck	152	0	-5	-43	44
Mandarin Duck	33	-6	405	not estimable	
Gadwall	43	43	131 *	35	337
Mallard	1,379	2	18 *	6	34
Tufted Duck	163	-7	43 *	8	87
Goosander	43	-41	-21	-50	40
Red-legged Partridge	576	-21 *	6	-6	21
Red Grouse	148	-27 *	13	-8	48
Grey Partridge	223	-26 *	-60 *	-67	-53
Pheasant	1,926	-9 *	29 *	21	38
(Cormorant)	253	8	17	-11	49
(Little Egret)	46	-10	2,894	not estimable	
(Grey Heron)	677	-7	-12	-23	2
Little Grebe	72	-7	42	0	98
Great Crested Grebe	74	-20	10	-29	52
Red Kite	145	8	1,231*	673	2,254
Sparrowhawk	356	-20 *	-16 *	-27	-2
Buzzard	1,095	-1	84 *	67	105
Moorhen	660	-8	-12 *	-20	-2
Coot	282	-12	17	-7	44
Oystercatcher	359	-5	-23 *	-32	-11
Golden Plover	66	-16	-20	-41	2
Lapwing	690	-13 *	-43 *	-49	-34
Curlew	528	3	-48 *	-55	-42
Common Sandpiper	72	0	-15	-34	6
Redshank	88	-10	-38	-60	0
Snipe	170	-11	19	-2	43
(Common Tern)	68	-13	16	-51	188
Feral Pigeon	707	-10	-21 *	-32	-8
Stock Dove	847	-13 *	20 *	7	35
Woodpigeon	2,627	-3	35 *	27	43
Collared Dove	1,409	-7 *	3	-5	10
Turtle Dove	131	-22	-94 *	-96	-93
Cuckoo	705	-9 *	-43 *	-49	-35
(Barn Owl)	48	-35 *	217 *	116	379
Little Owl	94	23	-57 *	-66	-43
(Tawny Owl)	94	-13	-28 *	-44	-6
Swift	1,046	-7	-51 *	-56	-44
Kingfisher	56	16	-8	-37	49
Green Woodpecker	852	-4	31 *	20	46
Gt Spotted Woodpecker	1,149	-7 *	130 *	114	151
Kestrel	675	-31 *	-38 *	-45	-29
Hobby	44	-12	-12	-39	33
Peregrine	51	-8	-13	-43	28
Ring-necked Parakeet	78	12	1,455*	509	7,301
Magpie	1,990	-6 *	-2	-6	3
Jay	818	-8	19 *	9	31
Jackdaw	1,841	-11 *	54 *	43	70
Rook	1,364	-1	-20 *	-29	-10
Carrion Crow	2,497	1	18 *	10	26
Hooded Crow	138	-14	17	-8	52
Raven	333	7	46 *	6	101
Goldcrest	829	3	11	-7	35

Species	Sample	15–16	95–15	LCL	UCL
Blue Tit	2,435	-7 *	1	-3	4
Great Tit	2,316	-12 *	37 *	31	42
Coal Tit	865	-9	0	-12	12
Willow Tit	47	-34	-80 *	-86	-71
Marsh Tit	148	-15	-41 *	-52	-27
Skylark	1,803	2	-22 *	-27	-17
Sand Martin	138	16	39	-21	128
Swallow	2,074	-19 *	18 *	9	27
House Martin	962	-9	-11 *	-20	0
Long-tailed Tit	1,018	2	17 *	6	31
Wood Warbler	53	-11	-57 *	-77	-25
Chiffchaff	1,643	8 *	109 *	97	124
Willow Warbler	1,426	-1	-11 *	-21	-3
Blackcap	1,726	-11 *	145 *	128	161
Garden Warbler	456	-17 *	-23 *	-32	-11
Lesser Whitethroat	286	2	6	-11	23
Whitethroat	1,440	6	30 *	20	45
Grasshopper Warbler	85	-7	-17	-44	30
Sedge Warbler	307	0	-10	-28	15
Reed Warbler	135	8	17	-8	48
Nuthatch	543	-10 *	90 *	67	114
Treecreeper	373	4	9	-6	22
Wren	2,579	9 *	32 *	26	38
Starling	1,786	-10 *	-51 *	-55	-47
Dipper	64	15	-20	-46	15
Blackbird	2,603	-2	22 *	18	28
Song Thrush	2,102	5	22 *	16	29
Mistle Thrush	1,185	4	-25 *	-32	-17
Spotted Flycatcher	191	34 *	-38 *	-54	-21
Robin	2,500	7 *	25 *	21	30
Nightingale	33	-9	-48 *	-66	-18
Pied Flycatcher	40	-15	-41	-74	4
Redstart	183	-8	43 *	19	69
Whinchat	77	9	-51 *	-66	-35
Stonechat	158	18	53 *	12	104
Wheatear	358	-9	-16	-34	2
Dunnock	2,175	-1	23 *	18	30
House Sparrow	1,680	-6 *	-6 *	-13	-1
Tree Sparrow	195	-8	119 *	67	192
Yellow Wagtail	163	21 *	-42 *	-51	-29
Grey Wagtail	225	-4	-6	-23	12
Pied Wagtail	1,317	-4	0	-8	8
Tree Pipit	147	-3	8	-18	36
Meadow Pipit	836	-5	-7	-14	2
Chaffinch	2,614	-11 *	-2	-5	4
Bullfinch	650	-5	10	-2	21
Greenfinch	1,815	-16 *	-46 *	-49	-42
Linnet	1,252	-8	-21 *	-28	-11
Lesser Redpoll	174	-13	27	-5	66
Crossbill	59	-19	-2	-47	38
Goldfinch	1,776	-6	122 *	105	138
Siskin	199	-10	61 *	18	96
Yellowhammer	1,220	-5	-16 *	-22	-9
Reed Bunting	526	-12	31 *	14	51
Corn Bunting	145	-13	-34 *	-49	-19

INTERPRETING THE RESULTS: see page 13

TREND GRAPHS ONLINE: www.bto.org/bbs-graphs

England – population trends

Nightingale declined by 48% in England between 1995 and 2015

Of the 111 species for which UK trends are available, 105 trends were produced for England. Seventy of these English long-term trends were statistically significant. Crossbill sits just below the reporting threshold and Cetti's Warbler is getting closer to this target each year.

STATISTICALLY SIGNIFICANT RESULTS

Period	No. species	Greatest change	
Long-term (95–15) increases	**34**	Red Kite:	**19,918%**
Long-term (95–15) declines	**36**	Turtle Dove:	**-94%**
Short-term (15–16) increases	**6**	Yellow Wagtail:	**20%**
Short-term (15–16) declines	**24**	Canada Goose:	**-36%**

WOODLAND BIRDS

Willow Tit has suffered a decline of 82% in England between 1995 and 2015. This has resulted in some localised extinctions and contraction in range, which is now largely concentrated in a band from northeast England to south Wales.

Unlike their Scandinavian and European cousins, race *borealis,* birds in England, *kleinschmidt,* do not tend to nest in coniferous woodlands, preferring young, damp woodlands with some dead wood for nesting. Suitability of some woodlands affected by deer browsing, drying up of soils due to increasingly dry summers and canopy closure are thought to have contributed to this decline.

Humid-zone migrant, the **Nightingale**, has also declined in England, by 48% long term (1995–2015). This is thought to be due to a combination of issues here in the UK, such as deer browsing, and habitat degradation on the wintering grounds.

OH DEER...

For both **Willow Tit** and **Nightingale**, deer have been found to have a negative impact on the understorey habitats in which they both forage, and where **Nightingale** nests.

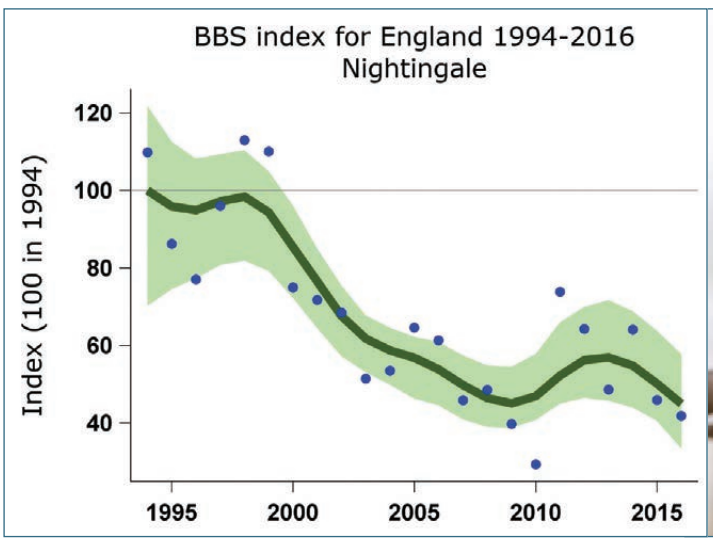
Roe Deer, a species that has increased by 60% in England since 1995, is thought to be the deer species having the greatest impact on both **Willow Tit** and **Nightingale**.

An experimental study published in 2010 showed a correlation between **Nightingale** declines and deer increases, by excluding deer from certain areas suitable for nesting and comparing the number of **Nightingale** territories inside and outside the area. Over nine years, territories increased tenfold inside the deer exclusion zone.

FIND OUT MORE...

Holt, C.A., Fuller, R.J. & Dolman, P.M. 2010. Experimental evidence that deer browsing reduces habitat suitability for breeding Common Nightingales *Luscinia megarhynchos*. ***Ibis*** 152: 335–346.

Newson, S.E., Johnston, A., Renwick, A.R., Baillie, S.R. & Fuller, R.J. 2012. Modelling large-scale relationships between changes in woodland deer and bird populations. ***Journal of Applied Ecology*** 49: 278–286.



NIGHTINGALE: EDMUND FELLOWES

Table 4 Trends in England during 2015–16 and 1995–2015

Species	Sample	15–16	95–15	LCL	UCL
Mute Swan	226	-10	12	-9	56
Greylag Goose	198	-9	284 *	143	598
Canada Goose	478	-36 *	60 *	32	118
Shelduck	123	0	29	-15	70
Mandarin Duck	32	-3	414	not estimable	
Gadwall	41	32	121 *	18	365
Mallard	1,156	2	28 *	13	52
Tufted Duck	142	4	26	-6	62
Red-legged Partridge	557	-18 *	0	-13	14
Red Grouse	87	-12	14	-21	67
Grey Partridge	200	-20	-57 *	-64	-47
Pheasant	1,617	-7 *	29 *	20	39
(Cormorant)	211	-19 *	13	-8	54
(Little Egret)	42	-12	2,779	not estimable	
(Grey Heron)	556	0	-18 *	-30	-8
Little Grebe	57	-9	16	-28	68
Great Crested Grebe	67	-17	-3	-30	34
Red Kite	108	13	>10,000*	8,028	20,258
Sparrowhawk	295	-22 *	-21 *	-30	-9
Buzzard	754	2	194 *	154	245
Moorhen	611	-7	-13 *	-22	-4
Coot	254	-12	19	-3	55
Oystercatcher	201	-3	50 *	27	78
Lapwing	580	-7	-25 *	-34	-16
Curlew	345	10	-31 *	-40	-19
Common Sandpiper	31	15	-43 *	-64	-14
Redshank	62	-7	-35 *	-53	-17
Snipe	91	-20	13	-17	62
(Common Tern)	63	5	32	-17	136
Feral Pigeon	577	-11	-29 *	-40	-18
Stock Dove	780	-11 *	18 *	2	36
Woodpigeon	2,097	-2	38 *	29	46
Collared Dove	1,226	-8 *	0	-8	9
Turtle Dove	129	-22	-94 *	-96	-92
Cuckoo	544	-8	-69 *	-72	-65
(Barn Owl)	46	-35 *	238 *	149	430
Little Owl	91	28	-57 *	-67	-44
(Tawny Owl)	81	36	-29 *	-43	-7
Swift	903	-3	-50 *	-57	-42
Kingfisher	50	6	0	-30	45
Green Woodpecker	798	-6	41 *	30	54
Gt Spotted Woodpecker	1,000	-12 *	105 *	90	121
Kestrel	596	-25 *	-24 *	-30	-15
Hobby	43	-11	-9	-38	34
Peregrine	31	13	45	-17	147
Ring-necked Parakeet	78	12	1,455*	503	5,022
Magpie	1,664	-4 *	0	-4	5
Jay	704	-2	6	-3	16
Jackdaw	1,480	-10 *	65 *	52	78
Rook	1,087	-5	-13 *	-22	-2
Carrion Crow	2,051	4	27 *	18	35
Raven	156	5	130 *	2	296
Goldcrest	593	7	39 *	19	73

Species	Sample	15–16	95–15	LCL	UCL
Blue Tit	1,974	-5 *	-1	-6	4
Great Tit	1,875	-9 *	28 *	23	33
Coal Tit	580	-13 *	19 *	0	46
Willow Tit	42	-39	-82 *	-87	-71
Marsh Tit	135	-20 *	-41 *	-52	-26
Skylark	1,440	1	-23 *	-28	-18
Sand Martin	86	-11	9	-31	42
Swallow	1,595	-16 *	15 *	7	25
House Martin	744	4	-28 *	-35	-18
Long-tailed Tit	900	-7	10	0	23
Chiffchaff	1,379	9 *	111 *	98	125
Willow Warbler	945	-2	-43 *	-50	-37
Blackcap	1,467	-9 *	117 *	105	134
Garden Warbler	371	-10	-31 *	-40	-21
Lesser Whitethroat	273	6	8	-8	27
Whitethroat	1,237	2	28 *	19	36
Grasshopper Warbler	39	-8	-31 *	-57	-2
Sedge Warbler	195	13	-21 *	-41	-2
Reed Warbler	127	11	16	-7	57
Nuthatch	462	-8 *	91 *	67	115
Treecreeper	279	1	1	-13	14
Wren	2,017	10 *	27 *	20	32
Starling	1,454	-6	-60 *	-63	-56
Dipper	31	-18	-39	-62	14
Blackbird	2,073	0	19 *	15	24
Song Thrush	1,642	10 *	20 *	14	30
Mistle Thrush	936	5	-38 *	-43	-32
Spotted Flycatcher	133	0	-61 *	-69	-52
Robin	1,974	8 *	29 *	24	34
Nightingale	33	-9	-48 *	-66	-7
Redstart	102	-14	28 *	2	59
Whinchat	33	16	-37 *	-62	-15
Stonechat	69	26	55	-1	166
Wheatear	201	-16	-14	-40	19
Dunnock	1,771	2	17 *	11	25
House Sparrow	1,369	-4 *	-18 *	-24	-11
Tree Sparrow	152	1	69 *	32	137
Yellow Wagtail	159	20 *	-41 *	-51	-26
Grey Wagtail	152	-5	7	-15	36
Pied Wagtail	995	-1	-2	-10	8
Tree Pipit	75	-28 *	-46 *	-67	-15
Meadow Pipit	451	-11 *	-9	-20	2
Chaffinch	2,038	-10 *	-4	-9	0
Bullfinch	503	18 *	6	-6	16
Greenfinch	1,532	-12 *	-43 *	-46	-39
Linnet	1,014	-3	-20 *	-27	-12
Lesser Redpoll	68	33	-3	-39	62
Goldfinch	1,463	0	118 *	103	133
Siskin	76	-15	69	-14	225
Yellowhammer	1,059	-3	-26 *	-31	-21
Reed Bunting	398	-2	39 *	20	58
Corn Bunting	138	-7	-33 *	-48	-16

INTERPRETING THE RESULTS: see page 13

TREND GRAPHS ONLINE: www.bto.org/bbs-graphs

TREND TABLES ONLINE: www.bto.org/bbs-tables

Scotland – population trends

With the addition of Greylag Goose and Tree Sparrow, 64 trends were produced for Scotland. Of these species, 30 have long-term trends that are statistically significant. Stock Dove and Spotted Flycatcher are currently just below the reporting threshold.

STATISTICALLY SIGNIFICANT RESULTS

Period	No. species	Greatest change	
Long-term (95–15) increases	**20**	Chiffchaff:	**648%**
Long-term (95–15) declines	**10**	Kestrel:	**-69%**
Short-term (15–16) increases	**1**	Long-tailed Tit:	**132%**
Short-term (15–16) declines	**11**	Kestrel:	**-61%**

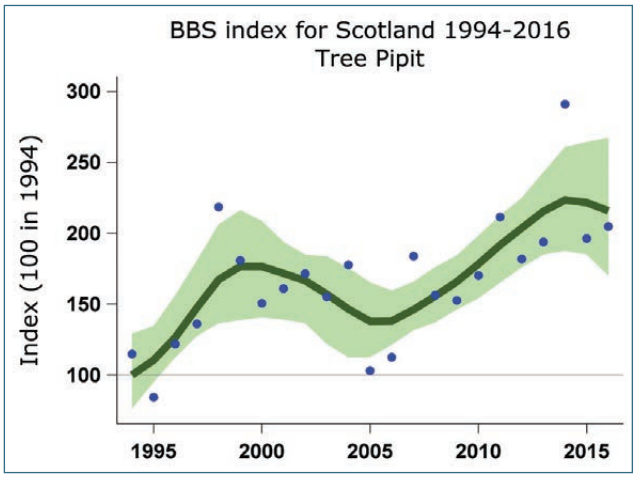
NEW ADDITIONS

Two species were added to the Scottish trend set in 2016. This is a great achievement, helping to reveal population changes not only for the UK as whole, but also for different countries within the UK. Seeing trends at various scales can sometimes provide clues as to the drivers behind population change for certain species.

The new trends show **Greylag Goose** has increased by 221% between 1995 and 2015, and **Tree Sparrow** by 429% during the same period.

Greylag Goose has undergone substantial range expansion and is now widespread in Scotland, with the exception of the uplands and northeast.

In a UK context, **Tree Sparrow** populations are most abundant in northeast England and eastern Scotland. Causes behind increases in these areas are unknown. **Tree Sparrow** declined massively from the late 1970s, so despite the recent increases it remain at one-twentieth of previous levels.



TREE PIPIT DOUBLE

Positive trends continue for Scotland, with a long-term increase of 100% (1995–2015) recorded for **Tree Pipit**. This summer visitor spends the winter months in the humid zone of West Africa and prefers wooded, scrubby habitats such as birch and conifer plantations in Scotland.

New plantations are being planted across Scotland at the moment, with an increase in woodland cover of around 12% since 1995. These are ideal for **Tree Pipit,** which prefers new plantations, before they mature. Maturation of plantations means they become less open and therefore less favourable for the species. Time will tell how the species fares into the future as Scotlands landscape changes due to forestry operations.

400 CLUB

Great Spotted Woodpecker has also increased in Scotland by 413% between 1995 and 2015 following substantial range expansion. The lowest densities are in the uplands and north of Scotland. The reasons behind this increase are not fully understood.

INTERPRETING THE RESULTS: see page 13

TREND GRAPHS ONLINE: www.bto.org/bbs-graphs

TREND TABLES ONLINE: www.bto.org/bbs-tables

TREE PIPIT: GRAHAM CATLEY

Table 5 Trends in Scotland during 2015–16 and 1995–2015

Species	Sample	15–16	95–15	LCL	UCL
Greylag Goose	30	**59**	**221**	-36	964
Mallard	113	**13**	**-12**	-28	9
Red Grouse	55	**-35** *	**8**	-15	39
Pheasant	154	**-18** *	**20**	-3	43
(Grey Heron)	54	**-6**	**0**	-29	38
Buzzard	156	**-4**	**22**	-1	53
Oystercatcher	139	**-6**	**-37** *	-49	-27
Golden Plover	38	**-22**	**-31** *	-52	-8
Lapwing	88	**-19** *	**-58** *	-69	-46
Curlew	128	**-2**	**-59** *	-68	-50
Common Sandpiper	35	**0**	**-13**	-32	5
Snipe	62	**-13**	**22**	-2	62
Feral Pigeon	71	**-22**	**4**	-33	61
Woodpigeon	228	**-10**	**13**	-12	44
Collared Dove	59	**-1**	**20**	-24	82
Cuckoo	79	**-5**	**33** *	8	68
Swift	54	**-31**	**-57** *	-70	-34
Gt Spotted Woodpecker	59	**7**	**413** *	273	631
Kestrel	41	**-61** *	**-69** *	-80	-46
Magpie	58	**-11**	**39**	-3	116
Jackdaw	132	**-14**	**23**	-6	65
Rook	120	**19**	**-33** *	-52	-4
Carrion Crow	212	**-3**	**-6**	-25	25
Hooded Crow	53	**-14**	**-27**	-54	10
Raven	53	**4**	**35**	-16	116
Goldcrest	98	**8**	**14**	-18	65
Blue Tit	181	**-13** *	**5**	-12	21
Great Tit	170	**-20** *	**64** *	38	96
Coal Tit	142	**3**	**-13**	-32	14
Skylark	223	**6**	**-23** *	-33	-11
Sand Martin	34	**36**	**87**	-34	479
Swallow	196	**-26** *	**33** *	8	56

Species	Sample	15–16	95–15	LCL	UCL
House Martin	75	**-21**	**121** *	50	228
Long-tailed Tit	33	**132** *	**63**	-10	164
Chiffchaff	65	**5**	**648** *	382	1,220
Willow Warbler	229	**-2**	**19**	-1	33
Blackcap	73	**-9**	**460** *	283	771
Whitethroat	91	**23**	**117** *	25	253
Sedge Warbler	58	**-18**	**21**	-26	85
Treecreeper	40	**-4**	**11**	-30	56
Wren	244	**8**	**67** *	44	86
Starling	160	**-14**	**-26** *	-43	-2
Blackbird	217	**-9**	**37** *	17	73
Song Thrush	193	**-2**	**28** *	8	55
Mistle Thrush	82	**12**	**28**	-4	82
Robin	217	**5**	**35** *	15	53
Stonechat	37	**11**	**23**	-24	89
Wheatear	86	**-10**	**-20**	-40	8
Dunnock	154	**-18** *	**57** *	30	89
House Sparrow	108	**-14** *	**50** *	16	93
Tree Sparrow	31	**-23**	**429** *	175	1137
Grey Wagtail	32	**15**	**-20**	-47	8
Pied Wagtail	147	**-11**	**-4**	-19	12
Tree Pipit	36	**4**	**100** *	28	175
Meadow Pipit	224	**0**	**-10**	-22	0
Chaffinch	260	**-13** *	**4**	-6	20
Bullfinch	46	**-35** *	**46**	-8	100
Greenfinch	108	**-35**	**-55** *	-71	-35
Linnet	96	**-16**	**-20**	-42	6
Lesser Redpoll	52	**-19**	**40**	-10	114
Goldfinch	109	**-16**	**181** *	104	282
Siskin	81	**-13**	**61** *	15	99
Yellowhammer	119	**-10**	**37** *	14	62
Reed Bunting	66	**-30**	**41** *	6	86

Wales – population trends

Siskin increased by 84% in Wales between 1995 and 2015

Two additions to the reporting for Wales, Siskin and Reed Bunting, brings the total number of population trends up to 56. Of these, 28 show statistically significant changes in the long term. Red Kite, Canada Goose and Grey Wagtail are all just below the reporting threshold of being recorded on an average of 30 squares or more since the start of the survey.

STATISTICALLY SIGNIFICANT RESULTS

Period	No. species	Greatest change	
Long-term (95–15) increases	**19**	Gt Spotted Woodpecker:	**180%**
Long-term (95–15) declines	**9**	Starling:	**-70%**
Short-term (15–16) increases	**2**	Stonechat:	**42%**
Short-term (15–16) declines	**8**	Curlew:	**-42%**

TWO NEW TRENDS

The **Siskin** is a bird of coniferous woodland. There are several suggestions for the drivers behind the UK increase of 61% long term (1995–2015), and increase in Wales by 84% since 1995. These include exploitation of garden feeding stations, and the ability to utilise these when the cone crop is poor, along with the increased availability of maturing conifer plantations. Conversely, the European trend for **Siskin** shows a 7% decline from 1980 to 2014.

With an increase of 29%, **Reed Bunting** joins the other 55 species for which we can report trends in Wales. This is not a statistically significant increase, but suggests the Welsh **Reed Buntings** are experiencing the same positive trends as elsewhere in the UK.

This could be a sign of recovery from pre-BBS declines in the 1970s, which are thought to have been due to agricultural intensification. **Reed Bunting** was moved from the Red to the Amber list of Birds of Conservation Concern in the 2009 assessment.

SISKIN: JOHN HARDING

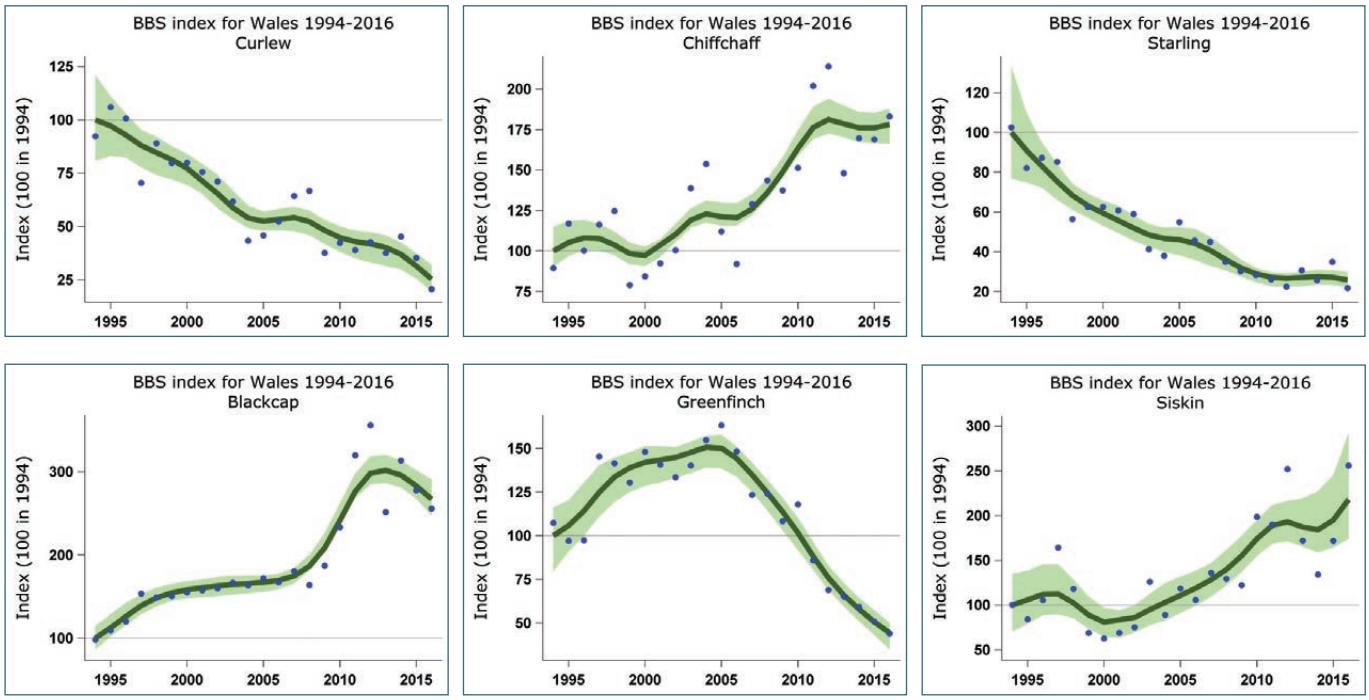


Table 6 Trends in Wales during 2015–16 and 1995–2015

Species	Sample	15–16	95–15	LCL	UCL
Mallard	72	-29	-12	-55	55
Pheasant	102	-11	47 *	12	84
(Grey Heron)	44	-46	-10	-40	44
Buzzard	151	1	-2	-20	15
Curlew	35	-42 *	-68 *	-79	-53
Feral Pigeon	37	30	49 *	1	115
Stock Dove	33	-15	88 *	18	214
Woodpigeon	201	-13 *	26 *	7	46
Collared Dove	78	-6	21	-25	75
Cuckoo	61	-16	-16	-41	11
Swift	66	-27	-59 *	-72	-38
Green Woodpecker	47	29	-20	-51	35
Gt Spotted Woodpecker	88	4	180 *	118	283
Magpie	172	-11	-21 *	-32	-11
Jay	79	-10	38	-1	88
Jackdaw	149	-14 *	27	-16	90
Rook	81	3	-42 *	-62	-15
Carrion Crow	217	-8	14	-7	32
Raven	99	7	34	-10	126
Goldcrest	89	-13	-30	-54	14
Blue Tit	190	-13 *	11	-5	25
Great Tit	182	-7	36 *	16	57
Coal Tit	79	-21	-24	-43	3
Skylark	108	-7	6	-15	36
Swallow	184	-22 *	30 *	5	67
House Martin	92	-29	-1	-32	41
Long-tailed Tit	65	-29	38	-1	103
Chiffchaff	153	8	67 *	37	96

Species	Sample	15–16	95–15	LCL	UCL
Willow Warbler	168	-4	-12	-25	2
Blackcap	136	-8	151 *	105	207
Garden Warbler	60	-18	-23	-45	10
Whitethroat	90	9	-19 *	-37	-1
Nuthatch	77	-6	47 *	15	84
Treecreeper	43	25	36	-12	92
Wren	211	9 *	34 *	20	47
Starling	81	-38 *	-70 *	-80	-57
Blackbird	211	-8	38 *	27	49
Song Thrush	178	3	24 *	11	42
Mistle Thrush	105	-5	-4	-27	28
Robin	206	5	11	0	24
Redstart	67	-6	33 *	9	78
Stonechat	40	42 *	139 *	63	294
Wheatear	58	12	-21	-42	6
Dunnock	165	2	34 *	16	58
House Sparrow	134	-3	79 *	45	124
Pied Wagtail	125	-5	8	-9	33
Tree Pipit	36	-1	-12	-41	40
Meadow Pipit	94	-8	7	-15	37
Chaffinch	211	-19 *	-13 *	-23	0
Bullfinch	67	-9	2	-22	27
Greenfinch	114	-14	-52 *	-65	-38
Linnet	97	-10	-9	-33	22
Goldfinch	140	-13	76 *	38	125
Siskin	31	49	84 *	10	242
Yellowhammer	33	25	-57 *	-73	-38
Reed Bunting	30	-38 *	29	-12	115

INTERPRETING THE RESULTS: see page 13

TREND GRAPHS ONLINE: www.bto.org/bbs-graphs

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Northern Ireland – population trends

Song Thrush increased by 52% in Northern Ireland between 1995 and 2015

In Northern Ireland, population trends were calculated for 34 species: of these, 18 showed statistically significant changes, most of which were long-term increases. Species just below the reporting threshold are Sedge Warbler, Lesser Redpoll and Mallard.

STATISTICALLY SIGNIFICANT RESULTS

Period	No. species	Greatest change	
Long-term (95–15) increases	**12**	Hooded Crow:	**179%**
Long-term (95–15) declines	**2**	Greenfinch:	**-52%**
Short-term (15–16) increases	**0**		
Short-term (15–16) declines	**4**	Bullfinch:	**-41%**

PAST AND PRESENT

Just over half the UK breeding population of **Song Thrush** has been lost since 1967. Change in first-winter survival has been suggested as the reason for this decline, but it is not clear what the driver behind this was. Habitat loss has also been suggested as a driver of decline, with removal of hedgerows and new field drainage systems reducing the availability of good foraging areas.

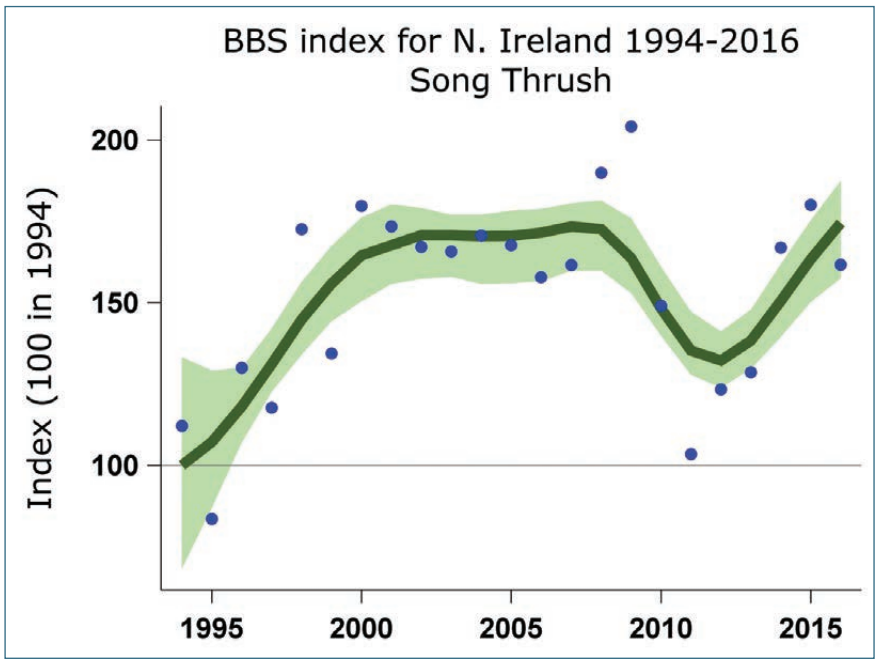
Deer browsing affecting the understorey habitats of woodlands, in which **Song Thrush** nest and forage, may also have contributed to the historical declines.

However, from 1995 to 2015, **Song Thrush** has increased by 52% in Northern Ireland and this is the largest of all increases when comparing with the UK – with a 22% increase – and country trends.

The reason for this change in the population trend is unknown, and it is unclear why the population is increasing faster in certain areas, such as Northern Ireland.

GREAT NEWS

With an increase of 172% from 1995 to 2015, **Great Tit** is another species doing well in the woodlands of Northern Ireland.



GREATTIT: JOHN HARDING

Increases in **Great Tit** numbers have been recorded since the 1960s via the Breeding Bird Survey and its predecessor, the Common Birds Census, with a UK increase during that period of 104%.

Earlier egg laying has been recorded in the UK, amounting to an advance of 11 days since 1968, in accordance with earlier spring greening in woodlands, though it is unclear whether this is having an influence on the overall population changes recorded by the two schemes.

Food provision at garden feeding stations has become more widespread and **Great Tit** are able to readily exploit this, especially through the winter months when natural food supply can became sparse. Warmer winters may also be playing a part in increasing survival rates.

INTERPRETING THE RESULTS: see page 13

Table 7 Trends in Northern Ireland during 2015–16 and 1995–2015

Species	Sample	15–16	95–15	LCL	UCL	Species	Sample	15–16	95–15	LCL	UCL
Pheasant	41	**-9**	**89** *	3	194	Blackcap	41	**-26**	**>10,000**	not estimable	
Buzzard	32	**-3**	**>10,000**	not estimable		Wren	92	**4**	**69** *	19	111
Woodpigeon	85	**1**	**87** *	34	136	Starling	79	**-7**	**33**	-7	98
Collared Dove	34	**-4**	**97** *	2	174	Blackbird	87	**-8**	**40** *	2	67
Magpie	83	**-6**	**6**	-19	47	Song Thrush	78	**-10**	**52** *	13	104
Jackdaw	76	**-11**	**98** *	31	149	Mistle Thrush	59	**-6**	**-2**	-55	71
Rook	73	**-22**	**-13**	-47	25	Robin	88	**6**	**19**	-5	39
Hooded Crow	82	**-18**	**179** *	105	278	Dunnock	70	**-6**	**86**	-1	149
Goldcrest	45	**2**	**35**	-20	64	House Sparrow	56	**-14** *	**54**	-11	150
Blue Tit	77	**-12**	**14**	-22	47	Pied Wagtail	46	**12**	**66**	not estimable	
Great Tit	74	**-32** *	**172** *	92	226	Meadow Pipit	63	**-24** *	**22**	-9	78
Coal Tit	64	**-25**	**48**	-11	105	Chaffinch	91	**-9**	**50** *	17	68
Skylark	31	**-4**	**-48** *	-61	-38	Bullfinch	33	**-41** *	**31**	-29	68
Swallow	84	**-16**	**-6**	-33	43	Greenfinch	47	**-26**	**-52** *	-75	-7
House Martin	45	**-29**	**108** *	16	242	Linnet	36	**-22**	**-4**	-41	47
Chiffchaff	35	**-22**	**18**	-25	45	Goldfinch	51	**-41**	**722**	not estimable	
Willow Warbler	80	**11**	**72** *	25	96	Reed Bunting	32	**-21**	**-14**	-44	62

SONG THRUSH: GRAHAM CATLEY

Channel Islands and the Isle of Man

Channel Islands

Coverage in 2016 fell slightly, after peaking in 2013 and 2014, though matched the 2015 coverage of 23 squares. **Herring Gull** was the most numerous of the 82 bird species recorded and of course the Channel Islands continue to keep **Short-toed Treecreeper** on the BBS species list for another year. Data collected on these squares are used in the calculation of the UK population trends.

Isle of Man

Efforts continue to maintain coverage on the Isle of Man, with two squares covered in 2016. Twenty-eight bird species were recorded, the most numerous being **Rook**. As with the Channel Islands, these data feed into the UK population trends.

English regions – population trends

478 trends calculated in English Regions

The threshold for reporting trends for a region is 30 squares per year, on average, since the survey began. Regional population trends have been calculated for 79 species, in as many as all nine English regions, depending on where the sample size was adequate to report trends.

Regional summaries of the trends are provided here and the largest statistically significant long-term trends (1995–2015) are highlighted. Regional variations can be seen throughout the table opposite, providing an insight into the complexity of changing population trends across England.

It is hoped that, with time and increased coverage, it will be possible to examine regional trends for other countries within the UK as well.

NORTH WEST

Fifty-seven trends calculated, 31 were significant: 21 increases and 10 declines. **Nuthatch** increased by 376% and **Swift** declined by 57%. Of the regional trends produced for **Sparrowhawk**, the decline has been greatest in the North West (-46%).

NORTH EAST

Thirty-six trends calculated, 16 were significant: 8 increases and 8 declines. **Chiffchaff** increased by 286% and **Swift** declined by 65%. Of the regional trends produced for **Mallard**, the increase has been greatest in the North East (85%).

YORKSHIRE

Fifty-five trends calculated, 31 were significant: 20 increases and 11 declines. **Greylag Goose** increased by 727% and **Grey Partridge** declined by 70%. Yorkshire is the only region where **Red Grouse** and **Snipe** reach the reporting threshold.

EAST MIDLANDS

Fifty-five trends calculated, 27 were significant: 18 increases and 9 declines. **Chiffchaff** increased by 416% and **Cuckoo** declined by 86%. Of the regional trends produced for **Green Woodpecker**, the increase has been greatest in the East Midlands (221%).

EAST OF ENGLAND

Sixty-eight trends calculated, 44 were significant: 23 increases and 21 declines. **Chiffchaff** increased by 136% and **Turtle Dove** declined by 93%. The East of England is the only region where **Shelduck** and **Corn Bunting** reach the reporting threshold.

WEST MIDLANDS

Fifty-two trends calculated, 32 were significant: 19 increases and 13 declines. **Goldfinch** increased by 222% and **Cuckoo** declined by 75%. Of the regional trends produced for **Song Thrush**, the increase has been greatest in the West Midlands (94%).

SOUTH EAST

Sixty-eight trends calculated, 46 were significant: 21 increases and 25 declines. **Red Kite** increased by 10,584% and **Turtle Dove** declined by 95%. The South East is the only region where **Tufted Duck**, **Red Kite** and **Marsh Tit** reach the reporting threshold.

SOUTH WEST

Sixty trends calculated, 32 were significant: 19 increases and 13 declines. **Great Spotted Woodpecker** increased by 128% and **Cuckoo** declined by 78%. The South West is the only region where **Raven** and **Grey Wagtail** reach the reporting threshold.

LONDON

Twenty-seven trends calculated, of which 21 were significant: 14 increases and 7 declines. **Goldfinch** increased by 412% and **House Sparrow** declined by 73%. Of the regional trends produced for **Great Tit** (108%) and **Chaffinch** (88%), the increases have been greatest in the London region.

Table 8 Counties in each region and squares covered in 2016

	Region	Counties	Squares covered in 2016
1	North West	Cheshire, Cumbria, Lancashire, Greater Manchester, Merseyside	269
2	North East	Cleveland, County Durham, Northumberland	116
3	Yorkshire & Humber	East Yorkshire, North Lincolnshire, North Yorkshire, South Yorkshire, West Yorkshire	296
4	East Midlands	Derbyshire, Northamptonshire, Leicestershire & Rutland, Lincolnshire, Nottinghamshire	298
5	East of England	Bedfordshire, Cambridgeshire, Essex, Hertfordshire, Norfolk, Suffolk	381
6	West Midlands	Birmingham, Herefordshire, Shropshire, Staffordshire, Warwickshire, Worcestershire	237
7	South East	Berkshire, Buckinghamshire, Hampshire, Isle of Wight, Kent, Oxfordshire, Surrey, Sussex	666
8	South West	Avon, Cornwall, Devon, Dorset, Gloucestershire, Somerset, Wiltshire	495
9	London	Greater London	106

FIND OUT MORE...

English regions:

More detailed information is available on the BBS webpages under '*Latest Results*', including short-term trends (2015–16) and trend graphs.

(www.bto.org/bbs)

Table 9 Trends in English regions during 1995–2015

Species	North West		North East		Yorkshire		East Midlands		East of England		West Midlands		South East		South West		London	
Mute Swan									**27**	42			**-1**	57	**39**	36		
Greylag Goose					**727** *	38			**94** *	46			**126** *	37				
Canada Goose	**104** *	71			**143** *	33	**62** *	43	**46**	59	**4**	71	**32**	118	**98** *	49		
Shelduck									**19**	36								
Mallard	**23** *	160	**85** *	33	**34** *	106	**14**	107	**-4**	193	**81** *	119	**33**	239	**45** *	155	**-20**	43
Tufted Duck													**75**	30				
Red-legged Partridge					**17**	52	**-48** *	78	**-21** *	180	**14**	36	**81** *	122	**120** *	59		
Red Grouse					**24**	50												
Grey Partridge					**-70** *	30	**-32**	32	**-53** *	43			**-79** *	30				
Pheasant	**138** *	144	**31**	71	**64** *	149	**5**	156	**-16** *	277	**68** *	142	**18** *	393	**56** *	276		
(Cormorant)									**-19**	48			**55**	48	**-19**	32		
(Grey Heron)	**-26** *	80			**-14**	36	**-13**	51	**-42** *	83	**4**	59	**-18**	124	**-12**	82		
Red Kite													**>10,000***	67				
Sparrowhawk	**-46** *	33							**-18**	47			**-20**	67	**0**	49		
Buzzard	**99** *	76			**>10,000**	36	**>10,000**	55	**>10,000**	64	**201** *	99	**1092***	167	**13**	228		
Moorhen	**-15**	70			**14**	40	**-25**	60	**-18**	126	**-19**	61	**-28** *	144	**-2**	68		
Coot	**-13**	31							**-12**	39	**78**	30	**29**	65				
Oystercatcher	**-1**	61			**244** *	47			**88** *	33								
Lapwing	**-27** *	115	**-22**	46	**4**	110	**-19**	63	**-28** *	74	**-22**	40	**-57** *	102				
Curlew	**-49** *	93	**-36** *	50	**4**	114												
Snipe					**53**	38												
Feral Pigeon	**-32**	76			**-46** *	60	**-44** *	49	**-34** *	76	**-44** *	43	**-22**	109	**-37** *	67	**-24** *	73
Stock Dove	**92** *	58			**45**	54	**-14**	76	**-5**	143	**71** *	86	**35** *	203	**25**	128		
Woodpigeon	**80** *	220	**19**	84	**90** *	171	**24**	194	**34** *	324	**26** *	184	**23** *	489	**47** *	350	**56** *	82
Collared Dove	**16**	134	**-12**	33	**-25** *	81	**18**	112	**48** *	210	**-35** *	117	**-6**	296	**0**	192	**-10**	52
Turtle Dove									**-93** *	61			**-95** *	44				
Cuckoo	**-42** *	34			**-51** *	43	**-86** *	49	**-74** *	106	**-75** *	53	**-70** *	162	**-78** *	74		
Swift	**-57** *	109	**-65** *	32	**-42** *	85	**-28**	81	**-32** *	151	**-49** *	75	**-55** *	169	**-61** *	142	**-54** *	58
Green Woodpecker							**221** *	47	**121** *	171	**46**	65	**25** *	311	**4**	131	**46** *	31
Gt Spotted Woodpecker	**91** *	90			**87** *	49	**153** *	63	**66** *	149	**151** *	108	**84** *	310	**128** *	165	**53** *	38
Kestrel	**-32** *	72			**-41** *	59	**-9**	64	**-16**	108	**-30** *	43	**-32** *	135	**-41** *	77		
Ring-necked Parakeet													**690** *	32			**>10,000**	42
Magpie	**-8**	187	**-9**	35	**-21**	100	**24**	145	**29** *	244	**-8**	163	**8**	417	**-7**	291	**36** *	81
Jay	**41**	71					**2**	31	**28** *	118	**-10**	63	**-9**	235	**1**	109	**-14**	40
Jackdaw	**71** *	145	**1**	62	**67** *	119	**125** *	122	**128** *	224	**80** *	141	**72** *	373	**40** *	273		
Rook	**-27**	91	**-28** *	48	**-37** *	109	**5**	97	**5**	180	**-10**	88	**4**	252	**-24** *	219		
Carrion Crow	**45** *	228	**-3**	82	**48** *	176	**40** *	182	**91** *	301	**5**	182	**21** *	473	**10**	345	**46** *	82
Raven															**125**	72		
Goldcrest	**77** *	45	**94**	30					**73** *	74	**105** *	46	**32** *	196	**-10**	131		
Blue Tit	**-11**	207	**-13**	64	**1**	151	**30** *	179	**22** *	302	**-10**	182	**-5**	476	**-9**	333	**13**	81
Great Tit	**30** *	193	**61** *	57	**56** *	132	**45** *	166	**16** *	287	**13**	176	**11** *	464	**39** *	323	**108** *	76
Coal Tit	**34**	72	**30**	41	**74** *	45	**0**	39	**9**	64	**51** *	50	**-9**	150	**4**	102		
Marsh Tit													**-40** *	52				
Skylark	**-22**	122	**-28** *	70	**4**	150	**-22** *	157	**-27** *	277	**-22** *	116	**-29** *	315	**-26** *	221		
Swallow	**-1**	200	**9**	75	**4**	160	**80** *	151	**10**	227	**4**	146	**15**	323	**32** *	298		
House Martin	**8**	99			**4**	68	**37**	58	**-39** *	99	**-38** *	82	**-60** *	145	**-23** *	149		
Long-tailed Tit	**12**	86			**44**	52	**52** *	79	**27** *	152	**-18**	89	**-23** *	245	**33** *	148	**78** *	33
Chiffchaff	**370** *	106	**286** *	43	**306** *	78	**416** *	101	**136** *	208	**158** *	143	**57** *	374	**37** *	292	**144** *	33
Willow Warbler	**-2**	150	**-33** *	68	**1**	118	**-58** *	93	**-81** *	114	**-52** *	90	**-78** *	151	**-60** *	153		
Blackcap	**204** *	119	**61** *	42	**115** *	90	**108** *	122	**97** *	242	**123** *	139	**107** *	391	**128** *	277	**171** *	46
Garden Warbler	**-31**	30					**-41**	33	**-34** *	59	**-24** *	45	**-40** *	98	**-21**	63		
Lesser Whitethroat							**5**	35	**24**	75			**-29** *	56	**-19**	41		
Whitethroat	**21**	89	**44** *	40	**13**	83	**92** *	137	**12**	249	**28** *	108	**50** *	298	**22** *	209		
Sedge Warbler									**-28**	45			**-12**	34	**-12**	33		
Reed Warbler									**-5**	40			**-21**	33				
Nuthatch	**376** *	43							**116** *	31	**153** *	52	**48** *	187	**71** *	87		
Treecreeper									**4**	30			**-5**	94	**-2**	50		
Wren	**60** *	218	**33** *	78	**34** *	176	**34** *	184	**31** *	298	**29** *	178	**12** *	466	**15** *	342	**42** *	76
Starling	**-53** *	175	**-47** *	59	**-61** *	121	**-47** *	132	**-51** *	231	**-66** *	132	**-65** *	332	**-72** *	193	**-57** *	79
Blackbird	**41** *	218	**22**	73	**43** *	168	**33** *	191	**3**	316	**32** *	184	**1**	488	**20** *	351	**-28** *	82
Song Thrush	**59** *	168	**4**	63	**54** *	115	**35** *	137	**-1**	237	**94** *	155	**-6**	424	**17** *	292	**-35** *	51
Mistle Thrush	**-19**	121	**-8**	40	**-45** *	82	**-20**	84	**-54** *	134	**-1**	89	**-56** *	227	**-47** *	126	**-53** *	34
Robin	**39** *	209	**50** *	71	**60** *	148	**27**	179	**26** *	296	**44** *	182	**14** *	472	**18** *	338	**84** *	79
Wheatear	**-31**	53			**3**	47												
Dunnock	**27** *	182	**23**	59	**2**	128	**9**	169	**25** *	272	**35** *	168	**5**	421	**18**	311	**29** *	62
House Sparrow	**-9**	161	**-29**	44	**-8**	98	**-1**	121	**-33** *	197	**-8**	143	**-31** *	304	**5**	233	**-73** *	69
Tree Sparrow	**127** *	31			**226** *	41	**11**	34										
Yellow Wagtail							**-42** *	37	**-41** *	48								
Grey Wagtail															**-22**	31		
Pied Wagtail	**-13**	132	**20**	49	**0**	104	**-19**	96	**1**	151	**7**	87	**-17** *	201	**-3**	152		
Meadow Pipit	**-1**	93	**-6**	55	**16**	105	**-44** *	41	**-55** *	42			**-45** *	49	**-13**	49		
Chaffinch	**0**	218	**10**	82	**30** *	174	**22** *	189	**10** *	315	**-34** *	180	**-18** *	476	**-15** *	346	**88** *	57
Bullfinch	**-12**	42					**30**	51	**-10**	65	**21**	55	**-28** *	134	**6**	109		
Greenfinch	**-38** *	155	**-43** *	44	**-42** *	103	**-39** *	138	**-33** *	250	**-31** *	141	**-52** *	374	**-54** *	267	**-28**	60
Linnet	**-27**	94	**-31**	49	**-16**	95	**-25**	117	**-14**	172	**-29**	75	**-32** *	224	**-16**	180		
Goldfinch	**145** *	167	**119** *	53	**150** *	122	**172** *	135	**81** *	213	**222** *	129	**66** *	329	**96** *	264	**412** *	50
Yellowhammer	**-29** *	55	**-46** *	43	**-20** *	87	**-3**	136	**-19** *	219	**-47** *	104	**-41** *	248	**-18** *	164		
Reed Bunting	**9**	65			**70**	45	**71** *	62	**35** *	81			**-32** *	60	**34**	34		
Corn Bunting									**-33** *	39								

Background, methods and recent papers

BACKGROUND AND METHODS

The BBS was launched, in 1994, to provide more representative habitat and geographical coverage than the main survey running at the time, the Common Birds Census (CBC). The CBC ended in 2000, and the overlap period between 1994 and 2000 allowed BTO to develop methods for calculating long-term trends (from the 1960s to the present) using information from both schemes.

The BBS is a line-transect survey based on randomly located 1-km squares. Squares are chosen through stratified random sampling, with more squares in areas with more potential volunteers. The difference in sampling densities is taken into account when calculating trends. BBS volunteers make two early-morning visits to their square during the April–June survey period, recording all birds encountered while walking two 1-km transects across their square. Each 1-km transect is divided into five 200-m sections for ease of recording. Birds are recorded in three distance categories, or as 'in flight', in order to assess detectability and work out species density. To assess further the detectability of species the option of recording how birds were first detected (by song, call or visually) was introduced in 2014. Observers also record the habitat along the transects, and record any mammals seen during the survey. Surveying a BBS square involves around six hours of fieldwork per year, and the aim is for each volunteer to survey the same square (or squares) every year.

As BBS squares are selected randomly, they can turn up within any kind of habitat. Some squares can never be surveyed, and these truly 'uncoverable' sites are removed from the system. However, squares that are temporarily inaccessible, or which are not taken up due to their remote location, are retained in order to maintain the integrity of the sampling design.

The BBS National Organiser, based at BTO HQ, is responsible for the overall running of the scheme, and is the main point of contact for the network of volunteer Regional Organisers (ROs). ROs are responsible for finding new volunteers and allocating squares to observers in their region. At the end of the season they validate submissions made online, and collect paper submissions and return them to BTO HQ. We are very grateful for the assistance of the ROs.

The BBS provides reliable population trends for a large proportion of our breeding species. Trends can also be produced for specific countries, regions or habitats. For these analyses, we take the higher count from the two visits for each species, summed over all four distance categories and ten transect sections. Only squares that have been surveyed in at least two years are included in the analyses. Population changes are estimated using a log-linear model with Poisson error terms. Counts are modelled as a function of year and site effects, weighted to account for differences in sampling densities across the UK, with standard errors adjusted for overdispersion.

Since 2009, data from additional randomly selected 1-km squares surveyed as part of the Scottish Woodland BBS and the Upland BBS have been included in the BBS sample. These squares were surveyed using the same methodology as standard BBS squares, and results were incorporated into trends accounting for additional sampling effort. Since 2010, the option of adding an Upland Adjacent square to an existing 'Eligible Upland' BBS square has been encouraged, with the aim of increasing coverage in upland areas. These data are treated separately during the analyses.

Work has been carried out to assess the reliability of BBS trends, to ensure that reported trends are based on reliable data and sufficient sample sizes. This work has resulted in the following exclusions and caveats:

- We do not report population trends for five species of gull (Black-headed, Common, Lesser Black-backed, Herring and Great Black-backed), as a large proportion of the records are of non-breeding, wintering or migratory individuals.
- Trends for rare breeding species with substantial wintering populations (e.g. Fieldfare) are excluded.
- Trends for Cormorant, Grey Heron, Little Egret and Common Tern are reported with the caveat that counts may contain a high proportion of birds away from breeding sites.
- Trends for Tawny Owl and Barn Owl are reported with the caveat that the BBS monitors nocturnal species poorly.
- Counts for six wader species (Oystercatcher, Golden Plover, Lapwing, Snipe, Curlew and Redshank) are corrected to exclude counts from non-breeding flocks, and observations of Golden Plover in habitat unsuitable for breeding are also excluded.

CURLEW: GRAHAM CATLEY

PUBLISHED AND FORTHCOMING PAPERS...

Franks, S.E., Douglas, D.J.T., Gillings, S. & Pearce-Higgins, J.W. (in press) Environmental correlates of breeding abundance and population change of Eurasian Curlew *Numenius arquata* in Britain. ***Bird Study.***

Stanbury, A., Brown, A., Eaton, M., Aebischer, N., Gillings, S., Hearn, R., Noble, D., Stroud, D. & Gregory, R. (in press) An assessment of the risk of extinction for birds in Great Britain. ***British Birds.***

Sullivan, M.J.P., Pearce-Higgins, J.W., Newson, S.E., Scholefield, P., Brereton, T. & Oliver, T.H. (in press) A national-scale model of linear features improves predictions of farmland biodiversity. ***Journal of Applied Ecology.***

Elston, D.A., Brewer, M.J., Martay, B., Johnston, A., Henrys, P.A., Bell, J.R., Harrington, R., Monteith, D., Brereton, T.M., Boughey, K.L. & Pearce-Higgins, J.W. (in press) A new approach to modelling the relationship between annual population abundance indices and weather data. ***Journal of Agricultural, Biological and Environmental Statistics.***

Morrison, C.A., Robinson, R.A., Butler, S. Clark, J.A. & Gill, J.A. 2016. Demographic drivers of decline and recovery in an Afro-Palaearctic migratory bird population. ***Proceedings of the Royal Society B*** 283: 20161387.

Further reading

Robinson, R.A., Leech, D.I., Massimino, D., Woodward, I., Eglington, S.M., Marchant, J.H., Sullivan, M.J.P., Barimore, C., Dadam, D., Hammond, M.J., Harris, S.J., Noble, D.G., Walker, R.H. & Baillie, S.R. 2016. *BirdTrends 2016: trends in numbers, breeding success and survival for UK breeding birds.* Research Report 691. BTO, Thetford. (www.bto.org/birdtrends)

Hayhow, D.B., Bond, A.L., Douse, A., Eaton, M.A., Frost, T., Grice, P.V., Hall, C., Harris, S.J., Havery, S., Hearn, R.D., Noble, D.G., Oppel, S., Williams, J., Win, I. & Wotton, S. 2017. *The state of the UK's birds 2016.* RSPB, BTO, WWT, JNCC, NE, DAERA, NRW and SNH, Sandy, Bedfordshire. (www.bto.org/research-data-services/publications/state-uk-birds)

JNCC 2016. *Seabird Population Trends and Causes of Change: 1986–2015 Report.* Joint Nature Conservation Committee. (www.jncc.defra.gov.uk/page-3201)

Defra 2017. *Wild bird populations in the UK, 1970 to 2015.* (www.gov.uk/government/statistics/wild-bird-populations-in-the-uk)

PECBMS 2016. *Trends of common birds in Europe, 2016 update.* (www.ebcc.info/index.php?ID=612)

Mammal monitoring and population trends

Reeves' Muntjac increased by 104% in the UK between 1996 and 2015

Trends for nine mammal species – now including trends for countries as well as for the UK as a whole

Mammal data were collected on 3,452 of 3,837 BBS squares surveyed (90%) in 2016. This allows for population trends to be calculated for nine of the UKs most easily detected and widespread mammal species. Thank you to all who submit these data.

This optional recording during bird count visits provides valuable data on mammal distribution and population change. An example of the use of these data is given on pages 30–31.

FIFTY-THREE TRENDS

When considering the various scales for which mammal trends are produced, from UK down to English Regions, the total number of population trends calculated is 53. This provides an insight into how populations are changing in different areas of the UK (tables 11–16).

RECORD TYPES

Records include counts of live mammals, records of signs of presence, and local knowledge. If none of these were detected, a submission of a 'null return' (where no mammals or evidence of presence was found) is submitted: absence data can be as valuable as counts. Of the 3,452 squares for which mammal data were received, 2,883 had records of live mammals counted during the survey visit, 122 had indirect evidence only (local knowledge, field signs) and 447 squares had mammal recording, but no evidence of presence was established.

REEVES' MUNTJAC

Woodland birds and deer have featured strongly throughout this report. **Reeves' Muntjac** has increased more than any other mammal species reported by the BBS, with a trend of 104% between 1996 and 2015.

Two of the four deer species for which the trends can be calculated, **Fallow Deer** and **Reeves' Muntjac**, are non-native, and all four have increased at each regional scale (UK, country and English Region) since 1995 when the option of mammal recording was first introduced as an optional extra to the survey.

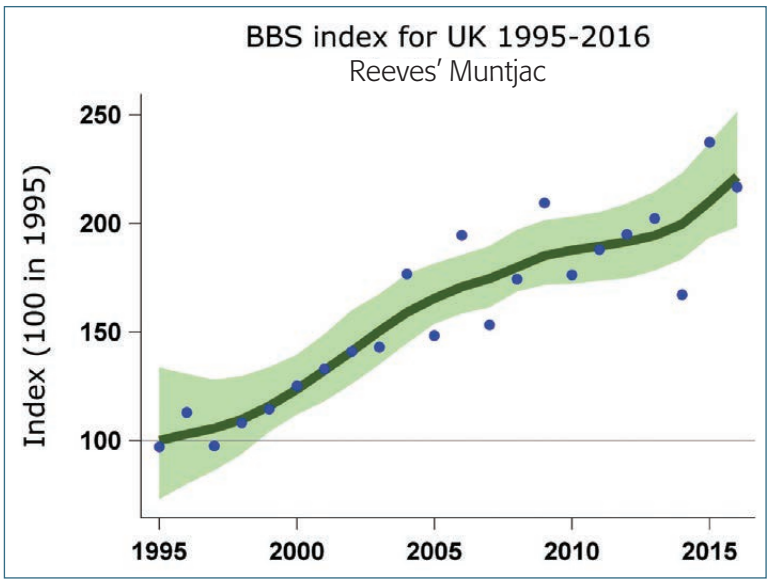


Table 10 All mammal species recorded in 2016

Species	Squares recorded
Red Squirrel	25
Grey Squirrel	1,045
European Beaver	1
Bank Vole	19
Short-tailed Vole	21
Water Vole	6
Harvest Mouse	2
Wood Mouse	17
Yellow-necked Mouse	1
House Mouse	5
Common Rat	55
Rabbit	1,957
Brown Hare	932
Mountain/Irish Hare	76
Hedgehog	50
Mole	529
Common Shrew	55
Pygmy Shrew	6
Lesser White-toothed Shrew	1
Noctule Bat	1
Soprano Pipistrelle	1
Pipistrelle Bat sp	6
Red Fox	487
Badger	314
Otter	26
Pine Marten	10
Stoat	35
Weasel	14
Polecat	2
American Mink	7
Common Seal	3
Grey Seal	9
Wild Boar	4
Reeves' Muntjac	201
Red Deer	114
Sika Deer	18
Fallow Deer	124
Roe Deer	819
Chinese Water Deer	11
Feral Goat	6
Park Cattle	4

▲ **Squares recorded**: number of squares on which species were recorded, including counts, field signs, dead animals and local knowledge.

REEVES' MUNTJAC: PAUL NEWTON

Table 11 Mammal trends in **UK** during 1996–2015

Species	*Scientific name*	Sample	96–15	LCL	UCL
Grey Squirrel	*Sciurus carolinensis*	736	**-9** *	-22	-3
Rabbit	*Oryctolagus cuniculus*	1,418	**-61** *	-68	-53
Brown Hare	*Lepus europaeus*	706	**-12** *	-20	-1
Mountain/Irish Hare	*Lepus timidus*	50	**-33**	-61	18
Red Fox	*Vulpes vulpes*	284	**-39** *	-49	-29
Reeves' Muntjac	*Muntiacus reevesi*	95	**104** *	36	196
Red Deer	*Cervus elaphus*	64	**14**	0	44
Fallow Deer	*Dama dama*	62	**13**	-5	37
Roe Deer	*Capreolus capreolus*	418	**64** *	42	91

Table 12 Mammal trends in **England** during 1996–2015

Species	*Scientific name*	Sample	96–15	LCL	UCL
Grey Squirrel	*Sciurus carolinensis*	657	**-10** *	-22	-4
Rabbit	*Oryctolagus cuniculus*	1,162	**-45** *	-52	-35
Brown Hare	*Lepus europaeus*	604	**-9**	-18	2
Red Fox	*Vulpes vulpes*	229	**-44** *	-53	-33
Reeves' Muntjac	*Muntiacus reevesi*	95	**104** *	31	219
Fallow Deer	*Dama dama*	58	**12**	-4	38
Roe Deer	*Capreolus capreolus*	323	**60** *	35	93

Table 13 Mammal trends in **Scotland** during 1996–2015

Species	*Scientific name*	Sample	96–15	LCL	UCL
Rabbit	*Oryctolagus cuniculus*	114	**-83** *	-89	-71
Brown Hare	*Lepus europaeus*	76	**-24**	-50	7
Red Deer	*Cervus elaphus*	43	**2**	-19	91
Roe Deer	*Capreolus capreolus*	94	**72** *	22	126

Table 14 Mammal trends in **Wales** during 1996–2015

Species	*Scientific name*	Sample	96–15	LCL	UCL
Grey Squirrel	*Sciurus carolinensis*	56	**9**	-35	63
Rabbit	*Oryctolagus cuniculus*	93	**-44** *	-59	-8

Table 15 Mammal trends in **Northern Ireland** during 1996–2015

Species	*Scientific name*	Sample	96–15	LCL	UCL
Rabbit	*Oryctolagus cuniculus*	44	**-29**	-61	3

MAMMAL TREND GRAPHS ONLINE:
www.bto.org/bbs-mammals

Table 16 Mammal trends in **English Regions** during 1996–2015

Species	North West		North East		Yorkshire		East Midlands		East of England		West Midlands		South East		South West		London	
Grey Squirrel	**66** *	58			**-31**	32	**37**	45	**-23** *	97	**-36** *	74	**-23** *	197	**12**	98	**28**	50
Rabbit	**-42** *	109	**-71** *	40	**-16**	113	**-81***	109	**-40** *	204	**-47** *	110	**-61** *	288	**-28**	178		
Brown Hare	**-42** *	62			**-9**	70	**37***	89	**-1**	145	**-23**	41	**-24**	100	**-20**	69		
Red Fox									**-21**	31			**-35** *	65	**-43** *	46		
Reeves' Muntjac									**104** *	45			**51**	32				
Roe Deer													**65** *	117	**39** *	98		

- Trends are expressed as the percentage change, and marked with an asterisk (*) where the 95% confidence limits of the change do not overlap zero (indicating that there has been a significant change).
- Trends for Red and Fallow Deer are reported with caveats. These are herding species and trends should be interpreted with caution, the presence or absence of a herd in a given BBS visit could influence the overall trend.
- The sample is the mean number of squares per year on which the species was recorded during 1995–2016.
- The trend since the start of the survey, covering the years 1995–2016, has been smoothed, and the end years truncated (figure in bold).
- LCL and UCL are the lower and upper 95% confidence limits for the 1996–2015 trend (displayed in Tables 11–15).

Red and Roe Deer in Scotland

90% of BBS squares now **record mammal data** during bird surveys

Using BBS mammal data to help inform deer management in Scotland

By **Sarah Harris**, BBS National Organiser, BTO

Mammal data are now recorded on 90% of all BBS squares and this allows the 'standard' population trends to be calculated annually for the UK, countries and English Regions, but their uses go further than that: research!

THE MISSION

BTO were approached by Scottish Natural Heritage (SNH) in 2016 to assist with a review they were conducting for Scottish Government into the effectiveness of deer management in Scotland. Information on the abundance and trends of **Red** and **Roe Deer** was required.

THE METHODS

Count data for **Red** and **Roe Deer** were used to estimate abundance and change in abundance across Scotland. Using statistical modelling it was possible to combine the count information with land-cover data to 'fill in the gaps' between BBS squares, smoothing abundance estimates across the country. The smoothing effect does not take into account the abrupt changes in abundance caused by barriers, such as the sea, which can prevent mammal presence even when close to populations just over the water. Deer presence on some island groups were accounted for by removal of predictions of absent species from both Western and Northern Isles. However, assumed presence on some of the smaller inner isles, where in fact one or other species is absent, was not corrected. Another difficulty was faced when attempting to model abundance on islands, where BBS squares may be too few to interpolate from. Abundance was calculated for 1995–99 and 2012–15; the two periods were then compared, giving abundance change over time for **Red Deer** and **Roe Deer** in turn.

THE RESULTS

Four maps were produced, all of which are displayed on the page opposite. The abundance maps show predicted abundance in the later years (2012–15) at a 1-km resolution. The darker colours correspond to higher abundance (expressed as the number of deer we would expect to count in a 1-km square if the square was surveyed following the BBS procedure).

The abundance change maps show information about changes in abundance from 1995–99 and 2012–15 at a 10-km resolution. The map presents two different pieces of information, using combinations of dot colour and size. Colour shows the relative change in abundance, with blue colours showing increase and red colours showing decline. Grey colours indicate little or no change. The relative change is simply the proportional change in abundance between the two time frames. Dot size indicates the mean abundance of that species across both periods, so that locations with large dots were estimated to contain more deer than those with small dots.

The SNH report itself, concluded that deer are an important part of Scotland's natural heritage but also recognised their impacts. The impacts of deer and success of deer management was reported to vary across the country and the report advised that there is more to do when looking into deer management and highlighted the importance of working alongside the Deer sector. As with any conservation implementation, or indeed species management, it is crucial that current data are examined and facts recognised then used to inform decisions in an unbiased manner, as demonstrated by this report.

THE CAVEAT

The spatial models used to make these maps involve assumptions – so errors can arise, especially in areas of low BBS coverage. It is better to concentrate on the big picture than look at individual squares. With time and increased coverage of BBS squares recording mammal data, these predictions could be improved.

THANK YOU

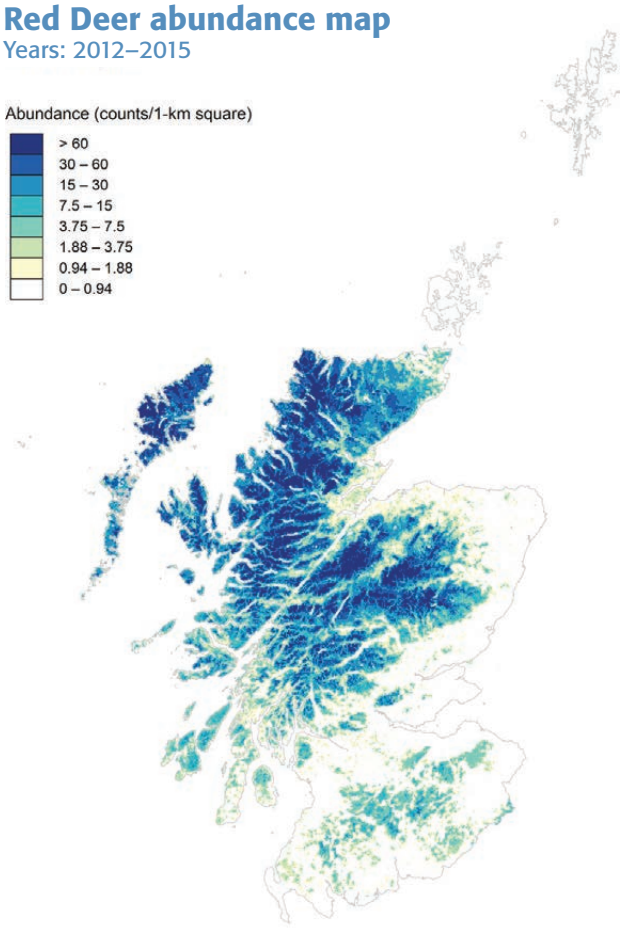
Many thanks to all the volunteers opting to record mammals and signs of mammal on their BBS squares, enabling informed decision making.

FIND OUT MORE...

Deer Management in Scotland: Report to the Scottish Government from Scottish Natural Heritage 2016
www.snh.gov.uk/publications-data-and-research/publications/search-the-catalogue/publication-detail/?id=2449

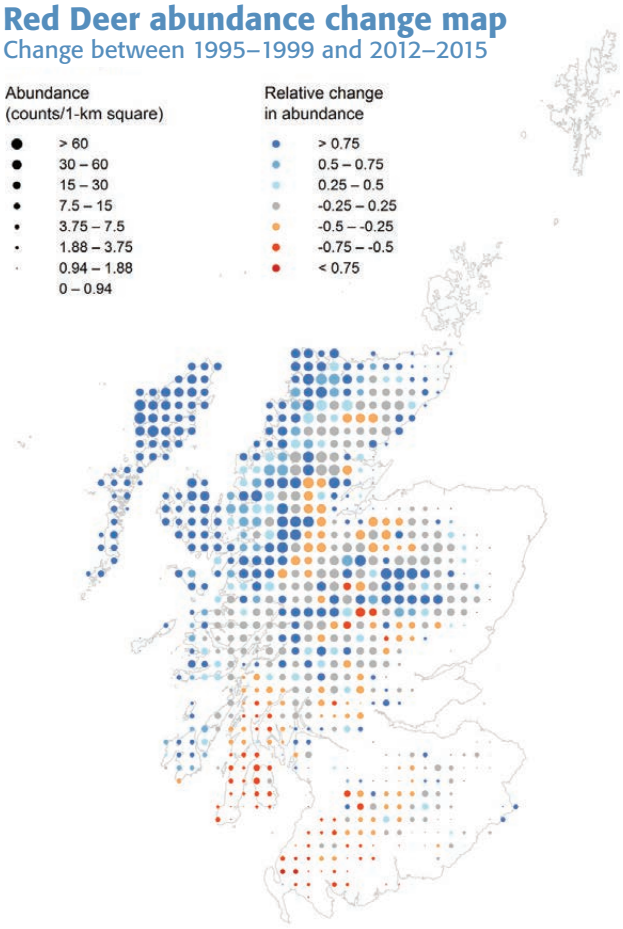
Red Deer abundance map

Years: 2012–2015



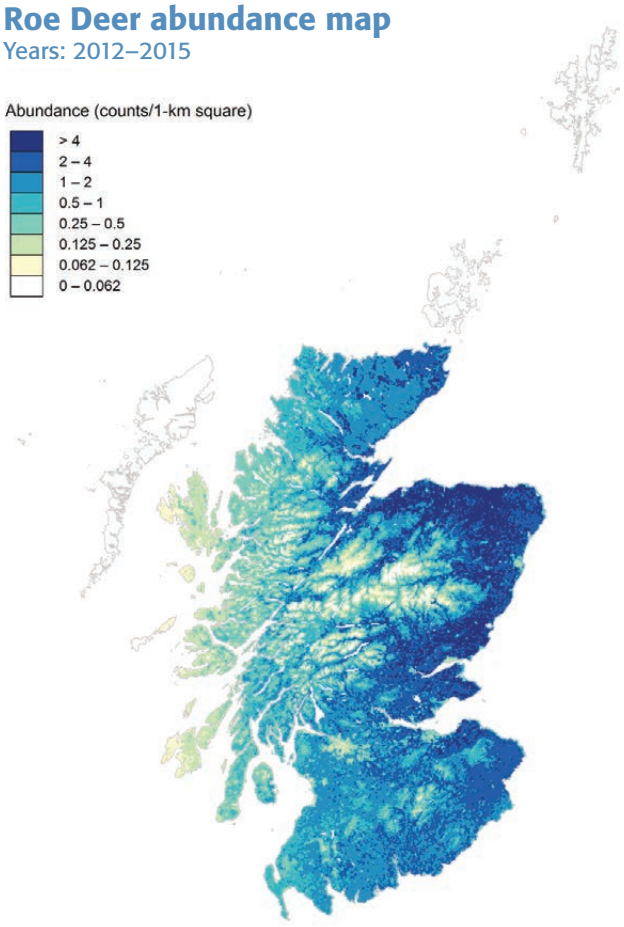
Red Deer abundance change map

Change between 1995–1999 and 2012–2015



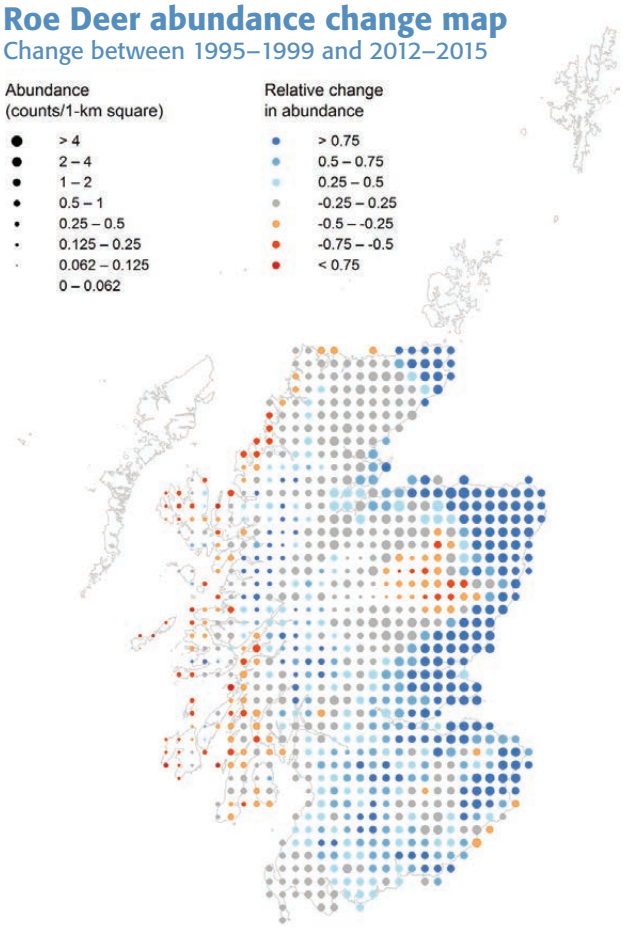
Roe Deer abundance map

Years: 2012–2015



Roe Deer abundance change map

Change between 1995–1999 and 2012–2015



WBBS: BBS-style transects along waterways

The Waterways Breeding Bird Survey, previously managed and funded by BTO, with the financial assistance of the Environment Agency, is now part of the new BTO/JNCC/RSPB Breeding Bird Survey agreement.

The WBBS, started in 1998, is a survey specifically designed to monitor birdlife along rivers and canals. This focus complements the multi-habitat approach of the Breeding Bird Survey.

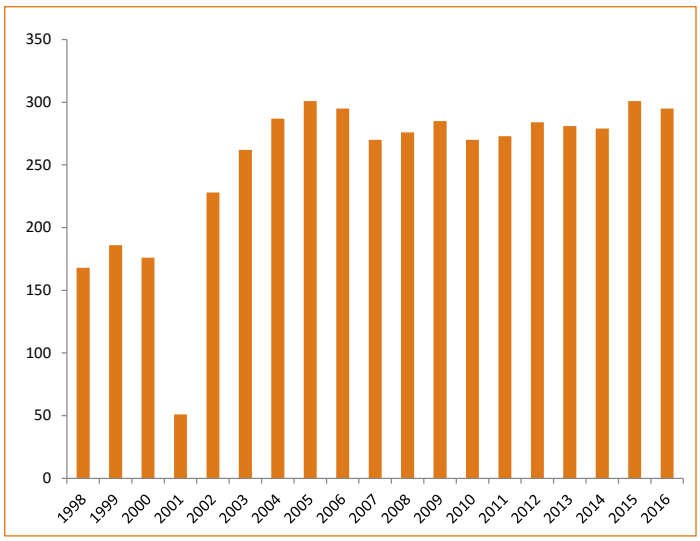
METHOD AND PURPOSE

Methods are similar to the Breeding Bird Survey, but there are some differences. Rather than two 1-km long parallel transect routes, divided into 200-m sections, the WBBS runs as one long transect, alongside a waterway, and with sections being 500-m long. Each WBBS stretch can range in length from a single 500-m section to a 5-km stretch.

The survey is especially valuable for monitoring the population trends of species strongly associated with linear waterways, such as **Goosander**, **Grey Wagtail, Dipper**, **Water Vole**, **Otter** and **American Mink**.

Last year's BBS report carried an introduction to WBBS, for those who may not have come across this survey before. With WBBS now being part of the BTO/JNCC/RSPB Breeding Bird Survey agreement, it was decided that the results should be published alongside the BBS outputs.

Figure 1 Numbers of WBBS stretches covered have been fairly consistent over the years, with the exception of the foot-and-mouth year of 2001.



DATA ENTRY

WBBS data are entered via the BBS Online facility and stored in a similar fashion. Data are collected during the same survey period as the BBS and should be entered into the system by the end of August to allow data checking and analysis to take place as soon as possible after the survey period.

Of the 295 stretches surveyed, 87% are submitted via the BBS Online system. The remainder are sent in on paper and entered in-house. Either way, the data are much appreciated and a big thanks goes out to all those contributing to the survey.

LOOKING AHEAD

Until recently it has not been possible to allocate new WBBS stretches to the set available to volunteers. This has limited the number of stretches available and therefore prevented the survey from growing further. With the new BBS agreement comes the opportunity to research new methods of selecting random WBBS stretches, without biasing the areas included in the set, as well as reporting back in this report on the population trends for species of this specific habitat type.

▲ Share Waterways Breeding Bird Survey news and photos on Twitter using the hashtag #_WBBS and tagging @BBS_birds.

COVERAGE

Two hundred and sixty-one volunteers surveyed 295 WBBS stretches in 2016. This is a slight drop from 301 in 2015, but longer term, coverage looks stable (see figure 1). The map below illustrates the distribution of coverage, with the locations of WBBS stretches as purple dots.

Volunteers covered up to three stretches for the survey and recorded an impressive 173 bird species.

Species recorded include the most numerous such as **Wren**, **Chaffinch**, **Woodpigeon** and **Robin**, through to the more unusual species such as **Goshawk**, **Great White Egret** and **Water Pipit**.

GREY WAGTAIL, DIPPER & COMMON SANDPIPER: EDMUND FELLOWES, OYSTERCATCHER: JILL PAKENHAM

United Kingdom – WBBS population trends

Lapwing declined by 54% along UK waterways between 1999 and 2015

Twenty-four trends have been produced for a selection of species associated with waterways, and for which robust trends can be calculated using the data available. These trends provide an indication of the health of bird populations in this habitat type in particular, rather than for all UK habitat types overall, as is the case for the standard Breeding Bird Survey trends.

STATISTICALLY SIGNIFICANT RESULTS

Period	No. species	Greatest change	
Long-term (99–15) increases	1	Whitethroat:	25%
Long-term (99–15) declines	7	Lapwing:	-54%
Short-term (15–16) increases	3	Sand Martin	43%
Short-term (15–16) declines	1	Mallard	-9%

WORRIES AT WATERWAYS

Of the twenty-four long-term trends produced for the WBBS, eight have statistically significant changes, seven of which are declines. Considering all the long-term trends, four were indicating increases and 20, declines.

DIVING DEEPER

Generally, declines detected in WBBS trends are greater than those revealed by the Breeding Bird Survey which by comparing the two population trends (BBS and WBBS), clues may be unravelled as to why trends for certain species are changing. Is it something to do with waterways, such as water quality, food or adjacent habitat?

LAPWING LOSSES

Declines in **Lapwing** are evident from the BBS results – 43% between 1995 and 2015 – and in waterways specifically as monitored by WBBS, showing a slightly greater decline of 54% from 1999 to 2015.

During the 1980s, agricultural intensification was identified as a key driver of decline, with drainage of farmland, increased use of fertilisers and pesticides, earlier and more frequent mowing, increased grazing pressures and a less varied agricultural landscape to cater for nesting and foraging requirements all playing a part. In the uplands, afforestation has been identified as reducing suitable habitat for **Lapwing**. Conservation and management measures, such as under agri-environment schemes, have failed to date to reverse the negative effects of modern agriculture on **Lapwing** at the national scale.

MOORHEN

WBBS shows a 23% decline in **Moorhen** from 1999 to 2015. This is similar to the BBS trend (-12%). **Moorhen** is susceptible to harsh winters and year-to-year fluctuations can be expected. Reasons behind the long-term declines are poorly understood, but the spread of non-native **American Mink**, an important predator, especially along waterways, has been identified as a possible driver.

This highlights the value of recording mammals during WBBS visits, providing scope for future research on the possible impact along waterways, of species such as **American Mink**.

MIGRATION IN THE MIX

For species which nest along waterways, but spend the winter months elsewhere, identifying the reasons for decline becomes that much more complex. **Common Sandpiper** and **Sedge Warbler** have undergone declines between 1999 and 2015, along waterways, of 28% and 45% respectively.

Both migrate; **Common Sandpiper** to West Africa, and **Sedge Warbler** to south of the Sahara, in the West African Sahel. Therefore, populations may be influenced during migration, when at wintering locations or here, on UK waterways. Previous research has shown how low rainfall levels in the Sahel, prior to **Sedge Warbler** arrival, can have a significant impact on overwinter survival. This can help explain annual fluctuations seen in the BBS population trends, but the continued, long-term decline revealed by the WBBS requires further research.

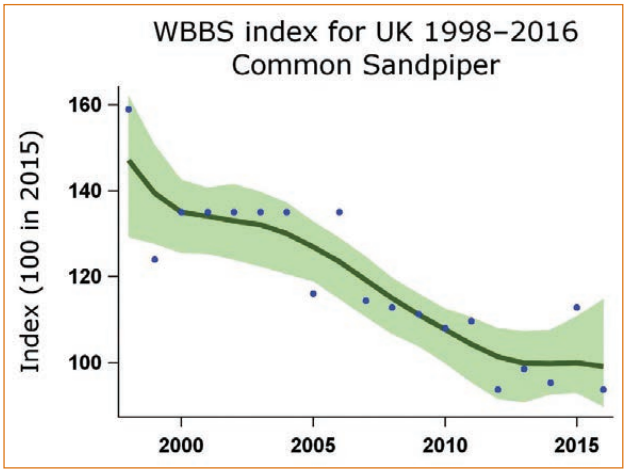


Table 17 WBBS UK population trends during 2015–16 and 1999–2015

Species	Sample	15–16	99–15	LCL	UCL
Mute Swan	111	-13	-12	-34	20
Greylag Goose	52	-51	73	-10	223
Canada Goose	97	24 *	64	-4	166
Mallard	232	-9 *	-1	-11	12
Tufted Duck	44	-24	-35	-61	24
Goosander	53	-11	16	-21	59
(Cormorant)	67	15	-1	-26	37
(Grey Heron)	174	-12	-30 *	-40	-17
Moorhen	147	-4	-23 *	-35	-10
Coot	70	-2	-24	-51	6
Oystercatcher	76	6	-35 *	-48	-17
Lapwing	82	-9	-54 *	-70	-32
Curlew	62	11	-47 *	-62	-28
Common Sandpiper	69	-15	-28 *	-40	-14
(Common Tern)	31	-14	-11	-40	35
Kingfisher	71	23	-19	-39	2
Sand Martin	76	43 *	-5	-47	68
Grey Wagtail	128	9	-9	-24	10
Pied Wagtail	156	-9	-23	-37	-2
Dipper	91	3	-10	-29	16
Sedge Warbler	91	2	-45 *	-56	-32
Reed Warbler	56	15 *	-11	-30	13
Whitethroat	127	-4	25 *	6	46
Reed Bunting	112	2	-3	-16	10

LAPWING: HOWARD STOCKDALE

Species	Sample
Shelduck	26
Redshank	22
Mandarin	22
Great Crested Grebe	21
Snipe	21
Gadwall	20
Little Grebe	16
Marsh Tit	14
Grasshopper Warbler	13
Little Egret	12
Cetti's Warbler	9

▲ **Table 18**: Additional species of interest for WBBS but for which sample size is currently just too low to calculate robust trends from the survey.

SPECIAL THANKS

As is the case with the Breeding Bird Survey (see back cover), the Waterways Breeding Bird Survey also relies on the dedication and enthusiasm of Regional Organisers (RO) who manage the survey locally. Without these volunteers, it would not be possible to manage such large surveys and we are in debt to them all.

The back covers shows a complete list of the ROs who manage the Breeding Bird Survey locally; many of these ROs also manage the WBBS. Please see opposite for the list of those WBBS Regional Organisers who focus solely on managing WBBS locally (and are therefore not listed on the back page). Regions without a WBBS RO have been marked as 'vacant'. Please do email wbbs@bto.org if you would like to find out more about becoming a Regional Organiser and what is involved.

Once again, a huge thanks goes out to all the Regional Organisers, volunteers and landowners who enable this survey to be the success it is. Thank you all.

WBBS Regional Organisers in 2016:

ENGLAND	
Huntingdon & Peterborough	Derek Langslow
Lancashire (North-West)	**VACANT**
Staffordshire (North and West)	Scott Petrek
Worcestershire	Steve Davies
SCOTLAND	
Lanark, Renfrew & Dunbarton	**VACANT**
NORTHERN IRELAND	
Antrim & Belfast	Michael Stinson
Armagh	Michael Stinson
Down	Michael Stinson
Londonderry	Michael Stinson

▲ WBBS Regional Organisers not listed on the back cover of this report. For any regions not listed, the RO is also the BBS Regional Organiser and mentioned on the back cover.

INTERPRETING THE RESULTS: see page 13

RESULTS ONLINE:
www.bto.org/volunteer-surveys/wbbs/results

SPECIAL THANKS

We would like to thank all surveyors and ROs for making the BBS the success it is today. Space does not permit all observers to be acknowledged individually here, but we would especially like to thank the ROs for their efforts.

BBS Regional Organisers in 2016:

ENGLAND

Avon	Dave Stoddard
Bedfordshire	Judith Knight
Berkshire	Sarah & Ken White
Birmingham & West Midlands	Steve Davies
Buckinghamshire	Phil Tizzard
Cambridgeshire	Rob Pople
Cheshire (Mid)	Paul Miller
Cheshire (North-East and South)	Hugh Pulsford
Cleveland	Vic Fairbrother
Cornwall	Peter Kent (now Michael Williams)
Cumbria	Colin Gay with Stephen Westerberg & Dave Piercy
Derbyshire (North, South)	Dave Budworth
Devon	Stella Beavan
Dorset	Claire Young
Durham	David Sowerbutts
Essex (North-East)	Rod Bleach
Essex (North-West)	Graham Smith
Essex (South)	Terry Coster (now **VACANT**)
Gloucestershire	Gordon Kirk
Hampshire	Glynne Evans
Herefordshire	Chris Robinson
Hertfordshire	Martin Ketcher
Huntingdon & Peterborough	Mick Twinn
Isle of Wight	Jim Baldwin
Isles of Scilly	Will Wagstaff
Kent	Geoff Orton
Lancashire (East)	Tony Cooper
Lancashire (North-West)	Jerry Martin
Lancashire (South)	**VACANT**
Leicestershire & Rutland	Dave Wright
Lincolnshire (East)	Phil Espin
Lincolnshire (North)	Chris Gunn
Lincolnshire (South)	Hugh Dorrington
Lincolnshire (West)	Peter Overton (now Mike Daly)
London (North)	**VACANT**
London (South)	Richard Arnold
Manchester	Nick Hilton
Merseyside	Bob Harris
Norfolk (North-East)	Chris Hudson
Norfolk (North-West)	Bob Osborne
Norfolk (South-East)	Rachel Warren
Norfolk (South-West)	Vince Matthews
Northamptonshire	Barrie Galpin
Northumberland	Muriel Cadwallender
Nottinghamshire	Lynda Milner
Oxfordshire (North)	Frances Buckel
Oxfordshire (South)	John Melling
Shropshire	Jonathan Groom
Somerset	Eve Tigwell
Staffordshire (North, South, West)	Gerald Gittens
Suffolk	Mick Wright
Surrey	Penny Williams
Sussex	Helen Crabtree
The Wirral	Paul Miller
Warwickshire	Mark Smith
Wiltshire (North, South)	Bill Quantrill
Worcestershire	Harry Green
Yorkshire (Bradford)	Mike Denton
Yorkshire (Central)	Mike Brown
Yorkshire (East, Hull)	Geoff Dobbs
Yorkshire (Leeds & Wakefield)	**VACANT**
Yorkshire (North-East)	Graham Oliver
Yorkshire (North-West)	Gerald Light
Yorkshire (Richmond)	Mike Gibson
Yorkshire (South-East)	Aidan Gill
Yorkshire (South-West)	Grant Bigg
Yorkshire (York)	Rob Chapman

SCOTLAND

Aberdeen	Moray Souter
Angus	Peter Ellis
Argyll (Mull, Coll, Tiree & Morven)	Geoff Small
Argyll (mainland & Gigha) & Bute	Nigel Scriven
Arran	James Cassels
Ayrshire	Brian Broadley
Benbecula & The Uists	Yvonne Benting
Borders	Dave McGarvie
Caithness	Donald Omand
Central	Neil Bielby
Dumfries	Andy Riches
Fife & Kinross	Norman Elkins
Inverness (East & Speyside, West)	Hugh Insley
Islay, Jura & Colonsay	David Wood
Kincardine & Deeside	Graham Cooper
Kirkcudbright	Andrew Bielinski
Lanark, Renfrew & Dunbarton	Andy Winnington
Lewis & Harris	Chris Reynolds
Lothian	Alan Heavisides
Moray & Nairn	Melvin Morrison
Orkney	Colin Corse
Perthshire	Mike Bell
Rhum, Eigg, Canna & Muck	Bob Swann
Ross-shire	Simon Cohen
Shetland	Dave Okill
Skye	Carol Hawley
Sutherland	Bob Swann
Wigtown	Geoff Sheppard

WALES

BTO Wales Officer	John Lloyd
Anglesey	Ian Hawkins
Brecknock	Andrew King
Caernarfon	Geoff Gibbs
Cardigan	Moira Convery
Carmarthen	Terry Wells
Clwyd (East)	Anne Brenchley
Clwyd (West)	Mel ab Owain
Glamorgan (Mid, South)	Wayne Morris
Glamorgan (West)	Lyndon Jeffery
Gwent	Jerry Lewis
Merioneth	Rob Morton
Montgomery	Jane Kelsall
Pembrokeshire	Annie Haycock
Radnorshire	Carlton Parry

NORTHERN IRELAND

BTO Northern Ireland Officer	Shane Wolsey
Antrim & Belfast	Ruth Wilson (now Kevin Mawhinney)
Armagh	Stephen Hewitt
Down	Alastair McIlwain
Fermanagh	Michael Stinson
Londonderry	John Clarke
Tyrone	Michael Stinson

CHANNEL ISLANDS

Channel Islands (excl. Jersey)	Chris Mourant
Jersey	Tony Paintin

ISLE OF MAN

Isle of Man	Pat Cullen (now David Kennett)

We would be grateful for help organising the BBS in regions currently without a Regional Organiser (marked **VACANT**). If you live in one of these regions and would be interested in taking on the role, please let us know.

Many thanks are due to the following ROs who retired during the past year, having supported the BBS in their regions: Terry Coster, Pat Cullen, Peter Kent, Peter Overton, Ruth Wilson and Ian Woodward.

We would like to thank and welcome Rod Bleach, James Cassels, Mike Daly, Peter Ellis, Mike Gibson, David Kennett, Kevin Mawhinney, Dave McGarvie and Michael Williams who have taken over as ROs during the past year.

Finally, we would like to thank all the landowners who kindly allow volunteers to walk BBS transects on their land.

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