



The Breeding Bird Survey 2022 *incorporating the Waterways Breeding Bird Survey*

Population trends of the UK's breeding birds



THE 2022 BBS REPORT

THE BBS PARTNERSHIP

The BTO/JNCC/RSPB Breeding Bird Survey is a partnership jointly funded by the BTO, RSPB and JNCC, with fieldwork conducted by volunteers. The Breeding Bird Survey (BBS) now incorporates the Waterways Breeding Bird Survey (WBBS).

The members of the BBS Steering Committee in 2022 were James Pearce-Higgins (Chair, BTO), Dawn Balmer (BTO), Simon Gillings (BTO), Dario Massimino (BTO), David Noble (BTO), Simon Wotton (RSPB), Leah Kelly (RSPB) and Paul Woodcock (JNCC).

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BTO is a Registered Charity, Number 216652 (England & Wales), SC039193 (Scotland).

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THE BBS TEAM AT BTO

James Heywood is the BBS National Organiser and first point of contact for BBS or WBBS queries. James 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. David White supports James, part-time, primarily with the volunteer coordination of these surveys.

Dario Massimino, Senior Data Scientist in the Bioacoustics and Data Science Team, produced the bird and mammal population trends for 2022. David Noble is the Head and Principal Ecologist, responsible for strategic developments in biodiversity monitoring. Dawn Balmer is Head of Surveys, which includes both BBS and WBBS among other surveys. Maria Knight, Secretary in the Science Department, works closely with James & David assisting with the running of the surveys. Simon Gillings oversees the BBS and WBBS research programmes, and James Pearce-Higgins is the Director of Science.

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ONLINE RESOURCES

Further information, including population trend graphs, can be found at www.bto.org/bbs for BBS, and www.bto.org/wbbs for WBBS, and a full species-by-species discussion of these results, and those from other surveys, can be found on the BirdFacts website at: www.bto.org/birdfacts

This report can be downloaded from: www.bto.org/bbs-report



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ACKNOWLEDGEMENTS

We would firstly like to thank all the volunteers who spend many hours in the field collecting the data for this report. Without their efforts, this scheme would not be possible. We are also grateful to the following people for their help in 2022: Ollie Barrett, Matthew Baxter, Neil Calbrade, Lee Carnihan, Ben Darvill, Mark Hammond, Stephen Hewitt, Kelvin Jones, Andrew Joys, Sorrel Lyall, Steve Pritchard, Dave Turvey, Justin Walker and Steve Willis. Many people have contributed to both the BBS and WBBS schemes' development and organisation, including Nicholas Aebischer, Mandy Andrews, Mark Avery, Stephen Baillie, Ian Bainbridge, Helen Baker, Richard Bashford, Jessa Battersby, Gill Birtles, George Boobyer, Andy Brown, Steve Buckland, Nick Carter, Steve Carter, Dan Chamberlain, Rachel Coombes, Humphrey Crick, Sarah Davis, Iain Downie, Sarah Eglington, Steve Freeman, Colin Galbraith, David Gibbons, John Goss-Custard, Rhys Green, Jeremy Greenwood, Richard Gregory, Rob Keen, John Marchant, Ian

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We acknowledge the support of the Northern Ireland Environment Agency, who fund professional fieldworkers to cover squares in Northern Ireland. Natural England, NatureScot and Forestry Commission Scotland (now Scottish Forestry) have contributed to additional surveys on Upland BBS and Scottish Woodland BBS squares in previous years. We are very grateful to the RSPB for funding the initial development of BBS Online, and to the BTO Information Systems Team who have continued to develop the system and provide technical support.

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, BTO, JNCC and RSPB and sponsored by Severn Trent, Anglian Water and by Essex & Suffolk Water. The WBBS was adopted into the BBS Partnership in 2017.

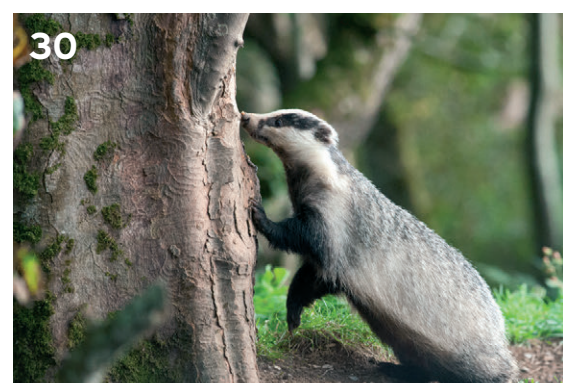
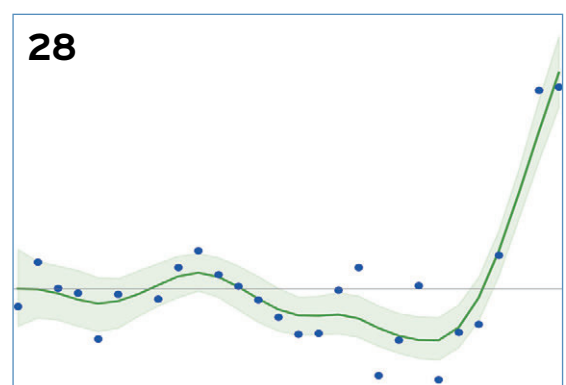
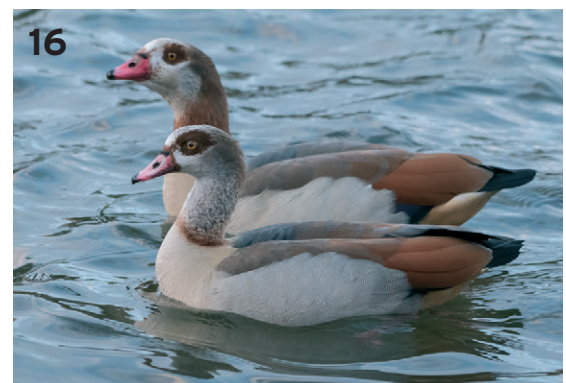
The report was produced by James Heywood. The cover photo of a Blackbird was kindly supplied by Sarah Kelman/BTO images and the report was printed by Swallowtail Print, Norwich, using carbon-balanced paper from responsible sources.



INSIDE ...

This is the 28th annual report of the BTO/JNCC/RSPB Breeding Bird Survey (BBS) and Waterways Breeding Bird Survey (WBBS), documenting the population trends of widespread UK breeding bird species during the periods 1994–2022 and 1998–2022 respectively. These are the main schemes for monitoring the population changes of the UK's widespread breeding birds, providing an important indicator of the health of the countryside. Trends are produced each year, with those for 118 species based on BBS data, and those for 28 waterway specialist species based on WBBS data. The results are used widely to set priorities and to inform conservation action.

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CITATION

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Breeding Bird Survey: latest news

As well as building on the strong, post-COVID-19 recovery seen in 2021, 2022 was both a year of change and consolidation as the BBS team welcomed new personnel.

James Heywood, BBS National Organiser, BTO

As the Breeding Bird Survey (BBS) enters its 30th year, we reflect on the continued recovery of volunteer effort following the restrictions of 2020. A nearly identical number of squares – 3,919 – were covered in 2022, only 26 fewer than the previous year. Yet another record was set for coverage in Scotland, a joint record in the Isle of Man and a small resurgence in Wales.

PERSONNEL

After eight years as the BBS National Organiser, BBS said farewell to Sarah Harris. It is with great pleasure, however, that we can say that Sarah hasn't moved far; she remains at BTO and now runs the Seabird Monitoring Programme (SMP). SMP is another survey managed by the BTO, JNCC and RSPB in partnership and given the well publicised impacts of Highly Pathogenic Avian Influenza (HPAI) on our seabirds, her expertise comes at an important time for the scheme. As well as taking on the running of SMP, Sarah remained at the helm of BBS for most of 2022 and so this report and its contents owes as much to Sarah's hard work as any of the previous eight years.

James Heywood took over the reins of BBS and the Waterways Breeding Bird Survey (WBBS) in November 2022. James has most recently been an ecological consultant. He has swapped his own field recording sheets to looking after those of the 3,000 plus volunteers who are registered with the survey each year. James is an eager birdwatcher and lives in Cambridgeshire.

Sarah has a few words:

"I just wanted to say a big thank you for supporting the BBS and/or WBBS during my time as National Organiser. The surveys are in a really good place and set for great things with James at the helm. I hope you continue to enjoy taking part in the surveys! Thank you."

2022 also saw the addition to the BBS team of David White. David joined in March 2022, supporting the National Organiser for two days a week. David also works in the BTO's Engagement Team and is ideally suited to much of the volunteer facing aspects of the job where his dual role dovetails perfectly. He may be well known to many readers as a past Garden BirdWatch officer at BTO and a previous employee of RSPB.

IMPACT

As ever, the publication of the trends from BBS squares, recording of mammals and WBBS stretches is accompanied by a number of articles that summarise the outputs and research undertaken by the partners and external collaborators using BBS and WBBS data. This year there is a particular theme on environmental policy and planning. **Page 8** sees an extended article on the importance of the network of Protected Areas in the UK on our conservation objectives. This summarises two pieces of work, one led by BTO, the other by RSPB, both of which show that Protected Areas in the UK are working for our birds. Joe Cooper explains on **Page 12** how the design of our urban landscapes can impact local bird populations and how this might be predicted at the planning stage, and a summary of work done jointly by BTO and RSPB on Swift declines is presented on **Page 13**. We are also able to report on research into Badger culling, another policy related area, as Charlotte Ward writes on **Page 30** about the work done to assess the impact on bird populations as a result of the ongoing Badger culls in the south-west of England.

BIRDFACTS

Relaunched in February 2023, BirdFacts provides a revised portal for discovering important information about the UK's birds and their changing circumstances. BirdFacts pulls together more content and information from many surveys run by BTO, JNCC and RSPB, both solely, and in partnership.

Species pages combine with the most up to date data on population trends from the interactive Trends Explorer and BirdTrends. Much of the data presented and used in species assessments is due to the existence of BBS/WBBS and its volunteers.

Find out more at: www.bto.org/birdfacts

WIDER COUNTRYSIDE BUTTERFLY SURVEY

2022 saw the publication of the fifth *State of the UK's Butterflies*. This includes data from the Wider Countryside Butterfly Survey (WCBS) which in turn is partly supported by BBS volunteers on BBS squares in tandem with Butterfly Conservation's own sites.

The trends published in the report are generated from data from the UK Butterfly Monitoring Scheme (UKBMS), of which the WCBS is a part. In 2022, a total of 843 squares were covered by the scheme, of which 309 were on BBS squares. This is the second highest coverage on BBS squares in the last decade and up 25 from 2021. Thank you to all who took part in 2022.

The report highlights, as have many of its predecessors, the worrying declines in our butterfly populations; 80% of the UK's butterflies have decreased in abundance and/or distribution since the 1970s. The groups most reliant on specific habitats to complete their life-cycles are the ones to have declined the most. Habitat specialists, as a group, have seen their abundance decline by over one quarter (27%) and their distribution decline by over two-thirds (68%) since 1976.

But, and as we know with our bird populations, not all species in all locations are suffering. In particular, Scotland is seeing the northward expansion of many butterflies as a result of climate change, similar to what has been observed in some bird species (see 'Scotland Population Trends', [Page 20](#)). Scotland is the only UK country where the amalgamated 'all-species' butterfly indicators show a long-term increase in abundance and distribution.

Further development to BBS Online now makes it easier to manage participation of BBS volunteers in WCBS, with additional tools for Regional Organisers to manage volunteers, and also volunteers are able to 'register' their square as available for survey by a Butterfly Conservation volunteer.

If you are interested in participating in the WCBS via a BBS square, contact bbs@bto.org. For further information on WCBS and how to participate, please visit the WCBS 'taking part via BBS' [webpages](#).

TICKS, LYME DISEASE RISK AND BBS

Nineteen BBS squares were visited in 2022 by researchers from the University of Exeter who are interested in the relationships between the occurrence of ticks, and bird abundance and community composition. Some preliminary results are already available:

*Lyme disease is a common and debilitating tick-transmitted disease, with more than 1,500 recorded cases in the UK each year. The disease is caused by the bacterium *Borrelia burgdorferi sensu lato*, which is transmitted from wild animals (including birds) to humans via tick bites. Previous research suggests that higher diversity of natural hosts (including birds) can lead to a reduction in tick abundance and disease prevalence, known as the 'dilution effect'.*

In a MSc project, in collaboration between the University of Exeter and BTO, we performed a pilot study to test if bird abundance predicts tick abundance at BBS sites. In spring 2022, we visited 19 BBS squares and determined tick abundance in the vegetation. First results indicate that the density of ticks is lower at sites with higher bird abundance (Figure 1).

*In 2023, we hope to expand upon this work by including more squares across the south-west of England and testing collected ticks for *Borrelia* infections to quantify effects of bird community composition on *Borrelia* infection risk. This project will provide insights into the mechanisms that regulate disease risks and the value of biodiversity for human health.*

(Emile Michels, University of Exeter)

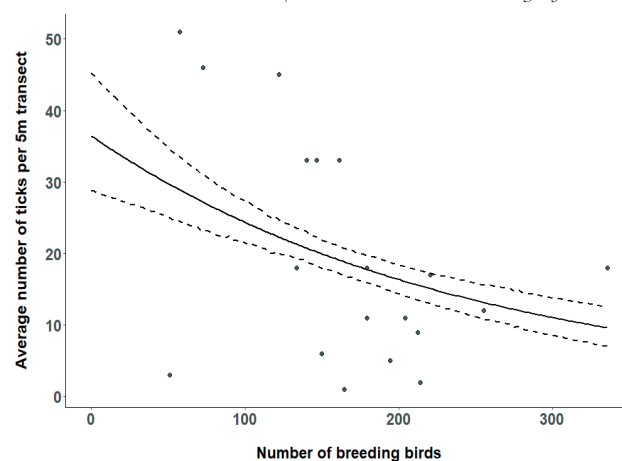


Figure 1: Tick density decreases with increasing bird abundance at BBS sites.

FIND OUT MORE...

Fox R., Dennis E.B., Purdy K.M., Middlebrook I., Roy D.B., Noble D.G., Botham M.S. & Bourn N.A.D. 2023. *The State of the UK's Butterflies 2022*. Butterfly Conservation, Wareham, UK.

Mannelli, A., Bertolotti, L., Gern, L. & Gray, J. 2012. Ecology of *Borrelia burgdorferi sensu lato* in Europe: transmission dynamics in multi-host systems, influence of molecular processes and effects of climate change, *FEMS Microbiology Reviews* **36**: 837-861.

Sightings and coverage in 2022

It is heartening to see that the resurgence in square coverage seen in 2021 following the restrictions of the COVID-19 pandemic was maintained in 2022. With only 26 fewer squares covered in 2022, it charts another successful year for the survey.

Ignoring 2020, 2022 sees the sixth consecutive year of record square coverage in Scotland with a total of 633 squares. This is undoubtedly partly due to the introduction and continued success of Upland Rovers, which has a predominance of eligible squares in Scotland, alongside BBS-specific engagement and training.

Whilst there has been a steady drop off in coverage in Wales since the mid-2010s, 2022 shows an increase of nearly 4.5% (13 squares) from 2021 to 2022. Wales has been an important historical refuge for several avian and non-avian species that have since re-colonised Great Britain (e.g., Red Kite, Polecat) and continues to play an important role in the UK for our woodland birds (e.g., Pied Flycatcher, Wood Warbler). BBS coverage west of Offa's Dyke is really important for our ability to monitor the changes of some of these habitat specialists.

Coverage in Northern Ireland dropped to near 2018/2019 levels following a record in 2021. This is largely on account of a reduction of coverage by professional surveyors, who have been important in helping to cover the west of the country, where low human population density, physical geography and access make it more challenging for us to cover with volunteers. Even finding professional surveyors to cover squares in Northern Ireland has been difficult at times recently. Nevertheless, we are hopeful that a renewal of funding, specifically aimed at increasing training,

participation and coverage in Northern Ireland, will be confirmed soon for a further five years.

Record coverage in the Isle of Man continues for the second consecutive year, as 10 squares were surveyed once again.

SIGHTINGS

A total of 231 species were recorded in 2022 on BBS squares. Of the rarer birds encountered, highlights included a Red-backed Shrike in the north of England, Little Bittern on the Isles of Scilly and Honey-buzzard in south Wales. The most widespread species, as measured by the percentage of squares covered in 2022, were Wren (92%), Woodpigeon (91%), Blackbird (89%) and Robin (87%). Chaffinch, whilst suffering declines across the UK as reported in this publication in previous years (e.g. Harris *et al.* 2020), is still ranked as the seventh most widespread species in BBS, being observed in 83% of squares.

Once again, the most species diverse square of 2022 was in Wiltshire, where 66 species were recorded over the two visits, down from 76 in the same square in 2021. Ten squares returned a total of 60 or more species over the two visits. At the other end of the scale, three squares recorded just a single species; it will come as little surprise that Meadow Pipit was the single species in these three upland squares. Regardless of diversity, all squares are equally important in their capacity for understanding population changes of our birds.

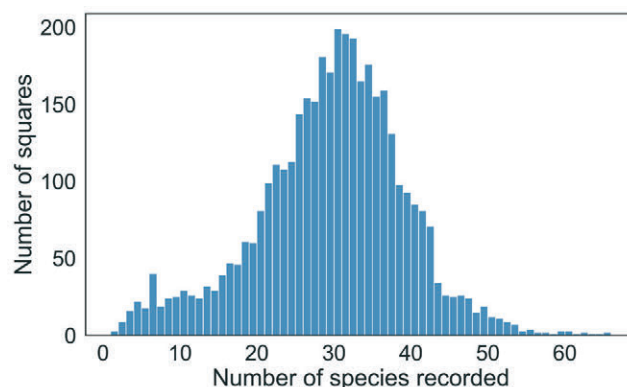


Figure 2: Distribution of species recorded on BBS squares.

Table 1: The number of BBS squares with data received to date, with milestones underlined and the total number of volunteers participating by year.

	1994	1995	1996	1997	1998	1999	2000	2001*	2002	2003	2004	2005	2006
England	1,172	1,321	1,420	1,657	1,712	1,791	1,749	532	1,652	1,738	1,884	<u>2,180</u>	2,569
Scotland	245	283	<u>308</u>	313	309	275	246	78	231	255	273	305	336
Wales	122	121	116	138	192	<u>223</u>	213	22	215	214	253	271	272
Northern Ireland	25	17	65	75	85	95	83	-	97	<u>109</u>	102	120	107
Channel Islands	1	1	7	6	7	7	7	7	7	7	<u>11</u>	13	19
Isle of Man	4	4	4	6	6	5	3	-	3	4	6	3	5
Coverage Total	1,569	1,747	1,920	<u>2,195</u>	2,311	2,396	2,301	639	2,205	2,327	2,529	<u>2,892</u>	<u>3,308</u>
No. of volunteers	838	<u>1,013</u>	1,197	1,523	1,830	1,917	1,858	542	1,778	1,871	<u>2,022</u>	2,332	2,660

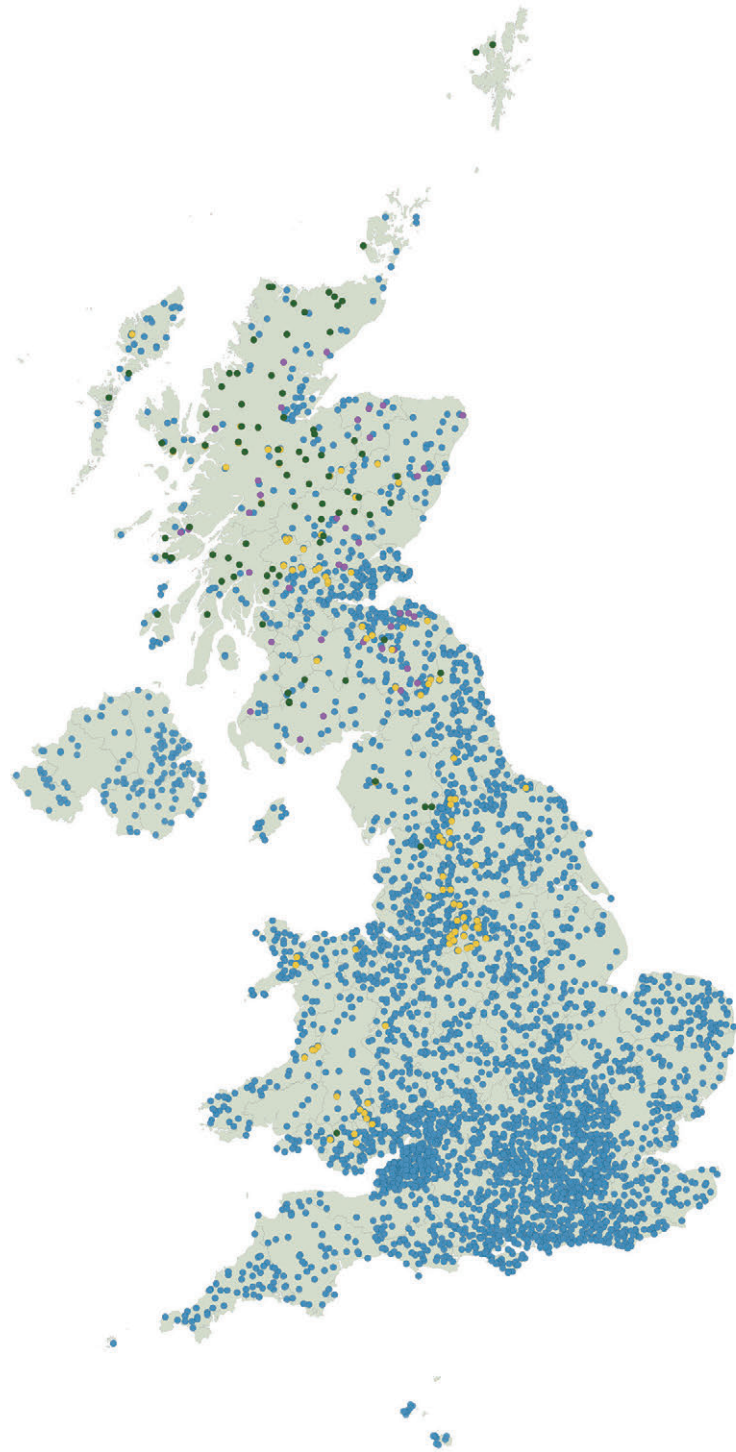
As for 2021, 79% of squares surveyed come with information on the method of detection (song, call or visual) and colonies were recorded on 417 squares.

COVERAGE OVERVIEW

This coverage map illustrates where the **3,701 'core'** ■ **BBS squares**, **94 'add-on'** ■ **Upland Adjacent squares**, **38** ■ **Scottish Woodland (SWBBS) squares** and **86** ■ **Upland Rovers squares** were located. Combined, these make up the **3,919 BBS squares covered in 2022**. The apparent drop in Upland Rover squares from 2021 (102) is down to the fact that nearly a fifth of these squares have been 'returned' to the set of 'core' squares. It is really nice to see that many Upland Rover volunteers have become so attached to their upland square that they want to pay it a second visit each year.

In 2022, a minimum of 14,494 km was walked by BBS volunteers during the surveys. That is the same as a return flight from the RSPB HQ in Sandy to Havana, Cuba and back. Of course, that only includes the 'surveyed' distances, the distance travelled by surveyors between transects and returning to starting points could easily be double that.

Squares from the Upland BBS and SWBBS-Adjacent schemes, covered between 2006 and 2013 by professional fieldworkers, are not shown on this map nor in Table 1 as they are not part of the BBS square set outside of these professionally surveyed years. Data from these squares in the years covered are included in the data analysis and trend calculations for the years they were surveyed. Ongoing, professional coverage of squares in Northern Ireland is included in the map and table. Please see pages 14 and 15 for more information on these surveys and square types.



2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020 [†]	2021	2022
2,822	2,556	2,569	2,566	2,538	2,671	2,729	2,734	2,832	2,875	2,948	2,992	2,937	1,762	2,836	2,821
<u>486</u>	404	396	331	358	383	471	482	476	490	<u>523</u>	581	<u>608</u>	156	627	633
269	242	235	246	223	275	<u>332</u>	340	343	334	340	332	325	61	301	314
129	121	116	115	110	117	127	120	78	127	131	119	119	28	<u>152</u>	125
16	15	17	16	15	<u>21</u>	26	27	23	24	28	20	21	17	19	16
4	1	-	-	-	4	-	-	3	2	3	4	8	9	<u>10</u>	<u>10</u>
3,726	3,339	3,333	3,274	3,244	3,471	3,685	3,703	3,755	3,852	3,973	4,048	4,018	2,033	3,945	3,919
2,959	2,639	2,570	2,553	2,489	2,628	2,775	2,734	2,793	2,797	2,836	2,835	2,775	1,452	2,711	2,738

* 2001: foot-and-mouth disease, † 2020: COVID-19

Protected areas benefit birds

Protected areas may seem intuitively like a good idea when it comes to conserving species and habitats, but how well do they actually work? BBS data were amongst the data used to assess the UK's protected area network in two separate studies by the BTO and RSPB.

Ailidh Barnes, Research Ecologist, BTO; Fiona Sanderson, Principal Conservation Scientist, RSPB; and Blaise Martay, Research Ecologist, BTO

Biodiversity loss is one of the biggest environmental threats globally, and protecting areas of land and sea is one approach to tackling this. However, it can be difficult to measure how effectively such protected areas actually work. We set out to explore this issue in recent papers, using the UK's birds as examples in terrestrial sites.

WHAT ARE PROTECTED AREAS?

The UK has three main types of statutorily designated protected areas that could benefit birds: Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Sites of Special Scientific Interest (SSSIs). SPAs and SACs are designated by the European Natura 2000 legislation. SPAs are designed to protect birds by conserving the 'best' areas for particular bird species following the Birds Directive (EC/14/2009), whereas SACs are aimed at protecting habitats and biodiversity through the Biodiversity/Habitat Directive (EC/43/1992). SSSIs are designated under UK national legislation but have less legal protection than the Natura 2000 network and come under the National Parks & Access to the Countryside Act 1949 and the Wildlife & Countryside Act 1981. The different aims of these protected areas are part of the reason that finding measures for their success is challenging, along with variation in how protected areas are managed and limited site-specific monitoring.

WHAT WE DID

Luckily, we have large-scale and long-term national datasets at our fingertips to address these challenges. The BTO study, published in the journal *Nature Ecology and Evolution*, considered species occurrence, colonisation and persistence between the two most recent BirdAtlas periods (1988–91 and 2007–11). Bird species abundance and population trends were investigated using BBS data (1994–2019); and we examined breeding success using productivity (the

Box 1: Protected Sites in the UK

There are a number of types of conservation designations in the UK. This study looked at the three with the highest level of protection. Some (SPAs and SACs) are International, being defined by Europe-wide criteria, others are UK based only.

Special Protection Areas SPA: These are selected to protect one or more rare, threatened or vulnerable bird species listed in Annex I of the Birds Directive, or certain regularly occurring migratory species. Examples (and their reason for designation) include the Breckland, East Anglia (for Woodlark, Stone Curlew and Nightjar) and Somerset Levels & Moors (wintering wildfowl and waders).

Special Areas of Conservation SAC: These protect one or more special habitats and/or species – terrestrial or marine – listed in the Habitats Directive. Examples include Amat Woods, North Scotland (for Caledonian Forest/Pinewoods) and Severn Estuary (mudflats, estuarine 'salt meadow' and lampreys).

Special Site of Scientific Interest SSSI: These are a UK-based designation and may be based on particular flora, fauna or habitats. Examples include The Cotswold Water Park (based on breeding and non-breeding birds, supported by the BTO/RSPB/JNCC Wetland Bird Survey (WeBS) data).

There are other statutory designation types that exist both a National and Local level:

National Nature Reserve NNR: Established to protect the most significant areas of habitat and of geology.

Ramsar: The Convention on Wetlands of International Importance. In practice, Ramsar sites are also usually designated as SPAs or SACs.

number of young fledged per adult) as obtained from Constant Effort Sites (CES) ringing during 1990–2019. These measures were related to the survey sites with varying extents of the three types of protected area and all three combined.

These analyses allowed us to test specifically whether protected areas are associated with greater abundance and probability of occurrence of bird species than non-protected parts of the UK, whether they lead to more positive (or less negative) trends in species abundance and occurrence. Importantly, since protected areas tend to be commonest in particular landscapes, we were able to account for differences in land-use. We also tested which species were most affected by the extent of protected area, by looking at how different traits, such as which habitats species were associated with, whether the species were Annex- or Schedule 1-listed and therefore were protected themselves, and an ecological model looking at the population size and trend of the bird species. Lastly, we investigated bird community metrics of: species richness, diversity, evenness, a Community Specialisation Index (how specialised species were) and a Community Temperature Index (whether species preferred more cold or warmer regions) in sites with differing extents of protected areas.

In a separate study published in the journal *Animal Conservation*, the RSPB Centre for Conservation Science and BTO used BBS data to see whether there was a link between bird abundance and site legal protection. This looked specifically at the most threatened birds (those species which were Red- or Amber-listed at the time of the analysis) and the least threatened ones (Green-listed at the time of the analysis).

WORKING AS THEY SHOULD

The results from the BTO-led study are encouraging. We found that species occur more frequently and in higher numbers where there is a greater extent of protected area coverage. Species are also more likely to colonise these sites, and less likely to become extinct there (Figure 3). Importantly, protection proved most beneficial for rare, declining and threatened species, wetland and woodland specialists and species most vulnerable to climate change – exactly the sorts of species we would want to benefit from protection. Declining bird species had more positive trends in sites with better protection, although generally

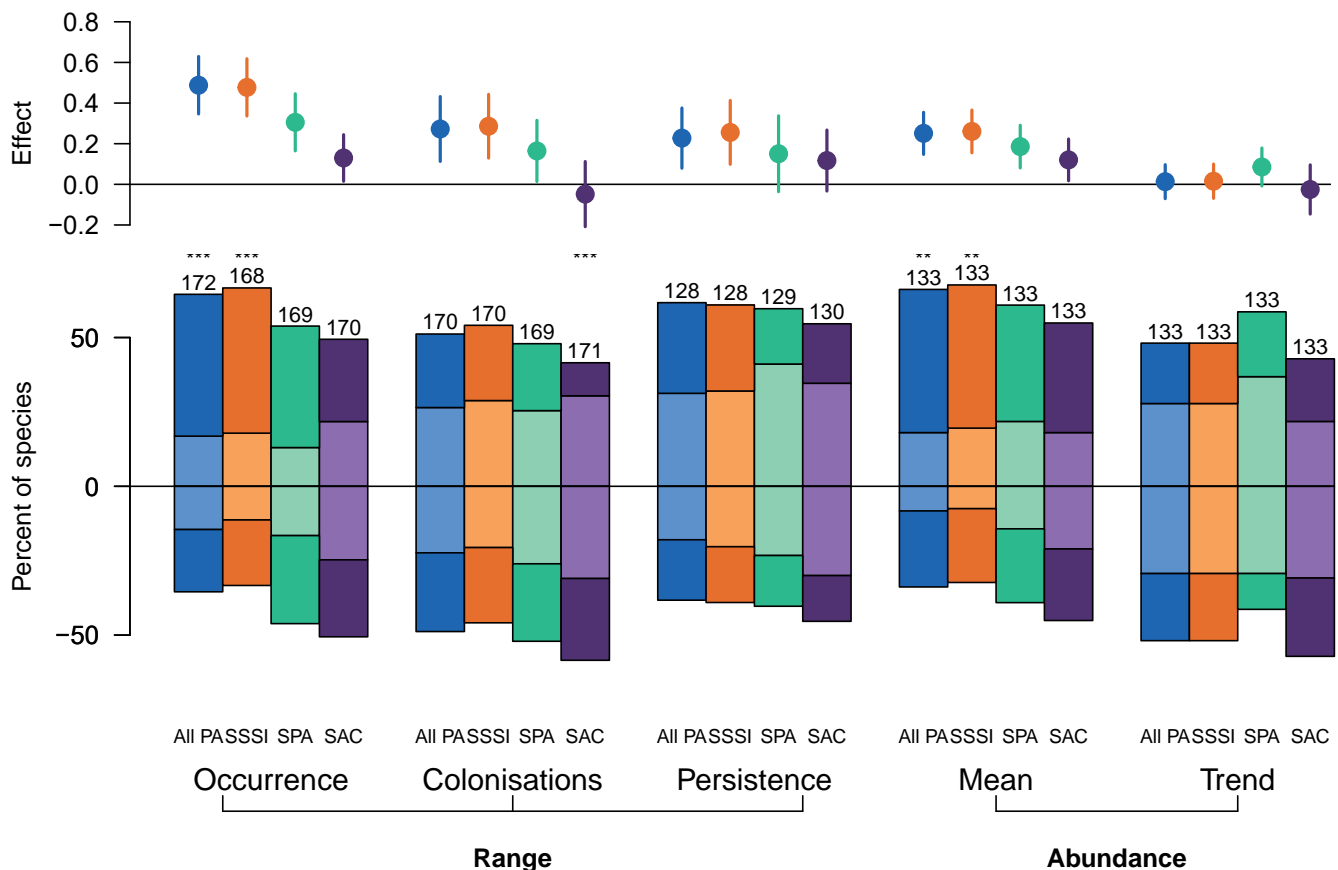


Figure 3: The bars (bottom) represent the percentage of species and the points (top) represent the mean (and 95% confidence intervals) of the effect sizes among individual species with negative and positive associations between the population measure (occurrence, colonisation, persistence, abundance and trend in abundance) and percentage cover of protected area within the surveyed square. In the bar chart, species with a significant relationship with the different designations are shown in dark colours while species with a non-significant relationship are shown in light colours. The numbers indicate the sample size for each. The asterisks indicate whether more species show significant positive effects in response to protected areas than expected by chance alone. **P<0.01, *** P<0.001.

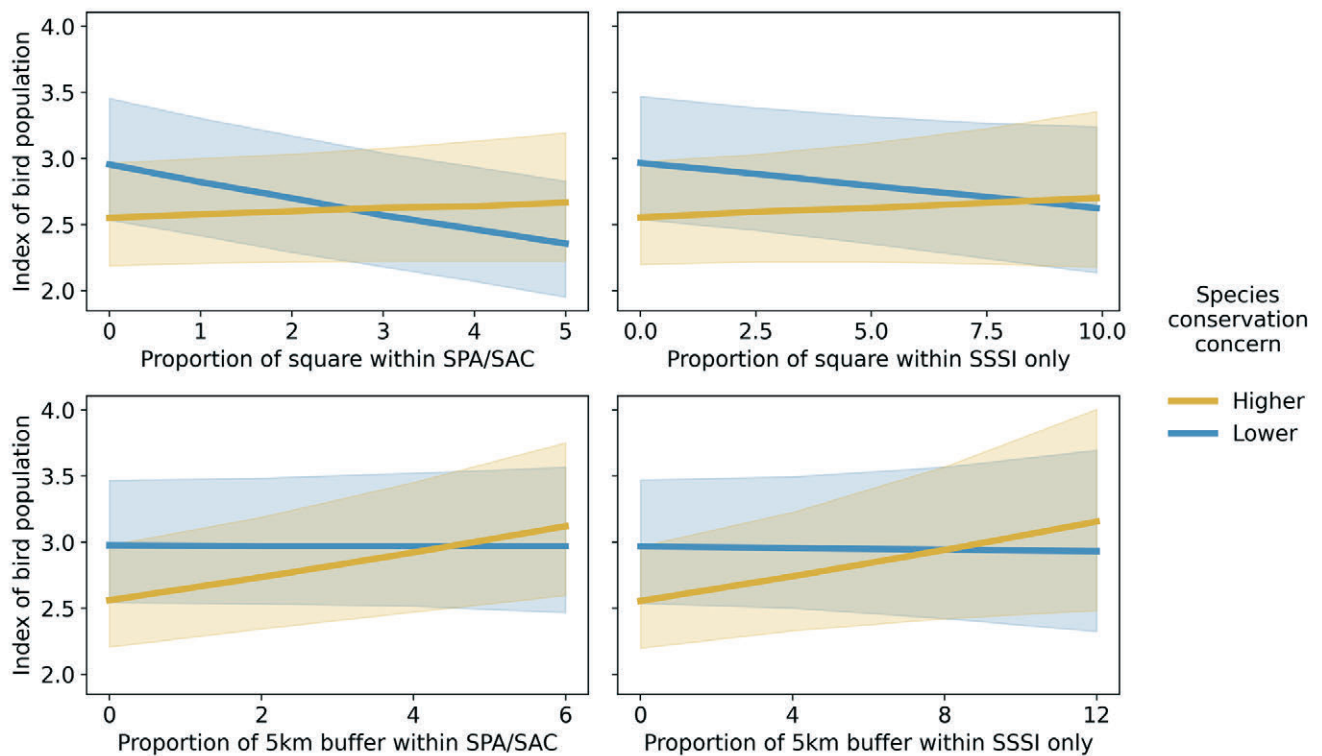


Figure 4: Relationships between the standardised proportion of a BBS square that is in an SPA/SAC (a) or SSSI only (b), or a 5 km buffer beyond it (c & d), and an index of bird abundance for species that are of higher (orange lines/shading) or lower conservation concern (blue lines/shading). Greater proportions of protected areas benefit species of higher conservation concern more. Shaded areas are 95% confidence intervals.

we did not find protected areas to be associated with more positive (or less negative) trends in abundance across all species. The study led by RSPB expands on this, finding that numbers of species threatened in the UK – including many for which the sites were not originally designated – were higher where more of the survey site was inside a protected area or where the survey site was within 5 km of a protected area (Figure 4a,b). The more protected area there was close to the BBS square, the more likely threatened species were to increase in abundance over time. This suggests that protected areas benefit more species and that these gains ‘spill over’ beyond their boundaries.

Although reproductive success was lower overall in sites with more protected area (SPA, SAC and SSSI), in sites with just SPAs some species, such as Treecreeper, Sedge and Garden Warbler, which did show higher productivity also had higher abundances with a greater extent of SPA. Furthermore, for certain species, such as Greenfinch, we found that productivity increased more over time, in SPAs. These species also had more positive trends in abundance in protected areas designated as SPAs, indicating that higher breeding success is associated with more positive trends in abundance. This is the first time this effect has been shown, and provides a potentially important way for managers to improve their sites.



▲ Treecreeper was one of the species found to have greater productivity and abundance where SPAs were greater in extent.

DESIGNATION MATTERS

On average, we found that protected areas did not have a greater diversity of birds than other parts of the country. However, since they support habitat specialists and cold-adapted bird species, our results suggest that protected area networks could buffer species' community responses to climate change, including by facilitating climate-driven colonisation of new sites. Importantly, we found that designation matters. SPAs are more effective for birds than SACs, so targeted designation (and management) benefits the species in most need of conservation action.

In one of the least biodiverse nations on Earth, where 29% of all bird species are regarded as being of high conservation concern, these papers demonstrate the value of protected areas and show how measures aimed at protecting particular species also deliver positive benefits for wider biodiversity. The findings underline the fundamental role of protected sites in safeguarding nature and supporting its recovery by creating a network of sites whose positive effects are not only site-specific, but spill over into the wider landscape – vital in an era of rapid anthropogenic change. Furthermore, we show the potential for them to work better if more areas are managed for target species and the condition of the

CREDITS

Thanks to the JNCC and the Country Nature Conservation Bodies (Natural England, Natural Resources Wales, NatureScot and the Department of Agriculture, Environment and Rural Affairs in Northern Ireland) for funding this research, which was part of the Terrestrial Surveillance Development and Analysis contract.

areas already protected are improved to make sure these are effective for the nature they sustain.

The UK has committed to protecting 30% of land and sea by 2030 as a key part of renewed goals to protect biodiversity, made under the new UN Convention on Biological Diversity (CBD) agreement last year (the '30x30' target). However, although 28% of UK land currently has some form of protection, only 11% is protected primarily for nature and much of this is not in favourable condition (Starnes *et al.* 2021; JNCC 2022). Our new studies demonstrate the critical role of the existing sites that are designated specifically for conservation, and provide strong evidence of the need to strengthen and expand this network to meet the 30x30 target by committing to protected areas that are managed effectively for conserving biodiversity.



▲ Wetland specialists, like Avocet, are one of the groups which are protected by and benefit most from protected areas.

FIND OUT MORE...

Barnes, A.E., Davies, J.G., Martay, B., Boersch-Supan, P.H., Harris, S.J., Noble, D.G., Pearce-Higgins, J.W. & Robinson, R.A. 2023. Rare and declining bird species benefit most from designating protected areas for conservation in the UK. *Nature Ecology & Evolution* **7**: 92–101. <https://doi.org/10.1038/s41559-022-01927-4>

JNCC, 2022. *UK Biodiversity Indicators 2022. C1. Protected areas*. Available at <https://jncc.gov.uk/our-work/ukbi-c1-protected-areas> (Accessed 25/04/2023)

Sanderson, F.J., Wilson, J.D., Franks, S.E. & Buchanan, G.M. 2023. Benefits of protected area networks for breeding bird populations and communities. *Animal Conservation* <https://doi.org/10.1111/acv.12832>

Starnes, T., Beresford, A.E., Buchanan, G.M., Lewis, M., Hughes, A. & Gregory, R.D. 2021. The extent and effectiveness of protected areas in the UK *Global Ecology and Conservation* **30**: e01745, <https://doi.org/10.1016/j.gecco.2021.e01745>

Birds and housing developments

A recently published study reveals how BBS data recorded in urban areas, sometimes a thankless task, can be used to predict the bird species in a new housing development.

Joe Cooper, Research Ecologist, BTO

The foundation of this work lies in our already-developed urban modelling framework and focused exclusively on BBS transect sectors labelled as “human sites”.

From these we extracted bird survey data. We matched these with a range of metrics describing urban and urban-fringe habitats, obtained from digital maps. Together, this allowed us to build a picture of how 54 bird species interact with urban and urban-fringe environments.

To assess a new housing development, we took architects’ plans (Figure 5a), which were freely available online, and re-drew them digitally in their proposed location using GIS software (Figure 5b). This is necessary as birds are affected by both the habitats they directly interact with, but also features of the wider environment. By calculating the same metrics for the proposed development, we could predict the bird species we’d expect to find if you performed a BBS survey there.

MAKING HOUSING DEVELOPMENTS MORE WILDLIFE-FRIENDLY

We modified the original development with some conservation-minded principles and examined whether those changes affected the species we predict would be present. In a research paper published in the journal *Landscape and Urban Planning*, we presented results for nine currently planned housing developments, as well as five modifications (scenarios) for each.

Our main finding was that there is no one-size-fits all solution to creating biodiverse housing developments. In our example (Figure 5c), adding a few new ponds meant three additional wildfowl and gull species than would be expected to be recorded than under the original design (Table 2). Yet in other developments, new ponds were predicted to have a negligible or even negative effect on species diversity, but you could encourage the same wildfowl species with amenity/recreational grassland.

When looking at changes in counts of common species, we saw lower predictions for household favourites such as Robin, Blue Tit and House Sparrow in our example (Table 2). This, inevitably, leads to conversations about the relative value of different species, for which a standard benchmark might be conservation priorities. But in urban contexts, do we need to consider other criteria, such as engagement, detectability, or dependency on housing? There is a discussion to be had on these issues, and the hope is that our modelling framework can provide planning professionals data-driven outputs to inform their decision-making,

particularly with environmental legislation regarding planning permission tightening.

THANK YOU

To those BBS volunteers who survey populated areas; it might seem like a thankless task at times, even your real zeroes (transect sections lacking in birds) make a real difference for our modelling work here.



Figure 5: (a) Map of an example housing development overlaid onto an aerial photograph. (b) Our digital approximation of the proposed housing development. (c) A scenario where we have introduced ponds (shaded in blue) in public greenspaces > 300 m².

Table 2: Changes in the species we predict in our example pond introduction scenario. New species are those which were not present initially, with loss being those not present after the pond addition.

Degree of change	Species name
New	Mute Swan, Lesser Black-backed Gull, Canada Goose
More	Collared Dove, Feral Pigeon, Herring Gull, Jackdaw, Linnet, Mallard, Pied Wagtail, Swift
Same	Blackcap, Black-headed Gull, Bullfinch, Carrion Crow, Chiffchaff, Coal Tit, Dunnock, Goldcrest, Goldfinch, Great Spotted Woodpecker, Greenfinch, Jay, Long-tailed Tit, Mistle Thrush, Moorhen, Pheasant, Song Thrush, Stock Dove, Swallow, Whitethroat, Willow Warbler, Wren
Fewer	Blackbird, Chaffinch, Great Tit, House Martin, House Sparrow, Magpie, Robin, Rook, Starling, Woodpigeon
Loss	Skylark

Swift declines

One of the most identifiable sounds of summer must surely be that of Swifts screaming overhead. Here for all too brief a time, they are more African than British, the sight of them scything through the air with such intensity on summer's evening is one that increasingly few people can enjoy.

Rob Robinson, Associate Director, Research; BTO and Tom Finch, Conservation Scientist, RSPB

Counts from BBS suggest that numbers have declined by 62% in the last 26 years. But why this sorry state of affairs? That is the question RSPB and BTO set out to answer.

Firstly, Swifts are migratory. Work by BTO and others shows that when our birds leave the UK in late July they head initially to central Africa and then journey on to Mozambique before returning the following May via west Africa (Åkesson *et al.* 2020). So, a key question might be, is there evidence for trouble on that long journey, or do conditions seem tougher here in the UK? We can answer the first of these using ringing data and looking at the chances that individual birds will return to breed the next year. For adult Swifts, we can reasonably confidently state that around 80% will do so each year. This means that around one bird in five will not, and that a Swift can typically expect to live around seven or eight years. Although there is a bit of variation year to year this figure hasn't changed very much over time.

Our estimates of juvenile survival rates were much less clear, but we can be reasonably certain they have declined substantially over time (Figure 6a). Our knowledge of productivity rates is also poor – too few nests are monitored each year, but there is little evidence for changes in the number of eggs laid, although it's possible that fewer nests are surviving to successfully fledge chicks. So, what might cause reductions in nest and juvenile survival? Swifts feed on aerial insects, so we looked at two factors: weather and insect numbers.

Our colleagues at Rothamsted Research have been monitoring insect numbers almost as long as BTO has been monitoring bird numbers. While we found

evidence for fewer flying insects, specifically very well monitored flying aphids, in the south-east of England, overall the changes didn't match the pattern of Swift population changes well. Rather, Swift numbers seemed to dip after years with wet summers (Figure 6b), with the declines in juvenile survival sufficient to account for them. However, because the study focused on aphids, we cannot rule out that changes in other prey groups may have played a role in the decline. One thing we were unable to look at was the availability of nest sites; ensuring these iconic summer visitors have sufficient safe and secure places to nest will be key to keeping our skies filled with these virtuoso aeronauts.

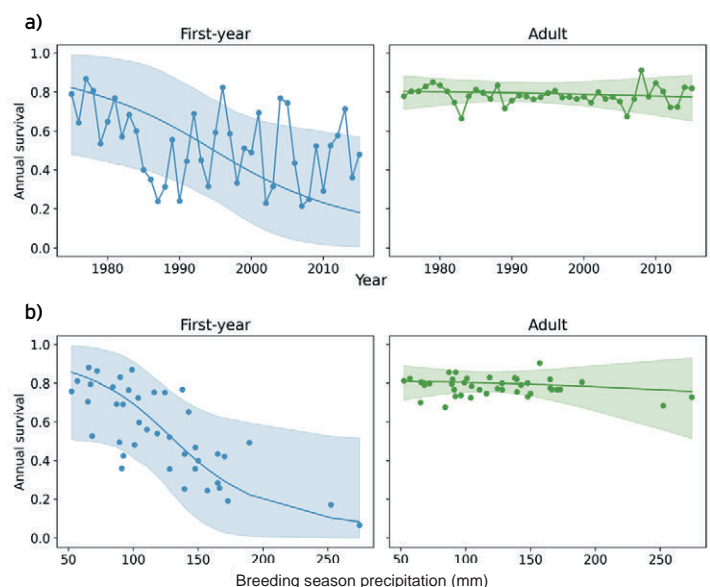


Figure 6: (a) Trends in first-year and adult annual survival over time. Points show the mean annual estimates. (b) The fitted relationship between total precipitation, and first-year and adult survival. Annual first-year survival was negatively affected by high rainfall. Shaded areas show 95% confidence intervals.

FIND OUT MORE ABOUT BOTH ARTICLES...

Åkesson, S., Atkinson, P.W., Bermejo, A., *et al.* 2020. Evolution of chain migration in an aerial insectivorous bird, the common swift *Apus apus*. *Evolution* **74**: 2377–2391. <https://doi.org/10.1111/evo.14093>

Cooper, J.E., Plummer, K.E., & Siriwardena, G.M. 2023. Using species-habitat models to predict bird counts from urban development plans. *Landscape and Urban Planning* **230**: 104629. <https://doi.org/10.1016/j.landurbplan.2022.104629>

Finch, T., Bell, J.R., Robinson, R.A. & Peach, W.J. 2023. Demography of Common Swifts (*Apus apus*) breeding in the UK associated with local weather but not aphid biomass. *Ibis* **165**, 420–435. <https://doi.org/10.1111/ibi.13156>

Plummer, K.E., Gillings, S. & Siriwardena, G.M. 2020. Evaluating the potential for bird habitat models to support biodiversity friendly urban planning. *Journal of Applied Ecology* **57**: 1902–1914. <https://doi.org/10.1111/1365-2664.13703>

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 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 for inputting.

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 adult 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 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 10 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 the 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.

The ‘Upland Rovers’ initiative was introduced in 2017, with the aim of further increasing coverage in remote areas. Carefully selected squares are available to be surveyed just once by ‘roving’ volunteers. These are ‘core’ BBS squares with poor to no previous coverage, upland in habitat type and remote as identified by a combination of distance from road and local human population.

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, Great Black-backed, Herring and Lesser 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 Common Tern, Cormorant, Grey Heron and Little Egret are reported with the caveat that counts may contain a high proportion of birds away from breeding sites.
- Trends for Barn Owl and Tawny Owl are reported with the caveat that the BBS monitors nocturnal species poorly.
- Counts for six wader species (Oystercatcher, Lapwing, Golden Plover, Curlew, Snipe and Redshank) are corrected to exclude counts from non-breeding flocks, and observations of Golden Plover in habitat unsuitable for breeding are also excluded.

As for the 2021 report, we use the standard methods and omit all data from 2020 to prevent the coverage biases from affecting the trends we produce (see Harris *et al.* 2021, 2022). Although we omit the underlying data, we can estimate a trend value for 2020 by interpolating the smoothed trend line between 2019 and 2021.

Interpreting the results

Pages 16–29 contain the annual bird and mammal population trend statistics for the Breeding Bird Survey (BBS), and pages 34–35 cover the Waterways Breeding Bird Survey (WBBS) results. Some guidance on reading and interpreting these tables and graphs is provided here.

THRESHOLDS FOR TRENDS

To ensure robust results we produce trends only for species with sufficient data. To judge this we look at the average number of squares on which a species has been recorded per year during the trend period. For UK BBS trends we consider species above a reporting threshold of 40 squares. For countries within the UK, English Regions and UK WBBS trends, the threshold is an average of 30 squares during the trend period. The one-year change for 2021–22 is shown where the sample size reaches the reporting threshold for one of the longer trend periods. Therefore, if there is a 10-year or ‘all-time’ (26-year) trend, a one-year change is presented.

BBS ‘ADD-ON’ SQUARES

‘Add-on’ squares surveyed during 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.

TRENDS AND TABLES EXPLAINED

Species	Min. sample	1-year (21–22)	10-year (11–21)	26-year (95–21)	LCL	UCL
Stonechat	191	48 *	152 *	195 *	134	298
Wheatear	373	-9	-32 *	-30 *	-41	-16

- Trends for species in brackets are reported with caveats (explanation on Pages 14, 29 and 34).
- For bird trends, **Red-listed** and **Amber-listed** species from *Birds of Conservation Concern 5* (BoCC5) are shown in the relevant colour. The exception to this is in the Wales Population trends, where the *Birds of Conservation Concern 4 Wales* assessments are used.
- The samples sizes refers to the mean number of squares per year on which the species was recorded during BBS or WBBS. The figure shown in the tables, ‘Min. Sample’, is the smaller of these sample size figures for the 10- and all-time trends, per species, per region.

- Trends are presented as the percentage change over three periods: one-year, 10-year and all-time.
- The short-term change covers the most recent years of the survey, i.e. for BBS and WBBS: 2021 to 2022.
- The long-term changes for both BBS and WBBS, cover the lifetime of the survey (BBS birds: 1994–2022, BBS mammals: 1995–2022, WBBS: 1998–2022). The 10-year trends cover 2011–21 for both surveys. All-time and 10-year periods have been smoothed, and the end years truncated.
- 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 longest BBS bird trend: 1995–2021, BBS mammal trend: 1996–2021 and WBBS bird trend 1999–2021.

INTERPRETING GRAPHS

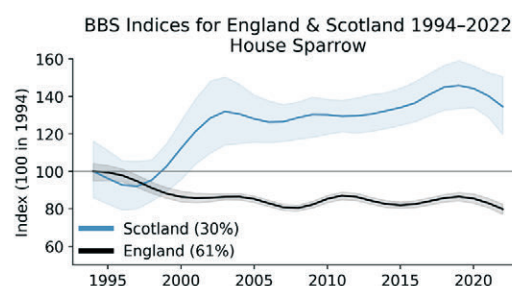
All BBS and WBBS graphs are displayed in the same way throughout the report. Beware, however, that the index and time period axes do vary in scale.

Single region BBS and WBBS index graphs show:

- smoothed trend – dark line
- confidence interval (85%) – pale shading
- annual index values – dots

In addition to these, we produce plots of multiple countries or regions for the same species on the same graph. This is used to illustrate where trends differ among geographical areas, either in their direction, or in the timing of particular changes. Care should be taken interpreting these; higher or lower indices for one region compared to another do not necessarily mean higher or lower abundance or prevalence.

In the example below, House Sparrow are increasing in Scotland and decreasing in England. However, occupancy (number of squares observed as a percentage of the number surveyed) is still higher in England (61%) compared with Scotland (30%). For comparisons of countries and some regions, occupancy rates from 2021 are presented in the figure legend for reference. For clarity, annual index values are not shown in multi-region plots.



ONLINE RESOURCES

BBS BIRD TREND GRAPHS ONLINE: www.bto.org/bbs-graphs
BBS BIRD TREND TABLES ONLINE: www.bto.org/bbs-tables
BBS MAMMAL TRENDS ONLINE: www.bto.org/bbs-mammals
WBBS RESULTS ONLINE: www.bto.org/wbbs-results

United Kingdom: population trends

Following the addition of data from 3,919 squares in 2022 to the BBS data set, we were able to produce trends for bird species which reached the reporting threshold (recorded on 40 or more BBS squares, on average, during the period the trend covers). Trend periods include 26-year (all-time), 10-year and five-year trends; the last are published online at www.bto.org/bbs-tables. In addition, one-year changes (2021 to 2022) are displayed for all species with longer-term trends. For more information on these trend tables, see Page 15.

STATISTICALLY SIGNIFICANT RESULTS

Period	No. species	Greatest change in UK trends	
Long-term (95-21) increases	37	Red Kite	2,105%
Long-term (95-21) decreases	41	Turtle Dove	-97%
Short-term (21-22) increases	8	Egyptian Goose	107%
Short-term (21-22) decreases	21	Ring Ouzel	-32%

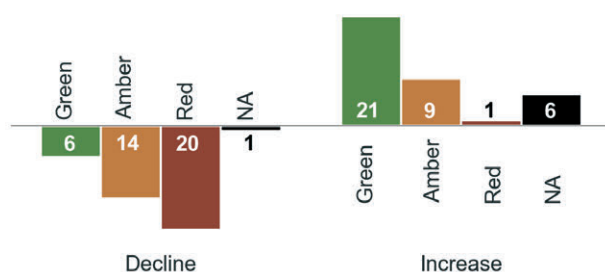


Figure 7: The number of birds with significant long-term declines and increases by BoCC5 assessment status (NA=Not assessed).

SPECIES REPORTING

As for 2021, we report trends on 118 species, with 117 in Table 3 opposite. **Firecrest** is published online with only a five-year trend currently available. Whilst no new trends have been added, one species, **Cetti's Warbler**, does reach the reporting threshold for the UK for the first time. We have been previously reporting on this species at the UK level on account of it having an average sample size of 30 or more for England, where its colonisation continues unabated, with a long-term trend increase of over 750% and one-year (2021–22) increase of 20%.

COLONISTS

The species with the largest single year increase is **Egyptian Goose**. Egyptian Goose, like other non-native wildfowl (e.g., **Canada Goose**) has spread quickly; there was a 56% increase in the number of occupied squares compared to the previous three years and counts are also increased where they occur.

As has been reported in previous issues of this report, other (re)-

colonists, be they assisted through re-introduction (**Red Kite** 2,105% over 26 years) and/or re-colonisation following persecution (**Buzzard** 89%) or human intervention (**Ring-necked Parakeet** 1,960%) all show large, positive long-term trends.

HPAI

Disease has frequently been cited as a cause for long-term decline in these pages and its signal is present in the form of continued long- and short-term declines of **Chaffinch**. More recently, Highly Pathogenic Avian Influenza (HPAI) has been impacting our seabird and other populations (Pearce-Higgins *et al.* 2023). Would there be any signal of HPAI in the BBS trends? Of the species

groups that are considered more vulnerable (e.g., raptors and wildfowl), there are no significant short-term declines, for example in **Buzzard** or **Mute Swan**. Declines are apparent in **Red Grouse**, though this is likely to be for other reasons (see Page 20). It is very likely that it is too early to tell, and we will look to the data from 2023 to see what, if any impact HPAI has had on species monitored by BBS. Early input of data after visits will give us a greater opportunity to scrutinise these data.

RED LIST RECOVERY

Whilst several of our Red-listed farmland birds have declined over the course of the present BBS and its predecessor, CBC, **Corn Bunting** and **Skylark** are both showing signs of a recovery, with significant five- and 10-year increases in the UK. These changes are largely due to changes in England (see Page 18).

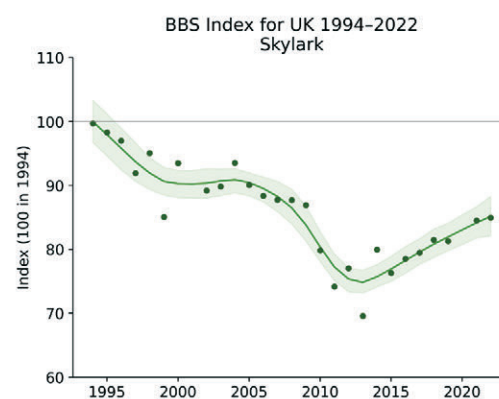


Figure 8: Skylark population trend in the UK. Skylark has increased by 9% in the last 10 years and 8% in the last five years.

FIND OUT MORE...

Pearce-Higgins, J.W. *et al.* 2023. *Highly pathogenic avian influenza in wild birds in the United Kingdom in 2022: impacts, planning for future outbreaks, and conservation and research priorities. Report on virtual workshops held in November 2022.* BTO Research Report 752, British Trust for Ornithology, Thetford.

Table 3: UK population trends during 2021-22, 2011-21 and 1995-2021

Species	Min. sample	1-year (21-22)	10-year (11-21)	26-year (95-21)	LCL	UCL
Canada Goose	570	4	33 *	122 *	56	210
Greylag Goose	304	18	13	201 *	37	577
Mute Swan	278	-5	11	35 *	1	93
Egyptian Goose	34	107 *	54 *	1,726 *	660	>9,999
Shelduck	158	-20	-8	-6	-52	53
Mandarin Duck	39	-19	90 *	611 *	315	1,509
Gadwall	51	6	84 *	217 *	83	485
Mallard	1,447	-10 *	-7 *	8	-2	19
Teal	48	-11	59 *	-	-	-
Tufted Duck	166	14	-16	12	-23	62
Goosander	46	38	-8	-13	-41	53
Red Grouse	158	-19 *	-14	-10	-27	11
Grey Partridge	205	-5	-20 *	-63 *	-69	-54
Pheasant	2,062	-14 *	3	34 *	25	45
Indian Peafowl	46	29	-40 *	-	-	-
Red-legged Partridge	613	-21 *	7 *	26 *	9	40
Swift	1,036	-20	-39 *	-62 *	-67	-57
Cuckoo	669	-13 *	25 *	-36 *	-42	-26
Feral Pigeon	745	3	3	-15	-26	0
Stock Dove	943	4	42 *	43 *	29	60
Woodpigeon	2,803	-2	-6 *	32 *	25	38
Turtle Dove	32	11	-80 *	-97 *	-98	-96
Collared Dove	1,464	3	-28 *	-15 *	-23	-7
Moorhen	671	0	-14 *	-21 *	-30	-10
Coot	286	2	-26 *	-7	-25	17
Little Grebe	76	14	11	18	-16	65
Great Crested Grebe	76	-18	-13	-9	-41	21
Oystercatcher	387	1	-3	-20 *	-30	-8
Lapwing	678	1	-16 *	-49 *	-55	-41
Golden Plover	69	-2	-6	-16	-36	13
Curlew	532	0	-7	-49 *	-55	-42
Snipe	183	-9	8	20	-5	48
Common Sandpiper	77	2	-10	-27 *	-42	-8
Redshank	88	-5	-8	-49 *	-66	-21
(Common Tern)	68	-10	23	5	-56	96
(Cormorant)	272	-7	4	26	-12	70
(Grey Heron)	697	9	-7	-13	-24	2
(Little Egret)	67	24	80 *	2,311 *	834	>9,999
Sparrowhawk	354	8	-22 *	-25 *	-35	-14
Marsh Harrier	49	-2	1	-	-	-
Red Kite	233	17 *	144 *	2,105 *	1,225	5,381
Buzzard	1,272	-6	6 *	89 *	72	108
(Barn Owl)	53	-34 *	-26 *	185 *	104	354
Little Owl	68	-13	-40 *	-70 *	-77	-59
(Tawny Owl)	97	1	-12	-33 *	-47	-13
Kingfisher	58	67 *	24	-14	-42	33
Gt Spotted Woodpecker	1,262	-5	-3	137 *	123	160
Green Woodpecker	883	-14 *	-26 *	2	-6	12
Kestrel	682	-7	-19 *	-42 *	-49	-37
Hobby	46	17	-11	-8	-36	33
Peregrine	56	-7	-22 *	-44 *	-59	-18
Ring-necked Parakeet	100	-2	90 *	1,960 *	751	7,643
Jay	883	-9	1	21 *	12	35
Magpie	2,117	1	0	-1	-7	4
Jackdaw	2,015	-1	11 *	64 *	51	80
Rook	1,438	-5	-4	-22 *	-30	-12
Carrion Crow	2,666	-1	1	17 *	9	25
Hooded Crow	149	15	2	8	-17	43
Raven	399	-3	14	33	-8	104

Species	Min. sample	1-year (21-22)	10-year (11-21)	26-year (95-21)	LCL	UCL
Coal Tit	943	-4	-15 *	0	-11	12
Marsh Tit	150	28	-24 *	-43 *	-56	-26
Willow Tit	28	-44	-49 *	-90 *	-93	-84
Blue Tit	2,596	-5 *	-9 *	-2	-6	2
Great Tit	2,481	-2	-12 *	28 *	22	33
Skylark	1,903	0	9 *	-14 *	-19	-8
Sand Martin	149	-29 *	-13	13	-42	118
Swallow	2,154	0	-47 *	-27 *	-33	-22
House Martin	973	13	-39 *	-42 *	-48	-35
Cetti's Warbler	41	20 *	278 *	786 *	384	>9,999
Long-tailed Tit	1,102	5	-10 *	12 *	3	24
Wood Warbler	46	8	-43 *	-79 *	-87	-68
Willow Warbler	1,459	1	-11 *	-9 *	-17	-1
Chiffchaff	1,849	13 *	25 *	140 *	122	157
Sedge Warbler	316	0	-29 *	-19 *	-33	-1
Reed Warbler	146	2	5	36 *	8	74
Grasshopper Warbler	89	-13	-24 *	4	-24	54
Blackcap	1,926	3	33 *	200 *	182	218
Garden Warbler	468	4	-24 *	-32 *	-40	-22
Lesser Whitethroat	306	-6	-4	-5	-18	13
Whitethroat	1,532	1	-15 *	20 *	10	30
Goldcrest	907	14 *	4	-5	-18	12
Wren	2,762	11 *	29 *	24 *	18	30
Nuthatch	619	-7	9 *	103 *	85	138
Treecreeper	401	-2	-7	-3	-15	14
Starling	1,835	0	-8	-54 *	-58	-49
Song Thrush	2,268	0	20 *	29 *	23	36
Mistle Thrush	1,211	-16 *	-6	-34 *	-41	-27
Blackbird	2,776	-2 *	-3 *	18 *	14	22
Ring Ouzel	45	-32 *	12	-	-	-
Spotted Flycatcher	164	-13	-35 *	-68 *	-75	-61
Robin	2,673	-3 *	13 *	22 *	17	27
Nightingale	33	1	-6	-46 *	-65	-8
Pied Flycatcher	39	11	-	-56 *	-72	-27
Redstart	196	4	-21 *	2	-14	21
Whinchat	78	-8	0	-57 *	-68	-42
Stonechat	191	48 *	152 *	195 *	134	298
Wheatear	373	-9	-32 *	-30 *	-41	-16
Dipper	67	-20	-20	-47 *	-63	-24
Tree Sparrow	206	-8	-13	84 *	40	144
House Sparrow	1,787	-6 *	-2	-4	-12	4
Dunnock	2,325	-4 *	-7 *	12 *	6	19
Yellow Wagtail	169	-24 *	13	-39 *	-55	-25
Grey Wagtail	240	14	27 *	-4	-19	16
Pied Wagtail	1,377	-1	-6	-20 *	-26	-12
Meadow Pipit	879	0	7	-15 *	-22	-7
Tree Pipit	154	-1	-16	-15	-33	10
Chaffinch	2,759	-5 *	-37 *	-29 *	-34	-26
Bullfinch	703	-14 *	-12 *	-6	-15	3
Greenfinch	1,779	-3	-62 *	-68 *	-71	-65
Linnet	1,318	-13 *	0	-23 *	-30	-15
Lesser Redpoll	185	-4	-14	16	-14	61
Common Crossbill	63	18	-59 *	-23	-51	15
Goldfinch	1,994	1	22 *	152 *	134	170
Siskin	227	-19 *	-21 *	31 *	4	71
Corn Bunting	150	-7	43 *	-13	-38	16
Yellowhammer	1,258	-9 *	-16 *	-28 *	-33	-22
Reed Bunting	561	-1	7	27 *	13	43

England: population trends

Trends for 115 species have been produced for England, with one addition from last year as Goosander reaches the reporting threshold for the five-year trend. This, along with other relatively recent newcomers to published trends Teal and Firecrest, are published online. Table 4 displays the same 112 species as reported in 2021.

STATISTICALLY SIGNIFICANT RESULTS

Period	No. species	Greatest change in English trends
Long-term (95-21) increases	37	Red Kite 25,288%
Long-term (95-21) decreases	37	Turtle Dove -97%
Short-term (21-22) increases	9	Egyptian Goose 103%
Short-term (21-22) decreases	21	Great Crested Grebe -30%

CORN BUNTING & SKYLARK

The long-term decline of our farmland birds is an all too familiar story. However for **Corn Bunting** and **Skylark**, there is cause for optimism. Both species have significant positive five-year trends in England. Corn Bunting has particularly increased in England in the last two years (Figure 9a) but there are longer-term increases in the south-west (Figure 9b); there has been a 123% increase in the last 10 years in this region. The Corn Bunting recovery in the south-west may be linked to concerted Agri-environment Scheme (AES) management programmes in key areas here, but this will be clarified by further analyses of BBS and AES data following those from Baker *et al.* (2012).

Skylark is more widely distributed across Britain but has shown an increase of 10% in both England (Figure 8) and Scotland over the last five years, with a 9% increase in England over 10 years. Within the English regions, the rate of this recent increase is varied, with some regions experiencing increases over 10 years (e.g., 20% in East Midlands) or more recently (e.g., 18% in south-east England over five years).

Both species, however, still record long-term declines since 1995 (14% Skylark, 13% Corn Bunting) and even greater declines since the 1960s (including CBC data). Furthermore, the situation for Skylark is still very variable between UK countries, with declines still evident across Wales with a five year decline of 24%.

BLACKBIRD

Small declines at any spatial scales can often be overlooked. However, if sustained for long periods, this can often lead to more dramatic long-term changes in population. There are signs that **Blackbird**, the third most widely distributed species across the survey in the UK, may be showing such a decline. Whilst there is still a long-term increase in England (and indeed the UK) since the start of the survey (12%), there has been a significant decline over the last 10 (6%) and five (4%) years.

When the trends within each English region are explored, there is a clear difference between London and the remaining regions (Figure 10). This long-term decline (55% over 26 years) is in stark contrast to other regions where the trend is either stable or increasing. Whilst the cause of this long-term trend is unknown, the relatively sharp decline from 2019–21, and continued in 2022 may be linked to the association of Blackbird and the Usutu virus; the lineage “USUV lineage Africa 3.2” was first detected in August 2020 in Blackbirds in London (Lawson *et al.* 2022).

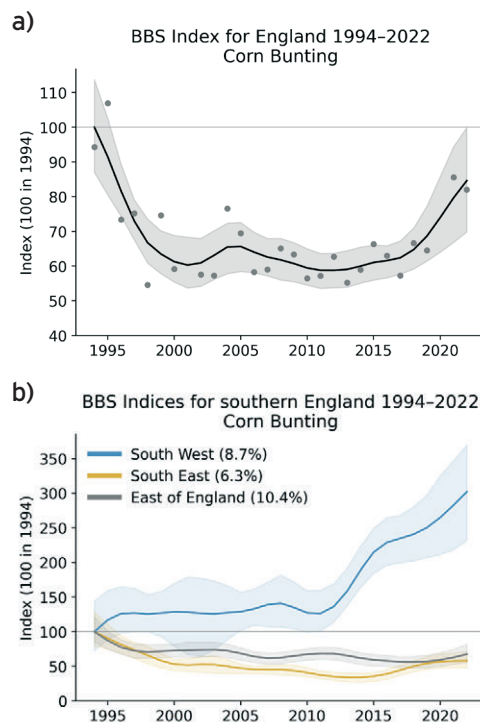


Figure 9: Corn Bunting population change in England (a) and regions of southern and eastern England (b).

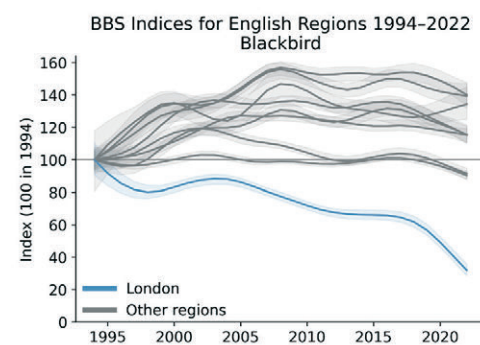


Figure 10: Blackbird declines are particularly notable in London, compared with other English regions.

FIND OUT MORE...

Baker, D.J., Freeman, S.N., Grice, P.V. & Siriwardena, G.M. 2012. Landscape-scale responses of birds to agri-environment management: a test of the English Environmental Stewardship scheme, *Journal of Applied Ecology* **49**: 871–882.

Lawson, B., Robinson, R.A., Briscoe, A.G., *et al.* 2022. Combining host and vector data informs emergence and potential impact of an Usutu virus outbreak in UK wild birds. *Scientific Reports* **12**: 10298

Table 4: Trends in England during 2021-22, 2011-21 and 1995-2021.

Species	Min. sample	1-year (21-22)	10-year (11-21)	26-year (95-21)	LCL	UCL
Canada Goose	518	4	33 *	96 *	38	182
Greylag Goose	247	17	32 *	347 *	171	821
Mute Swan	237	-5	19	34 *	5	121
Egyptian Goose	34	103 *	53 *	1,713 *	530	>9,999
Shelduck	126	-25	-1	28	-33	72
Mandarin Duck	38	-18	82 *	620 *	276	1,771
Gadwall	48	-3	71 *	189 *	47	451
Mallard	1,203	-7	-10 *	13 *	1	24
Tufted Duck	142	-1	-24 *	-2	-30	29
Red Grouse	88	-12 *	-5	4	-25	45
Grey Partridge	180	-2	-21 *	-60 *	-67	-52
Pheasant	1,722	-15 *	6 *	38 *	28	49
Indian Peafowl	43	30	-36	-	-	-
Red-legged Partridge	591	-24 *	8	21 *	7	35
Swift	892	-28	-40 *	-62 *	-68	-57
Cuckoo	441	-6	-15 *	-71 *	-75	-68
Feral Pigeon	602	1	11 *	-17 *	-27	-4
Stock Dove	869	5	46 *	43 *	28	60
Woodpigeon	2,227	-3	-7 *	35 *	28	42
Turtle Dove	32	12	-80 *	-97 *	-98	-95
Collared Dove	1,265	6 *	-32 *	-20 *	-26	-13
Moorhen	619	-2	-18 *	-25 *	-32	-15
Coot	258	3	-21 *	-4	-23	23
Little Grebe	59	29	12	8	-33	69
Great Crested Grebe	69	-30 *	-5	-16	-38	19
Oystercatcher	219	10	0	50 *	27	86
Lapwing	569	1	-16 *	-36 *	-46	-26
Golden Plover	28	-23	-28 *	-	-	-
Curlew	347	-4	2	-30 *	-42	-17
Snipe	96	-9	50 *	26	-9	77
Common Sandpiper	33	2	0	-31	-59	1
Redshank	62	-5	-22	-45 *	-64	-18
(Common Tern)	63	10	22	67	-28	159
(Cormorant)	227	8	7	23	-1	58
(Grey Heron)	569	5	-6	-19 *	-30	-3
(Little Egret)	61	24	74 *	2,088*	683	>9,999
Sparrowhawk	292	-1	-26 *	-32 *	-41	-23
Marsh Harrier	42	2	0	-	-	-
Red Kite	184	21 *	187 *	25,289*	>9,999	>9,999
Buzzard	899	-2	18 *	214 *	171	271
(Barn Owl)	51	-29 *	-21 *	198 *	98	416
Little Owl	66	-12	-39 *	-69 *	-77	-60
(Tawny Owl)	84	-14	-11	-23	-39	0
Kingfisher	52	62 *	-1	-21	-46	11
Gt Spotted Woodpecker	1,087	-7 *	-7 *	105 *	90	120
Green Woodpecker	828	-16 *	-26 *	10	0	21
Kestrel	604	-8	-16 *	-29 *	-36	-20
Hobby	44	13	-14	-7	-39	29
Peregrine	35	30	-10	31	-24	159
Ring-necked Parakeet	100	-2	90 *	1,960 *	903	>9,999
Jay	755	0	-7 *	2	-5	12
Magpie	1,763	0	4 *	1	-4	7
Jackdaw	1,622	-4	20 *	82 *	66	95
Rook	1,149	-8	0	-10	-19	1
Carrion Crow	2,180	-3	3	25 *	14	34
Raven	198	-4	19	29	-42	350
Coal Tit	631	-12 *	-11 *	14 *	1	32
Marsh Tit	137	4	-26 *	-46 *	-58	-35
Willow Tit	24	-52	-50 *	-90 *	-94	-83
Blue Tit	2,098	-5 *	-8 *	-2	-5	1
Great Tit	1,998	-3 *	-12 *	23 *	17	27
Skylark	1,509	2	8 *	-16 *	-21	-11
Sand Martin	89	-8	-1	-6	-35	41
Swallow	1,643	0	-52 *	-34 *	-39	-28
House Martin	742	8	-44 *	-55 *	-61	-48
Cetti's Warbler	38	22 *	291 *	640 *	277	7,630
Long-tailed Tit	971	7	-13 *	5	-5	18
Willow Warbler	940	7	-24 *	-47 *	-54	-41
Chiffchaff	1,539	13 *	22 *	133 *	118	148
Sedge Warbler	198	-3	-26 *	-26 *	-44	-2
Reed Warbler	138	2	5	34 *	6	71
Grasshopper Warbler	41	19	-24	-34	-59	4
Blackcap	1,620	2	30 *	161 *	147	178
Garden Warbler	378	2	-23 *	-38 *	-47	-29
Lesser Whitethroat	293	-6	-1	-2	-16	13
Whitethroat	1,309	-1	-15 *	17 *	9	26
Goldcrest	654	9 *	4	17 *	3	38
Wren	2,146	9 *	26 *	22 *	18	28
Nuthatch	529	-6	12 *	116 *	94	145
Treecreeper	298	12	-8	-8	-22	5
Starling	1,483	-6	-11 *	-62 *	-65	-58
Song Thrush	1,764	-1	12 *	23 *	16	31
Mistle Thrush	943	-9	-17 *	-48 *	-52	-43
Blackbird	2,200	-4 *	-6 *	12 *	7	16
Ring Ouzel	26	-30	24	-	-	-
Spotted Flycatcher	104	-14	-39 *	-75 *	-80	-68
Robin	2,104	-4 *	14 *	30 *	25	36
Nightingale	33	1	-6	-44	-65	5
Redstart	108	10	-5	-3	-25	27
Whinchat	29	6	-25 *	-57 *	-74	-35
Stonechat	79	32 *	172 *	218 *	116	397
Wheatear	202	-29 *	-41 *	-26	-46	2
Dipper	31	16	-37 *	-62 *	-80	-22
Tree Sparrow	156	-19 *	-23 *	31	-2	70
House Sparrow	1,442	-7 *	-5	-17 *	-22	-9
Dunnock	1,885	-4 *	-7 *	7 *	2	15
Yellow Wagtail	165	-23 *	14	-39 *	-49	-24
Grey Wagtail	162	16	16	5	-13	31
Pied Wagtail	1,032	3	0	-17 *	-23	-10
Meadow Pipit	453	-8 *	-11 *	-22 *	-32	-12
Tree Pipit	72	35	-43 *	-69 *	-81	-49
Chaffinch	2,137	-8 *	-44 *	-38 *	-41	-35
Bullfinch	539	-13 *	-19 *	-16 *	-25	-8
Greenfinch	1,508	1	-59 *	-66 *	-68	-63
Linnet	1,064	-10 *	-3	-27 *	-34	-19
Lesser Redpoll	68	-40	-27	-22	-55	28
Crossbill	33	-22	-60 *	-	-	-
Goldfinch	1,635	2	22 *	143 *	129	164
Siskin	86	1	0	67	-14	298
Corn Bunting	142	-4	35 *	-13	-37	22
Yellowhammer	1,090	-6	-15 *	-34 *	-40	-28
Reed Bunting	421	-4	3	32 *	13	51

Scotland: population trends

Trends for 69 species are presented in this report for Scotland. This includes a new 10-year trend for Spotted Flycatcher, which was hitherto only reported online with a five-year trend. Jay also sees the first all-time trend for Scotland as its average sample size in Scotland has steadily grown. With Mute Swan, Canada Goose (both new additions), Sparrowhawk and Whinchat also having five-year trends, the total number of species with trends available online is 73.

STATISTICALLY SIGNIFICANT RESULTS

Period	No. species	Greatest change in Scottish trends	
Long-term (95-21) increases	23	Chiffchaff	1,018%
Long-term (95-21) decreases	14	Greenfinch	-71%
Short-term (21-22) increases	3	Stonechat	83%
Short-term (21-22) decreases	11	Sand Martin	-41%

BUZZARD

Buzzard has previously been highlighted in these pages for its large increases, particularly at UK-level and at England-level. Much of this increase is due to its successful recolonisation in England, where long-term persecution had largely confined its population to Scotland and Wales. In both Scotland and Wales there are signs of stabilisation, or even a gradual decline (Figure 11). It is possible that the reported 22% one-year decline may indicate an impact of mortality caused by HPAI. This will be something to keep watch over in 2023.

A TALE OF TWO WARBLERS

Willow Warbler has an even more pronounced difference in population trend, with increases in Scotland contrasting with steep declines in England (Figure 12). Research published in 2022 showed that Willow Warbler growth in Scotland and decline in England was directly attributable to climate change (Martay *et al.* 2022); as conditions that best match the climatic optimum for Willow Warbler have moved northwards with a warming climate, so too has their distribution.

By contrast, **Chiffchaff** is increasing in both Scotland (1,018% over 26 years) and England (133%). As well as having a different migratory behaviour from Willow Warbler, Chiffchaff also appear to favour slightly warmer conditions,

explaining its increasing trends in both England and Scotland.

RED GROUSE

Red Grouse shows short-term (one-year) declines of 22%. Whilst non-significant, this does highlight the existence of a significant 33% decline over the last 5 years. This comes as part of a regular cyclical pattern of population change (see Newton, 2020 and references therein; Figure 13).

NEW TRENDS

We are now able to report on trends for **Jay** and **Mute Swan**. Jay has been steadily increasing in Scotland since the beginning of BBS in 1994. For the first time the minimum sample size deemed appropriate for reporting has been reached (an average of 30 or more squares over the period of the survey). Jay have increased in Scotland by 463% over the course of the survey.

Meanwhile, Mute Swan reaches the reporting threshold for the

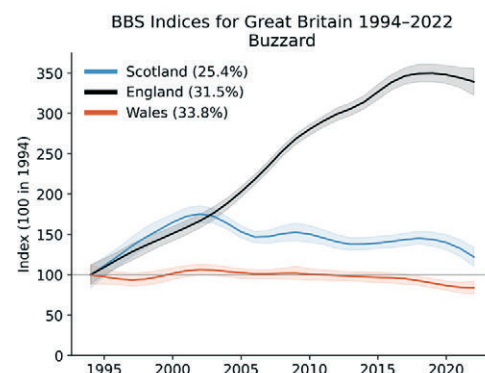


Figure 11: Buzzard expansion in England appears to be stabilising, whereas there are signs of long-term decline in Scotland and Wales.

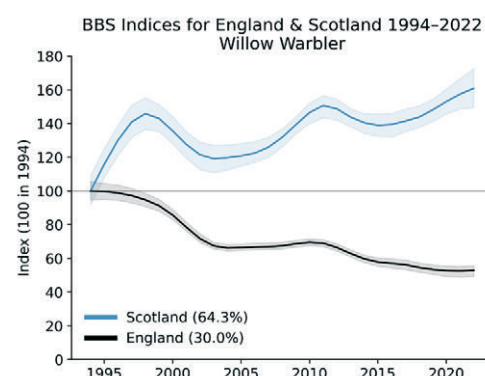


Figure 12: Willow warbler is profiting in Scotland from a warming climate, but showing long-term decline in England.

five-year trend for the first time; these are available online only. In Scotland, they have declined by 32% in the last five years, as well as a non-significant decline of 23% in the last year. Given the concerns of how wildfowl will be impacted by HPAI, this will be an area to keep a close eye on in subsequent years.

FIND OUT MORE...

Martay, B., Pearce-Higgins, J.W., Harris, S.J. & Gillings, S. 2022. Breeding ground temperature rises, more than habitat change, are associated with spatially variable population trends in two species of migratory bird. *Ibis* 165: 34–54 DOI: <https://doi.org/10.1111/ibi.13101>

Newton, I. 2020 *Uplands and Birds*. Collins New Naturalist Library, Harper Collins, London.

Table 5: Trends in Scotland during 2021-22, 2011-21 and 1995-2021.

Species	Min. sample	1-year (21-22)	10-year (11-21)	26-year (95-21)	LCL	UCL
Greylag Goose	41	14	-6	105	-41	652
Mallard	124	-21 *	-6	-19	-34	2
Red Grouse	63	-22	-16	-17	-36	4
Pheasant	170	-12	-8	9	-13	35
Swift	57	39 *	-14	-58 *	-71	-40
Cuckoo	95	-21 *	60 *	59 *	30	103
Feral Pigeon	77	-4	-24 *	-11	-43	48
Stock Dove	33	-35	8	-	-	-
Woodpigeon	253	-3	-8	2	-17	25
Collared Dove	64	-20	-4	4	-39	75
Oystercatcher	146	0	-7	-36 *	-49	-21
Lapwing	84	2	-17	-62 *	-73	-51
Golden Plover	42	2	6	-15	-38	10
Curlew	133	3	-15	-60 *	-69	-51
Snipe	70	-10	-2	17	-14	56
Common Sandpiper	39	3	-11	-26 *	-44	-3
(Grey Heron)	59	21	-4	1	-25	44
Buzzard	173	-22 *	-9	19	-1	53
Gt Spotted Woodpecker	72	-8	9	414 *	270	709
Kestrel	36	-30	-31	-69 *	-81	-53
Jay	30	-18	48 *	463 *	262	1,099
Magpie	69	8	38 *	81 *	42	151
Jackdaw	148	7	12	51 *	14	94
Rook	127	-6	-1	-38 *	-54	-18
Carrion Crow	236	-4	-7	-4	-20	19
Hooded Crow	58	23	-27	-42 *	-62	-13
Raven	67	-11	25	40	-4	117
Coal Tit	159	2	-13	-5	-22	19
Blue Tit	200	-7	-3	7	-6	27
Great Tit	193	-2	-7	46 *	18	74
Skylark	248	-2	16	-5	-14	7
Sand Martin	40	-41 *	-8	47	-37	436
Swallow	213	-1	-37 *	-8	-24	15
House Martin	83	6	-28 *	45 *	3	132
Long-tailed Tit	40	-7	46 *	106 *	38	246

Species	Min. sample	1-year (21-22)	10-year (11-21)	26-year (95-21)	LCL	UCL
Willow Warbler	256	-3	4	36 *	17	54
Chiffchaff	90	7	127 *	1,018 *	573	1,825
Sedge Warbler	64	9	-28 *	5	-27	48
Blackcap	94	20	65 *	664 *	401	1,032
Garden Warbler	34	8	-18	-	-	-
Whitethroat	104	7	-7	116 *	48	190
Goldcrest	106	21	-6	-5	-31	24
Wren	275	31 *	35 *	42 *	24	62
Treecreeper	45	-34 *	-3	-1	-34	39
Starling	172	11	-3	-31 *	-44	-14
Song Thrush	219	2	42 *	38 *	18	62
Mistle Thrush	92	-34 *	23	16	-19	69
Blackbird	241	-2	0	29 *	10	55
Spotted Flycatcher	30	22	-44 *	-	-	-
Robin	240	1	3	12	-2	27
Stonechat	49	83 *	165 *	147 *	70	317
Wheatear	96	3	-29 *	-31 *	-45	-10
Tree Sparrow	37	-14	52 *	450 *	131	1,370
House Sparrow	123	-12	9	46 *	15	88
Dunnock	170	-17 *	-20 *	26 *	5	50
Grey Wagtail	35	35	25	-16	-44	19
Pied Wagtail	157	-12	-18	-30 *	-44	-15
Meadow Pipit	254	2	15 *	-14 *	-23	-3
Tree Pipit	44	-7	1	75 *	33	136
Chaffinch	288	-5	-26 *	-10	-20	2
Bullfinch	55	-19	8	42 *	3	111
Greenfinch	107	-30 *	-62 *	-71 *	-78	-62
Linnet	104	-32 *	20	6	-24	39
Lesser Redpoll	61	7	10	40	-11	109
Crossbill	31	40	-57 *	-	-	-
Goldfinch	132	-8	31 *	234 *	159	342
Siskin	93	-26 *	-31 *	13	-9	53
Yellowhammer	129	-20 *	-14	13	-4	36
Reed Bunting	76	9	32 *	57 *	26	111

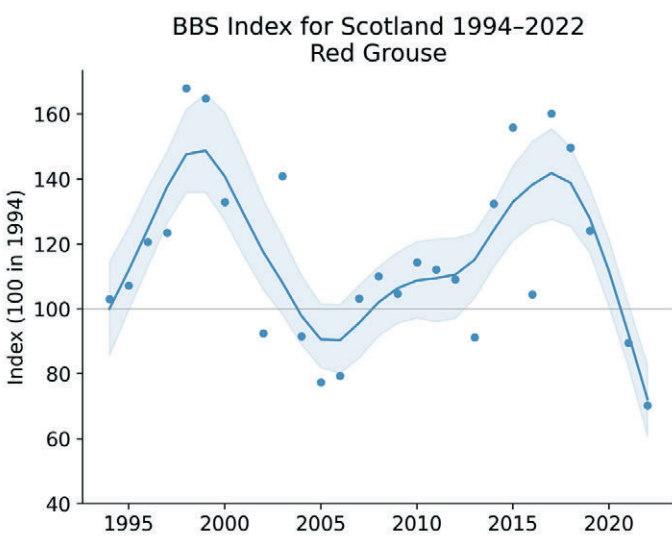


Figure 13: Red Grouse show cyclical patterns of population growth and decline.

▲ Jay reaches the threshold for reporting for all-time trends for the first time.

Wales: population trends

Trends for 60 species are reported for Wales, the same as for 2021 and over the same time periods. Yellowhammer moves ever closer to being below the all-time reporting threshold for Wales. However, as it has always featured in this report, it will continue to do so.

STATISTICALLY SIGNIFICANT RESULTS

Period	No. species	Greatest change in Welsh trends*	
Long-term (95-21) increases	19	Canada Goose	459%
Long-term (95-21) decreases	18	Greenfinch	-80%
Short-term (21-22) increases	5	Rook	60%
Short-term (21-22) decreases	1	Siskin	-33%

* Species are colour coded by BoCC4 Wales assessment.

BOCC4 WALES

The latest *Birds of Conservation Concern for Wales* (BoCC4 Wales) was published in December 2022 (Johnstone *et al.* 2022). The 220 regularly occurring species in Wales were assessed using standardised criteria and a range of datasets, including BBS. There are now 60 species (27%) on the Red List, 91 (41%) on the Amber List and 69 (31%) on the Green List. There are five more Red-listed species than in the previous review; three have moved from Green to Red, 10 from Amber to Red, while one newly assessed species was Red-listed. Seven previously Red species have been moved to Amber, and 14 moved from Amber to Green.

ROOKS GETTING RARER

Of perhaps the greatest concern was the change of status for **Rook** which, like **Greenfinch** in the UK BoCC5 assessment (Stanbury *et al.* 2021) moved directly from Green to Red. Rook have been declining across the UK for the last 26 years and were moved to Amber at the UK level. However, those declines have been particularly marked in Wales, where there has been a 61% decline in since 1995 and a 50% decline in the last 10 years. The period 2010–15 saw a particularly accelerated rate of decline (Figure 14). However, these declines are not unique to Wales; an earlier decline is evident across Scotland (38% since 1995) and declines are found across Europe as well (Keller *et al.* 2020).

An all-Wales breeding Rook survey, run by the Welsh Ornithological

Society was conducted in 2022–23. A new population estimate will be available towards the end of 2023 once all data has been entered online, validated and made available for analysis. Further details are available via the WOS website: <https://birdsin.wales/rook-survey>

OTHER SPECIES

Other changes to conservation status are evident in the trends. **Goldcrest**, and **Tree Pipit** both moved from Amber to Red in the latest BoCC4 Welsh assessment and show long-term declines of 49% and 35% respectively. **Magpie** also, whilst on the rise in Scotland and relatively unchanged in England, have declined by 25% in Wales since BBS began.

By contrast, **Red Kite**, with Wales as its former refuge following historic persecution, moves from Amber to Green with a more than five-fold increase in Wales.

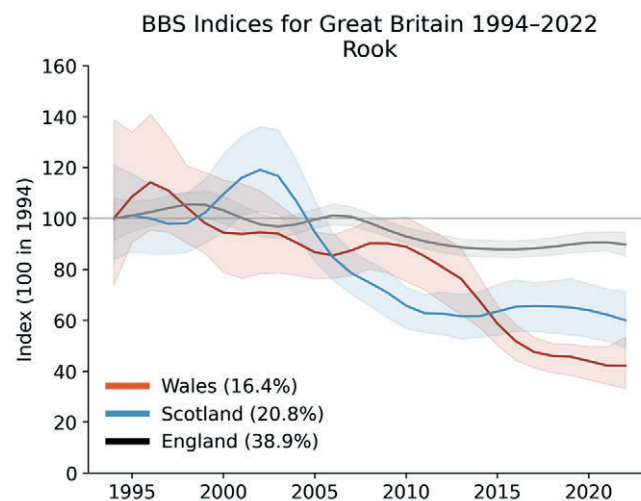


Figure 14: Rook is declining in all countries in Great Britain, but has done so particularly markedly in Wales over the last 10 years.

Multi-region/country graphs represent relative changes over time and are not changes in population size estimates. See Page 15.



▲ Rook was moved from Green to Red on the recent BoCC4 Wales assessment.

Table 6: Trends in Wales during 2021-22, 2011-21 and 1995-2021.

Species [†]	Min. sample	1-year (21-22)	10-year (11-21)	26-year (95-21)	LCL	UCL
Canada Goose	36	21	44 *	459 *	168	1,372
Mallard	76	-11	15	-3	-48	64
Pheasant	110	-2	11	37	-8	96
Swift	65	-13	-55 *	-74 *	-83	-60
Cuckoo	66	8	49 *	1	-28	42
Feral Pigeon	40	20 *	8	40 *	2	104
Stock Dove	37	12	6	83 *	11	231
Woodpigeon	214	10	-5	28 *	9	50
Collared Dove	83	5	-8	24	-14	76
Curlew	31	9	-40 *	-73 *	-83	-61
(Grey Heron)	45	4	21	-4	-48	50
Red Kite	36	37 *	76 *	423 *	175	1,097
Buzzard	159	17	-15 *	-13	-29	2
Gt Spotted Woodpecker	100	4	10	226 *	157	333
Green Woodpecker	47	12	-20	-39 *	-58	-13
Jay	85	-30	8	44 *	4	102
Magpie	180	6	-11	-25 *	-35	-8
Jackdaw	158	6	-16	8	-29	86
Rook	82	60 *	-50 *	-61 *	-74	-47
Carrion Crow	231	19 *	0	9	-10	28
Raven	107	9	-8	18	-23	77
Coal Tit	85	0	-22 *	-31 *	-49	-3
Blue Tit	201	-2	-21 *	-6	-18	6
Great Tit	193	6	-20 *	24 *	6	44
Skylark	114	-6	-18	-27	-45	0
Swallow	192	9	-46 *	-26 *	-39	-11
House Martin	92	15	-56 *	-49 *	-63	-29
Long-tailed Tit	69	9	-33 *	-11	-35	21
Willow Warbler	175	0	-20 *	-19 *	-33	-5
Chiffchaff	168	16 *	3	78 *	48	118

Species [†]	Min. sample	1-year (21-22)	10-year (11-21)	26-year (95-21)	LCL	UCL
Blackcap	151	-5	20 *	191 *	141	258
Garden Warbler	62	7	-29 *	-34 *	-56	-7
Whitethroat	95	0	-28 *	-28 *	-46	-8
Goldcrest	94	7	9	-49 *	-64	-22
Wren	225	7	38 *	25 *	10	41
Nuthatch	83	-6	-12	35 *	8	70
Treecreeper	45	9	4	4	-31	52
Starling	84	2	21	-64 *	-78	-48
Song Thrush	189	-4	20 *	32 *	18	55
Mistle Thrush	113	-9	16 *	8	-14	40
Blackbird	224	2	8 *	49 *	37	66
Robin	218	-3	22 *	5	-5	16
Redstart	71	-9	-33 *	-6	-25	15
Stonechat	49	19	116 *	306 *	174	610
Wheatear	60	-13	-21	-28 *	-44	-7
House Sparrow	145	9	6	98 *	65	153
Duncock	178	4	6	35 *	13	59
Grey Wagtail	35	-9	42	-	-	-
Pied Wagtail	133	13	4	-5	-24	18
Meadow Pipit	102	-4	-10	-16	-37	7
Tree Pipit	37	8	-30 *	-35 *	-58	-3
Chaffinch	221	3	-40 *	-42 *	-50	-33
Bullfinch	71	-22	-1	-6	-29	23
Greenfinch	103	3	-77 *	-80 *	-86	-72
Linnet	103	22	10	-21	-41	16
Lesser Redpoll	39	22	-18	-	-	-
Goldfinch	155	12	14	102 *	60	154
Siskin	36	-33 *	49	158 *	59	431
Yellowhammer	30	4	-	-79 *	-90	-69
Reed Bunting	32	0	-6	24	-25	116

† Species are colour coded by BoCC4 Wales assessment. All other tables are colour coded by the UK BoCC5 assessment.



▲ Tree Pipit and Magpie were amongst the species whose conservation status in Wales moved to a greater level of concern.

FIND OUT MORE...

Johnstone, I.G., Hughes, J., Balmer, D.E., *et al.* 2022. Birds of Conservation Concern Wales 4: the population status of birds in Wales. *Milvus the Journal of the Welsh Ornithological Society* **2**: 1–34. Available at: <https://tinyurl.com/BoCCW4>

Keller, V., Herrando, S., Voríšek, P., *et al.* 2020. *European Breeding Bird Atlas 2: Distribution, Abundance and Change*. European Bird Census Council & Lynx Edicions, Barcelona. <https://ebba2.info/>

Stanbury, A.J., Eaton, M.A., Aebischer, N.J., *et al.* 2021. The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. *British Birds* **114**: 723–747.

Northern Ireland: population trends

Trends for 38 species continue to be published for Northern Ireland, as was the case in 2021. Feral Pigeon is reported online only with a five-year trend, whereas a 10-year Skylark trend continues to be published, even though it currently falls below the reporting threshold; another example of a historically more widespread but declining species.

STATISTICALLY SIGNIFICANT RESULTS

Period	No. species	Greatest change in Northern Irish trends*	
Long-term (95-21) increases	14	Blackcap	1,811%
Long-term (95-21) decreases	2	Greenfinch	-84%
Short-term (21-22) increases	1	Blackbird	12%
Short-term (21-22) decreases	1	Sedge Warbler	-47%

BLACKBIRD

Blackbird appears to be doing well in Northern Ireland with a 19% increase over 10 years (Figure 15), contrasting with the more recent downward trends seen in England (see Page 18). A similar picture is seen in Wales, where an 8% increase has been observed over the last 10 years.

COLLARED DOVE

Collared Dove is a species that has declined in recent years following a steady increase. The overall UK trend since the start of BBS in 1994 is one of decline, with the UK population approximately four-fifths of its 1994 baseline (Table 3). However, this masks a more drastic

decline over the past 15 years since a peak at around 2005. This decline has been attributed to the increase in **Woodpigeon**, a potential competitor for food and nest sites. Trichomonosis, the parasite most recently implicated in the declines of **Greenfinch** and **Chaffinch**, is also prevalent in Collared Dove and is therefore also a strong candidate as a cause for its more recent decline. In Northern Ireland, however, that decline has not been seen, though there are signs that a more acute decline may also be in progress, with a non-significant 10% decline observed over the last five years (Figure 16).

Declines in **Sedge Warbler** in Northern Ireland are also significant over the short- and medium-term, with declines of 47% and 52% respectively. There



are also hints of a decline in **Reed Bunting**, another species with similar habitat associations to Sedge Warbler. However, whilst the figures for change indicate a decline, there is less certainty over these changes. Nevertheless, the similarity of habitat between these two species highlights the ongoing concerns for our rivers and wetlands across the UK.

Table 7: Trends in Northern Ireland during 2021-22, 2011-21 and 1995-2021.

Species	Min. sample	1-year (21-22)	10-year (11-21)	26-year (95-21)	LCL	UCL
Mallard	31	-3	-3	204 *	1	405
Pheasant	45	10	-23 *	94 *	12	315
Woodpigeon	91	-1	11 *	115 *	63	186
Collared Dove	40	-7	-3	69	-2	325
Buzzard	37	-17	13	1,232 *	564	3,862
Magpie	88	-5	-21 *	-9	-30	16
Jackdaw	83	2	-13	58 *	17	127
Rook	77	8	-5	-12	-40	23
Hooded Crow	88	5	30 *	187 *	110	301
Coal Tit	68	-12	-30 *	21	-12	84
Blue Tit	83	-3	-4	-5	-30	23
Great Tit	80	-1	-12 *	124 *	76	177
Skylark	26	25	17	-41 *	-61	-21
Swallow	89	-6	-35 *	-31	-46	2
House Martin	49	54	-11	60	-12	186
Willow Warbler	85	2	-28 *	34 *	12	65
Chiffchaff	39	14	-10	23	-9	77
Sedge Warbler	30	-47 *	-52 *	-	-	-
Blackcap	49	10	55 *	1,811 *	1,234	3,328

Species	Min. sample	1-year (21-22)	10-year (11-21)	26-year (95-21)	LCL	UCL
Goldcrest	49	21	35 *	39	-2	118
Wren	98	2	32 *	53 *	13	108
Starling	84	1	-7	13	-14	62
Song Thrush	84	-1	37 *	72 *	28	132
Mistle Thrush	60	-17	-17	-29	-61	35
Blackbird	92	12 *	19 *	50 *	22	82
Robin	94	-5	14 *	18	-4	39
House Sparrow	62	-11	2	38	-11	140
Dunnock	76	3	3	56 *	6	118
Pied Wagtail	51	18	-3	26	-18	116
Meadow Pipit	65	0	34 *	2	-24	54
Chaffinch	96	-5	-22 *	14	-9	34
Bullfinch	36	3	-16	-4	-36	36
Greenfinch	34	-13	-80 *	-84 *	-91	-71
Linnet	37	-36	-47 *	-29	-55	17
Lesser Redpoll	28	-34	-62 *	-37	-72	50
Goldfinch	58	2	4	505 *	281	1,423
Reed Bunting	32	-23	-22	-42	-64	13

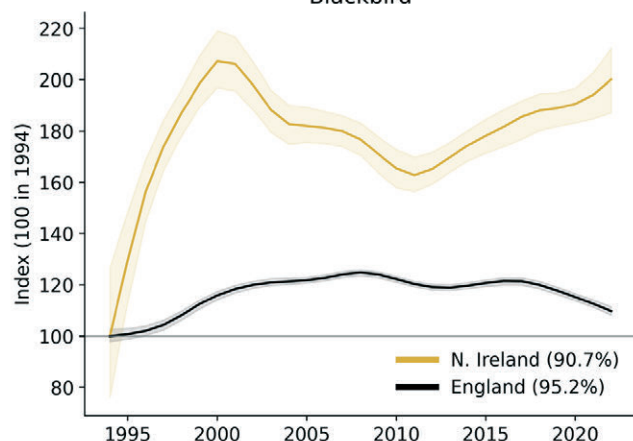
BBS Indices for England & N. Ireland 1994–2022
Blackbird

Figure 15: Contrary to the slow, recent downward trend in England, Blackbird in Northern Ireland is on the increase.

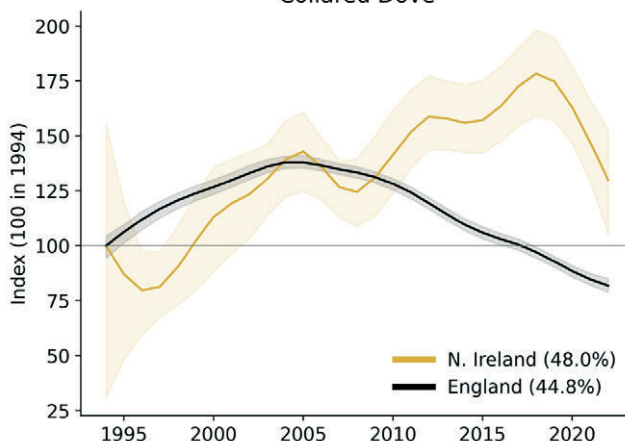
BBS Indices for England & N. Ireland 1994–2022
Collared Dove

Figure 16: The ongoing decline of Collared Dove in England has not been seen in Northern Ireland, though signs of a more recent decline are present.

Channel Islands

Nineteen squares were surveyed on the Channel Islands in 2022. These data, and those from the Isle of Man, feed into the trends for the UK.

Twelve volunteers surveyed the 16 squares covered on the Channel Islands in 2022. The result was data collection for 77 bird species.

Of these, the most numerous were **Herring Gull** with 441 individuals counted, **House Sparrow** with 382 counted and **Carriion Crow** with a total count of 310 individuals.

The most widespread species were **Woodpigeon**, **Magpie**, **Carriion Crow**, **Wren**, **Blackbird**, **Pheasant** and **Dunnock**, all of which were seen on 100% of squares covered in either or both of the Early and Late visits. The rarest encounters included single individuals of **Lapwing**, **Snipe**, **Fulmar**, **Willow Warbler**, **Reed Warbler** and **Cirl Bunting**.

This is the first ever BBS record for Cirl Bunting on Jersey, some 11 years after their return in 2011 after an eight year absence (Birds On The Edge, 2020), and the only record of this species on BBS outside of Devon.

FIND OUT MORE...

Birds On The Edge 2020. *Birds On The Edge – Jersey's Cirl Buntings in Spring 2020.* Birds on the Edge – a partnership between Durrell, States of Jersey Dept. of the Environment & National Trust for Jersey. <http://www.birdsontheedge.org> [Accessed 15/03/2023]

Isle of Man

Record coverage was achieved again on the Isle of Man in 2022 with 10 squares surveyed as was the case in 2021.

Nine volunteers once again surveyed the 10 sites on the Isle of Man and counted 359 **Herring Gulls**, 100 **Meadow Pipits**, 97 **Jackdaws** and 66 **Chaffinch** – making these the most numerous species on Isle of Man BBS squares.

No single species was seen on all 10 squares, though Herring Gull and Woodpigeon came close, being seen on nine.

2022 saw the first record of **Red Grouse** on a BBS survey on the Isle of Man. **Grasshopper Warbler** was also recorded, the first on a BBS square on the island since 2003.



English regions: population trends

A total of 80 species have reported trends in at least one English region. 2022 sees a return of Spotted Flycatcher to the species included in the published trends and Grey Partridge returns in two extra regions.

HISTORICAL TRENDS

Given the vast number of trends calculated across each of the nine regions it hasn't been practical to adhere to the same rule of maintaining trend publication where historical samples sizes were once greater than the threshold. However, this year, we have been able to welcome back **Spotted Flycatcher** in three regions (last seen in the 2012 report), and **Grey Partridge** in two additional regions. Both are now well below the reporting threshold in these areas, but serve as a reminder of their long term declines.

As ever, more five- and 10-year trends are available for species and region combinations are available online. For example, **Red Kite**, with its huge expansion across England has five- and 10-year trends in the East Midlands and the South-West in addition to those in the East of England and South-East.

PARAKEETS

Ring-necked Parakeet has increased by 90% in England over the last 10 years. The species is currently only reported in the South East and London, where this species is a common sight. Whilst not yet at the reporting threshold for publication, Ring-necked Parakeet is spreading more widely in the East of England, particularly in Hertfordshire and with populations also known in the

Peterborough area. Whilst it may be some time before Ring-necked Parakeet reaches the all-time reporting threshold in other parts of England, it won't be long before five-year trends are available in this part of the country.

GREEN WOODPECKER

Green Woodpecker has undergone impressive increases across England over the course of the combined CBC and BBS surveys (Figure 18). Indeed, the long term trend across the English regions remains favourable. However, there is a concerning decline dating back to around 2007/08, returning to levels seen at the start of BBS. The pattern across the English regions is largely similar, with the exception of the East Midlands which has seen

relative stability across the last 10 years. Little is known of the cause of the more recent decline; areas for further investigation would include availability of favoured invertebrate (especially ant) prey or availability of nest sites. Why the East Midlands would also show a deviation from the national trend is similarly unknown.

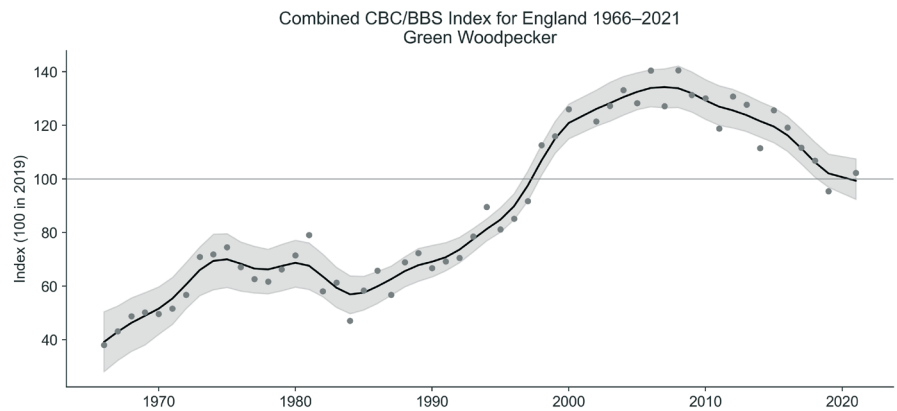


Figure 17: Green Woodpecker had increased impressively in England since the 1960s, but has been declining since around 2008 (from combined CBC/BBS data).

Table 8: Counties in each region, coverage in 2022, trends produced and statistically significant changes.

Region	Counties	Number of squares covered in 2022	No. of trends	Significant increases	Significant declines
1 North West	Cheshire, Cumbria, Lancashire, Greater Manchester, Merseyside	212	58	18	20
2 North East	Cleveland, County Durham, Northumberland	157	40	8	9
3 Yorkshire & Humber	East Yorkshire, North Lincolnshire, North Yorkshire, South Yorkshire, West Yorkshire	267	56	23	12
4 East Midlands	Derbyshire, Northamptonshire, Leicestershire & Rutland, Lincolnshire, Nottinghamshire	268	58	22	15
5 East of England	Bedfordshire, Cambridgeshire, Essex, Hertfordshire, Norfolk, Suffolk	361	70	20	21
6 West Midlands	Birmingham, Herefordshire, Shropshire, Staffordshire, Warwickshire, Worcestershire	199	55	21	15
7 South East	Berkshire, Buckinghamshire, Hampshire, Isle of Wight, Kent, Oxfordshire, Surrey, Sussex	726	70	20	30
8 South West	Avon, Cornwall, Devon, Dorset, Gloucestershire, Somerset, Wiltshire	540	63	14	21
9 London	Greater London	91	27	11	9

Table 9: Trends in English regions during 1995-2021.

Species	North West		North East		Yorkshire & Humber		East Midlands		East of England		West Midlands		South East		South West		London	
	95-21	Sample	95-21	Sample	95-21	Sample	95-21	Sample	95-21	Sample	95-21	Sample	95-21	Sample	95-21	Sample	95-21	Sample
Canada Goose	139 *	74	-	-	236 *	36	43	47	29	61	54 *	73	50 *	133	237	57	-	-
Greylag Goose	-	-	-	-	957 *	48	689 *	37	178 *	54	-	-	105	46	-	-	-	-
Mute Swan	-	-	-	-	-	-	-	-	251 *	43	-	-	-37	59	9	39	-	-
Shelduck	-	-	-	-	-	-	-	-	5	37	-	-	-	-	-	-	-	-
Mallard	14	158	82	38	34 *	112	2	113	-2	196	29 *	121	16	253	13	168	-31 *	43
Tufted Duck	-	-	-	-	-	-	-	-	-	-	-	-	0	32	-	-	-	-
Red Grouse	-	-	-	-	3	52	-	-	-	-	-	-	-	-	-	-	-	-
Grey Partridge	-72 *	23	-	-	-61 *	30	-39	32	-55 *	43	-	-	-74 *	28	-	-	-	-
Pheasant	125 *	145	39	78	70 *	162	28 *	167	-10	287	97 *	147	30 *	421	60 *	306	-	-
Red-legged Partridge	-	-	-	-	20	57	-35 *	78	-12	184	73 *	37	146 *	134	197 *	66	-	-
Swift	-77 *	101	-78 *	33	-51 *	86	-55 *	81	-42 *	148	-66 *	71	-71 *	170	-70 *	146	-62 *	57
Cuckoo	-47 *	31	-	-	-66 *	44	-76 *	47	-66 *	101	-81 *	49	-76 *	156	-81 *	71	-	-
Feral Pigeon	-24	75	-	-	-40 *	65	-17	52	1	77	-27	43	12	117	-27	71	-14	75
Stock Dove	35	60	-	-	110 *	61	4	85	27	154	94 *	91	70 *	234	35 *	145	-	-
Woodpigeon	76 *	219	39 *	93	97 *	188	35 *	207	20 *	336	23 *	188	18 *	528	50 *	385	43 *	84
Turtle Dove	-	-	-	-	-	-	-	-	-97 *	52	-	-	-97 *	37	-	-	-	-
Collared Dove	-9	133	-36	36	-44 *	87	-19 *	114	18	211	-44 *	116	-21 *	310	-20 *	207	-27	52
Moorhen	-22	68	-	-	0	41	-34 *	61	-33 *	124	-16	60	-36 *	147	-34	73	-	-
Coot	-30	30	-	-	-	-	21	30	-18	39	57	30	-8	68	-	-	-	-
Oystercatcher	4	62	32	32	262 *	54	-	-	36	36	-	-	-	-	-	-	-	-
Lapwing	-27 *	114	-20	50	-7	113	-64 *	60	-42 *	72	-52 *	37	-69 *	97	-81 *	24	-	-
Curlew	-44 *	88	-27 *	53	8	118	-	-	-	-	-74 *	25	-	-	-	-	-	-
Snipe	-	-	-	-	60 *	40	-	-	-	-	-	-	-	-	-	-	-	-
(Cormorant)	-	-	-	-	-	-	-	-	-3	49	-	-	46	55	-14	35	-	-
(Grey Heron)	-38 *	77	-	-	51	38	-19	52	-35 *	83	12	57	-24	131	-31 *	88	-	-
Sparrowhawk	-52 *	32	-	-	-	-	-	-	-23	46	-	-	-38 *	66	-27	50	-	-
Red Kite	-	-	-	-	-	-	-	-	70,034*	33	-	-	19,094*	100	-	-	-	-
Buzzard	96 *	81	6,154*	34	3,342*	53	7,788 *	73	26,665*	93	163 *	106	1,140 *	207	-1	251	-	-
Gt Spotted Woodpecker	98 *	88	110 *	32	87 *	56	188 *	69	82 *	156	112 *	113	83 *	340	145 *	192	71 *	39
Green Woodpecker	-	-	-	-	-	-	186 *	53	52 *	173	21	65	-6	323	-8	142	1	31
Kestrel	-37 *	68	-	-	-14	64	6	67	-16	112	-44 *	40	-41 *	136	-50 *	78	-	-
Ring-necked Parakeet	-	-	-	-	-	-	-	-	-	-	-	-	579 *	39	-	-	26,266*	50
Jay	11	71	-	-	-	-	37	36	38 *	125	-22 *	64	-15 *	254	4	122	-27	40
Magpie	-18 *	185	-19	41	-17	110	22 *	159	38 *	255	-5	166	9 *	448	-11	318	41 *	82
Jackdaw	91 *	150	21	70	72 *	133	117 *	139	175 *	240	116 *	146	84 *	412	35 *	308	-	-
Rook	-21	88	-37	51	-25	118	8	105	12	184	14	88	-9	273	-17	238	-	-
Carrion Crow	27 *	227	-7	90	40 *	191	46 *	196	100 *	315	17	186	16 *	511	-1	381	63 *	83
Raven	-	-	-	-	-	-	-	-	-	-	136 *	33	-	-	-13	89	-	-
Coal Tit	63 *	74	17	46	49	50	6	42	-11	68	21	52	-6	167	10	115	-	-
Marsh Tit	-	-	-	-	-	-	-	-	-	-	-	-	-42 *	53	-11	31	-	-
Blue Tit	-17 *	205	-23 *	72	-6	164	26 *	192	28 *	315	-8	186	-5	513	-12 *	368	1	82
Great Tit	15 *	193	45 *	64	26 *	145	45 *	181	13 *	298	12	181	14 *	500	34 *	358	117 *	78
Skylark	-22	117	-23 *	77	-2	159	-2	167	-20 *	287	-12	119	-16 *	334	-31 *	238	-	-
Swallow	-53 *	193	-38 *	82	-46 *	167	-16	158	-29 *	228	-37 *	146	-26 *	334	-18 *	319	-	-
House Martin	-38 *	95	-44 *	31	-38	70	-47 *	60	-61 *	96	-60 *	79	-67 *	143	-60 *	155	-	-
Long-tailed Tit	23	88	-	-	19	57	51 *	87	4	161	-2	92	-28 *	265	28 *	167	11	34
Willow Warbler	-3	145	-28	75	-40 *	123	-44 *	95	-86 *	106	-57 *	89	-87 *	147	-67 *	152	-	-
Chiffchaff	421 *	114	391 *	53	401 *	95	492 *	120	172 *	229	198 *	151	63 *	415	35 *	327	161 *	35
Sedge Warbler	-	-	-	-	-	-	-	-	-24	45	-	-	-26	35	-13	34	-	-
Reed Warbler	-	-	-	-	-	-	-	-	11	42	-	-	-10	35	-	-	-	-
Blackcap	272 *	125	96 *	50	139 *	105	206 *	139	137 *	259	169 *	146	163 *	433	153 *	313	229 *	50
Garden Warbler	-47 *	29	-	-	-	-	-21	34	-30	60	-19	45	-40 *	101	-53 *	64	-	-
Lesser Whitethroat	-	-	-	-	-	-	-10	38	23	81	20	31	-23	60	-19	44	-	-
Whitethroat	-16	88	46 *	46	1	91	37 *	148	14	261	26 *	110	40 *	319	-8	226	-	-
Goldcrest	62 *	50	5	30	-	-	54	35	45 *	82	100 *	50	10	216	-30 *	144	-	-
Wren	54 *	217	5	86	28 *	190	43 *	198	31 *	311	30 *	183	10 *	505	4	377	28 *	78
Nuthatch	265 *	49	-	-	-	-	-	-	182 *	37	152 *	56	76 *	212	83 *	101	-	-
Treecreeper	-	-	-	-	-	-	-	-	-9	31	-	-	-14	101	-28	55	-	-
Starling	-65 *	172	-56 *	64	-64 *	128	-63 *	137	-38 *	231	-70 *	126	-65 *	345	-72 *	199	-69 *	80
Song Thrush	97 *	170	1	71	62 *	129	51 *	151	1	250	76 *	160	-4	458	12	324	-42 *	51
Mistle Thrush	-30 *	117	-20	42	-45 *	85	-41 *	84	-66 *	129	-34 *	87	-56 *	232	-51 *	133	-75 *	32
Blackbird	38 *	217	21	82	33 *	183	19 *	205	-3	328	18 *	188	-5	527	16 *	387	-56 *	84
Spotted Flycatcher	-	-	-	-	-	-	-	-	-87 *	17	-	-	-68 *	27	-68 *	28	-	-
Robin	46 *	209	18	78	52 *	163	42 *	193	37 *	309	47 *	186	16 *	511	13 *	373	85 *	81
Wheatear	-33	50	-	-	3	49	-	-	-	-	-	-	-	-	-	-	-	-
Tree Sparrow	33	31	-	-	110 *	45	8	32	-	-	-	-	-	-	-	-	-	-
House Sparrow	-8	160	-32	49	-10	108	-17	129	-25 *	198	-9	145	-27 *	325	10	258	-61 *	70
Duncock	14	181	15	66	-10	141	4	182	12	283	31 *	171	-4	456	6	343	5	63
Yellow Wagtail	-	-	-	-	-	-	-20	39	-39 *	49	-	-	-	-	-	-	-	-
Grey Wagtail	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-13	33	-	-
Pied Wagtail	-24 *	130	-14	53	-22 *	111	-17	101	-7	154	-3	88	-19 *	211	-25 *	161	-	-
Meadow Pipit	-18	89	-14	58	-2	108	-51 *	40	-68 *	40	-	-	-46 *	50	-17	50	-	-
Chaffinch	-32 *	215	-11	91	-10	188	-15 *	202	-45 *	324	-57 *	183	-52 *	504	-44 *	376	-42 *	55
Bullfinch	15	44	-	-	108 *	34	48 *	56	-59 *	64	-23	56	-47 *	141	-22	119	-	-
Greenfinch	-57 *	147	-68 *	44	-61 *	102	-59 *	138	-59 *	245	-58 *	136	-77 *	372	-70 *	269	-64 *	55
Linnet	-36 *	89	-35	52	-30 *	101	-25 *	124	-5	182	-25	77	-38 *	235	-29 *	195	-	-
Goldfinch	183 *	172	165 *	61	123 *	138	163 *	154	114 *	235	231 *	137	124 *	378	121 *	304	454 *	56
Corn Bunting	-	-	-	-	-	-	-	-	-28	39	-	-	-36 *	31	-	-	-	-
Yellowhammer	-62 *	51	-47 *	46	-17	94	-19 *	143	-21 *	224	-66 *	100	-42 *	255	-40 *	174	-	-
Reed Bunting	4	65	-	-	108 *	50	93 *	70	24	85	-	-	-44 *	63	23	36	-	-

Mammal monitoring and population trends

BBS mammal data are used to produce population trends for nine mammal species for the UK as a whole, countries and English regions, as well as being used in research.

Recording mammals is an optional part of BBS. Surveyors have the choice to record mammals during the BBS season, either on core visits, or during additional visits or via local knowledge. In 2022, mammal monitoring was conducted on 88% of BBS squares.

RECORDING

Forty-five species of mammals were recorded during 2022, either through visual counts or field signs. Red-necked Wallaby continues to be seen on a single square on the Isle of Man, first reported in 2017. Signs of European Beaver have been recorded on squares in Scotland since 2016. In October 2022, European Beaver was afforded additional protection under the Conservation of Habitats and Species Regulations. Might this mean that beaver signs become more widespread on BBS squares in the future?

BROWN HARE ON COURSE

In a previous BBS report (Harris *et al.* 2020) the long-term decline of **Brown Hare** in some regions was highlighted. Together with the knowledge that a second strain of Rabbit Haemorrhagic Disease Virus (RHDV2) had made the leap from **Rabbits** into hares across Eurasia, there was speculation that this would lead to more widespread decline of Brown Hare across the UK (Bell *et al.* 2019). However, following on from a 26% 2-year (short-term) increase in Brown Hare across the UK observed during 2019–21, this was maintained in the period 2021–22. This relatively short-term increase gives rise to a 27%

long-term (25 year) increase in the UK (Figure 18a) and 37% increase over the same period in England.

Mountain Hare, by contrast, has seen a decline of 40% in the last five years and 61% in the last 25 years in the UK (Figure 18b). The Mountain Hare Survey, a collaboration between NatureScot, GWCT, BTO and The Mammal Society, aims to better understand the abundance and distribution of this species in their stronghold in Scotland (Mammal Society, 2023).

RED FOX

Red Fox appeared to decline steeply during the period 2010–15, as highlighted in the 2018 BBS report, where a decline of 42% was reported in the UK between 1996 and 2017 and a 28% decline in the 10-year period (2007–17) over which the steepest declines were seen. These declines have continued, albeit less dramatically. The picture varies in the three English regions for which we have enough data to report trends (eastern, south-west and south-east England). Declines are evident in south-east and south-west England over 25- and 10-year periods. In the East of England, there is a non-significant 23% increase in the last five years (Figure 19).

Table 10: All mammal species recorded in 2022. 'Squares recorded' include counts of live mammals, field signs, dead mammals and local knowledge.

Species	Squares recorded
Red-necked Wallaby	1
Rabbit	1,583
Brown Hare	1,072
Mountain/Irish Hare	53
European Beaver	1
Grey Squirrel	1,157
Red Squirrel	30
Bank Vole	17
Water Vole	4
Field Vole	27
Wood Mouse	21
House Mouse	3
Harvest Mouse	2
Brown Rat	58
Hedgehog	33
Common Shrew	35
Pygmy Shrew	5
Water Shrew	1
Lesser White-toothed Shrew	1
Mole	495
Unidentified pipistrelle	2
Brown Long-eared Bat	1
Daubenton's Bat	1
Unidentified bat	2
Domestic Cat	318
Red Fox	414
Grey Seal	13
Common Seal	4
Badger	248
Pine Marten	19
Otter	21
Stoat	44
Weasel	13
Polecat	2
American Mink	4
Wild Boar	5
Reeves's Muntjac	279
Fallow Deer	141
Red Deer	156
Sika Deer	14
Chinese Water Deer	25
Roe Deer	919
Park Cattle	3
Feral Goat	9
Common Dolphin	1

FIND OUT MORE...

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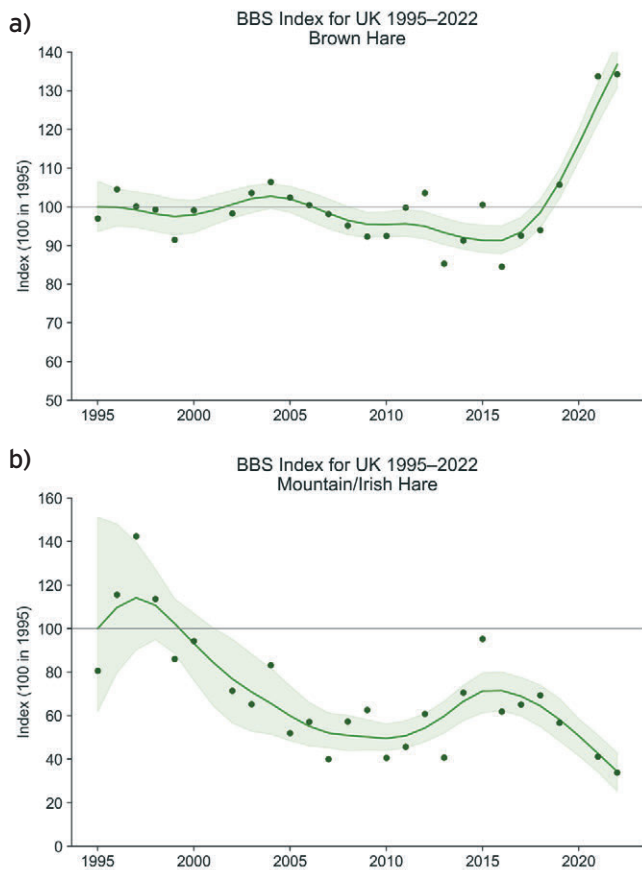


Figure 18: Contrasting UK trends in (a) Brown Hare and (b) Mountain/Irish Hare.

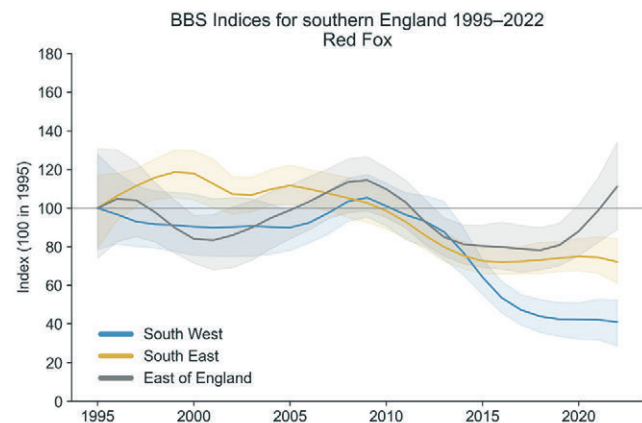


Figure 19: Red Fox declines are not uniform across England, with signs of a potential recovery in the East of England.

Table 16: Mammal trends in English regions.

Species	North West		North East		Yorkshire & Humber		East Midlands		East of England		West Midlands		South East		South West		London	
	96-21	Sample	96-21	Sample	96-21	Sample	96-21	Sample	96-21	Sample	96-21	Sample	96-21	Sample	96-21	Sample	96-21	Sample
Rabbit	-64 *	104	-66 *	42	-29	123	-69 *	113	-62 *	207	-70 *	110	-67 *	301	-38 *	190	-	-
Brown Hare	-8	62	75 *	33	52 *	81	71 *	97	48 *	152	-18	42	2	106	46 *	77	-	-
Grey Squirrel	100 *	61	-	-	7	38	92 *	51	26 *	108	7	78	17 *	225	40 *	118	43 *	52
Red Fox	-	-	-	-	-	-	-	-	-6	32	-	-	-30 *	65	-56 *	45	-	-
Reeves's Muntjac	-	-	-	-	-	-	-	-	250 *	56	-	-	168 *	38	-	-	-	-
Roe Deer	-	-	-	-	303 *	38	-	-	281 *	32	-	-	116 *	134	62 *	112	-	-

Table 11: Mammal trends in UK.

Species	Min. sample	1-year (21-22)	10-year (11-21)	25-year (96-21)	LCL	UCL
Rabbit	1,463	-5	-36 *	-67 *	-73	-59
Brown Hare	766	0	32 *	27 *	15	40
Mountain/Irish Hare	55	-18	-16	-61 *	-79	-32
Grey Squirrel	828	-33 *	31 *	30 *	16	41
Red Fox	266	-15	-36 *	-48 *	-55	-39
Reeves's Muntjac	121	-6	94 *	254 *	148	407
(Fallow Deer)	69	20	168 *	255 *	35	629
(Red Deer)	74	11	39	89 *	14	185
Roe Deer	496	-6	55 *	124 *	92	155

Table 12: Mammal trends in England.

Species	Min. sample	1-year (21-22)	10-year (11-21)	25-year (96-21)	LCL	UCL
Rabbit	1,202	-9	-42 *	-58 *	-65	-51
Brown Hare	651	-6	41 *	37 *	24	52
Grey Squirrel	740	-31 *	32 *	30 *	13	42
Red Fox	217	-15	-31 *	-46 *	-55	-38
Reeves's Muntjac	121	-6	93 *	251 *	154	437
(Fallow Deer)	65	10	143 *	251 *	98	444
Roe Deer	383	-16 *	63 *	150 *	110	215

Table 13: Mammal trends in Scotland.

Species	Min. sample	1-year (21-22)	10-year (11-21)	25-year (96-21)	LCL	UCL
Rabbit	112	2	-26	-85 *	-91	-74
Brown Hare	87	31 *	8	0	-24	42
(Red Deer)	53	20	13	35	-13	106
Roe Deer	113	8	47 *	101 *	56	172

Table 14: Mammal trends in Wales.

Species	Min. sample	1-year (21-22)	10-year (11-21)	25-year (96-21)	LCL	UCL
Rabbit	96	1	-46 *	-42 *	-60	-20
Grey Squirrel	61	-47 *	34	23	-12	58

Table 15: Mammal trends in Northern Ireland.

Species	Min. sample	1-year (21-22)	10-year (11-21)	25-year (96-21)	LCL	UCL
Rabbit	46	4	9	-35	-64	22
Mountain/Irish Hare	29	-62 *	1	-	-	-

NOTE: Trends are displayed in the same way as they are for the birds. Page 15 covers interpreting trends. 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 on a given BBS visit could influence the overall trend.

Breeding birds and badger culling

Does the Badger Cull in England have an impact on the population growth rates of breeding birds?

Charlotte Ward, Research Ecologist, BTO

The Breeding Bird Survey is an outstanding resource that provides us with data on the presence, persistence, absence and loss of breeding bird species in the UK countryside. It can be used to explore a wide range of important ecological questions, and can help to monitor possible effects of large-scale national policy decisions on breeding birds.

BADGERS AND BOVINE TUBERCULOSIS

Badgers are widespread in the UK, but in recent years have received increased attention for their potential to contract and transmit Bovine Tuberculosis (TB) to cattle herds. The Department for Environment and Rural Affairs (Defra) began licensed culling of Badger populations in 2013, in a bid to control and eradicate the spread of TB among livestock. Whilst the causative agent of TB, *Mycobacterium bovis* (*M. bovis*), can spread from Badgers to cattle, it is also possible for transmission to occur from cattle to Badgers. In addition, other species are susceptible to infection, including pigs, deer and goats. Therefore, eradication of the disease is a complex affair.

Cattle farming is a huge industry in the United Kingdom, with home-reared meat selling throughout the home nations and exported to countries Worldwide. Therefore, slaughtering tens of thousands of cattle due to infection by *M. bovis* each year has a dramatic impact, not only through loss of meat sales, but also by the costs of additional slaughter, and through costs associated with re-building a herd.

Over 175,000 individual Badgers have been removed from the English countryside since licensed culling began in 2013. It is important to assess ecological impacts of this depression of such a widespread predator from large areas of the country, for example, by evaluating effects on breeding birds. This is a controversial policy area, of course but, once it is happening, it is important that the best available evidence is used to evaluate it and that the evaluation is impartial.

NESTING BIRDS

Badgers forage predominantly on the ground and have a varied diet that includes earthworms, fruit, slugs, small mammals and birds. Bird species nesting on the ground,

or near to the ground, are therefore at greater risk of predation by Badgers than those that nest higher up, so comparing the fates of such species should indicate whether Badger removal is having an ecological effect. There is plentiful evidence of nest predation by Badgers, mostly involving eggs and nestlings, although the population effects of this predation are not yet clear. Nest predation probably (although not necessarily) means a reduction in the breeding success of individual birds, but effects at the species level are more uncertain, because reduced competition may allow surviving nest and young birds to do better, or predation by Badgers may just replace that by another predator.

WHAT WE DID

In conjunction with information on the presence of Badger culling, and the intensity of culls in given areas, BBS data allowed us to assess whether the removal of Badgers has an effect on breeding birds.

We examined the population growth rates (i.e. changes in numbers from year to year) between 2008 and 2019 of 14 ground-nesting birds and 41 non-ground-nesting bird species, both inside and outside of Badger culling areas. This period covered both the culling period and five years prior to the commencement of culling. The aim was to assess whether there were differences in species population growth rates between areas where Badger removal has taken place, and other areas nearby.

WHAT WE FOUND

We found that Badger removal was associated with growth rate changes for 18 of 55 bird species tested; 14 of these species had growth rates that were lower in Badger control areas. However, there was no tendency for these species to nest on the ground. There were, similarly, no clear patterns in respect of associations with the apparent intensity of culling. Therefore, there was no strong evidence of a causal relationship between bird species population growth rates and removal of Badgers for either ground-nesting or non-ground-nesting species; there was also little evidence to suggest community-level effects. Ground-nesting bird species can be predated by other species, and there is a possibility that populations of these other predators are themselves affected by Badger populations, so changes in predation pressure



Figure 20: Counties in England included in this study where licences to control Badgers have been granted as well as neighbouring counties where 2-km buffers around the treatment area extended beyond county boundaries (dark areas). Counties with cull licences granted from 2020 are shown in light shading, and counties in white have no culling activity during the period of study. Locations of BBS squares used in this study are shown by black dots. Note that the precise locations of cull areas are confidential. **Inset:** A badger investigating a tree stump, showing the vertical limit to its foraging niche.

after culling may be complex. However, it may also be that predation does not play a role in the population growth rates of breeding bird species, and instead, effects could be linked to land-management or food availability, for example. It is possible that any real effects of the Badger cull on the population growth rates of breeding birds will take longer to present themselves than the period of this study allowed.

NEXT STEPS

Our study demonstrated the utility of BBS data to explore the ecological impact of landscape-scale policy or management changes on breeding bird species. Additional years of BBS survey data and updated information on culling presence and intensity would support an improved future study assessing the effects on breeding birds of Badger culling, but this and other, similar studies would be more powerful if the management intervention could be applied in an experimental framework, such as alternating regions implementing it and retaining the status quo.

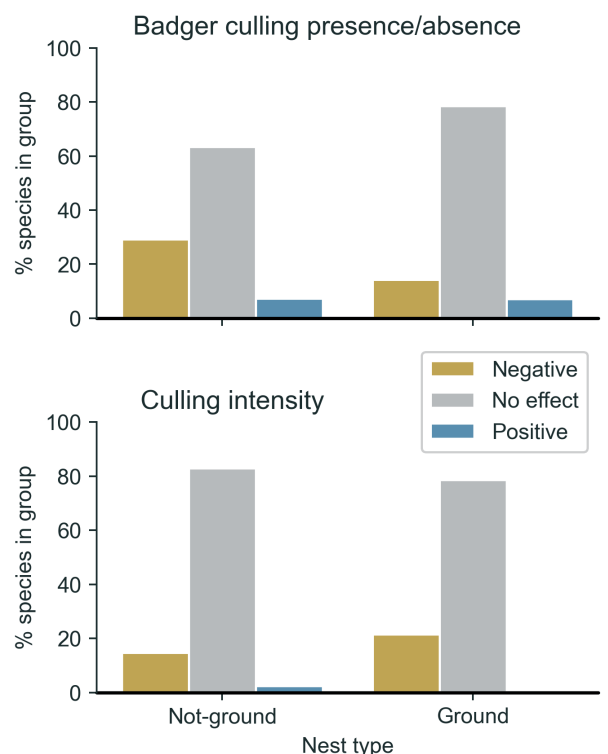


Figure 21: The percentage of species in each group where population growth rate was affected negatively, positively or not at all by either presence of Badger culling (top) or culling intensity (bottom). Species are differentiated on whether they are above ground- or ground-nesting.

FIND OUT MORE...

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Waterways Breeding Bird Survey: news and coverage

The Waterways Breeding Bird Survey forms part of the BTO/JNCC/RSPB Breeding Bird Survey partnership agreement and uses BBS-style transects along waterways – targeting the population monitoring of waterway specialists.

James Heywood, BBS (including WBBS) National Organiser, BTO

After returning to normal service in 2021, WBBS coverage continued to grow with an additional six stretches surveyed in England. There was also a joint equal record for coverage in Scotland, a repeat of the 62 stretches in 2021.

Table 17: The number of WBBS stretches with data received to date, with milestones underlined, and the total number of volunteers participating, by year.

	England	Scotland	Wales	Northern Ireland	UK total	No. of volunteers
1998	133	27	8	0	168	132
1999	133	36	14	3	186	170
2000	129	32	14	1	176	159
2001*	38	12	1	0	51	49
2002	151	49	26	2	<u>228</u>	203
2003	178	<u>53</u>	30	1	262	236
2004	191	59	37	0	287	258
2005	<u>210</u>	52	39	0	301	269
2006	202	57	32	<u>4</u>	295	257
2007	190	48	32	0	270	239
2008	200	48	27	1	276	241
2009	212	47	25	1	285	248
2010	204	43	23	1	271	238
2011	207	44	19	3	273	240
2012	204	57	21	3	285	244
2013	206	52	23	2	283	246
2014	203	53	26	2	284	248
2015	214	61	28	2	<u>305</u>	269
2016	215	57	30	2	304	266
2017	222	55	26	3	306	269
2018	219	49	24	2	294	261
2019	210	50	23	2	285	249
2020 [†]	125	20	3	3	151	134
2021	188	62	23	3	276	241
2022	194	62	20	3	279	248

*2001: foot-and-mouth disease, † 2020: COVID-19

2022 also saw a great deal of work by David White at BTO who digitised many of the historic WBBS route maps. If you are interested in adding WBBS to your repertoire of surveys, please do get in touch with us at wbbs@bto.org

WBBS 2022 IN FIGURES

In 2022, **Wren** was the most numerous species recorded, occurring on 96% of WBBS stretches.

Woodpigeon (94%), **Blackbird** (92%), **Robin** (91%) and **Mallard** (90%) were also in the top five species recorded.

Those species recorded on just one stretch included

Woodcock, Fulmar, Hen Harrier, Merlin, Firecrest and Woodlark.

The average number of bird species on a WBBS stretch was 37 and 31 species of mammal were recorded over the course of the survey in 2022. Thank you to everyone who took part in 2022.



▲ Map of WBBS stretches surveyed in 2022.

United Kingdom:

WBBS population trends

The WBBS continues to produce population trends for 28 species associated with waterways where the reporting threshold of being recorded on an average of 30 stretches or more since the survey began in 1998 is met. Of these, three species are only published online as they only reach the reporting threshold for five-year trends: Gadwall, Little Egret and Cetti's Warbler.

STATISTICALLY SIGNIFICANT RESULTS

Period	No. species	Greatest change in UK WBBS trends	
Long-term (99-20) increases	1	Greylag Goose	134%
Long-term (99-20) declines	11	Lapwing	-68%
Short-term (19-21) increases	1	(Cormorant)	32%
Short-term (19-21) declines	4	Mandarin Duck	-35%

The all-time, 10-year and one-year trends are displayed here and online. Further five-year trends are published online at: www.bto.org/wbbs-results. Of the 28 waterway specialists for which trends were possible, three species (reported in brackets) carry a caveat, explained on page 14.

Whereas **Mandarin Duck** and **Gadwall** have been recent additions to the list of species we can produce trends for, **Shelduck** sample sizes are steadily getting closer to the required number for reporting at both the five- and 10-year trend.

TUFTED DUCK DIVING

Of the 25 species listed in Table 18, only **Tufted Duck** shows significant declines across all one-, 10- and 22-year trends, highlighting a continued and steady decline since near the commencement of the WBBS in 1998 (Figure 22). Its predecessor survey, the Waterways Bird Survey (WBS) found Tufted Duck numbers approximately double between the 1970s and 1998. The more recent decline on the UK's waterways is in contrast to BBS data which indicated relative stability at the UK level across a wider range of habitats. However, even in BBS data, there is a more recent downward trend in England, where significant 19% and 24% declines have occurred over five- and 10-year periods respectively since a population peak

in around 2010. In this respect, the BBS population data in England and WBBS data are more in agreement.

A comparison of the population trends of waterbirds in Finland revealed that the population trend of Tufted Duck was significantly more positive in oligotrophic waterbodies (i.e. relatively nutrient poor) compared with eutrophic (nutrient enriched) waterbodies (Lehikoinen *et al.* 2016).

WBBS WORKSHOP

The trends of species like Tufted Duck highlight the considerable concern across the UK about the health of our waterways, including but not limited to the increasing number of reports of sewage discharges from storm overflows. WBBS and the data it collects is an important sentinel for the health of our waterways. In 2023, a workshop will be held to look at ways in which WBBS can improve its ability to best assess bird populations along our waterways.

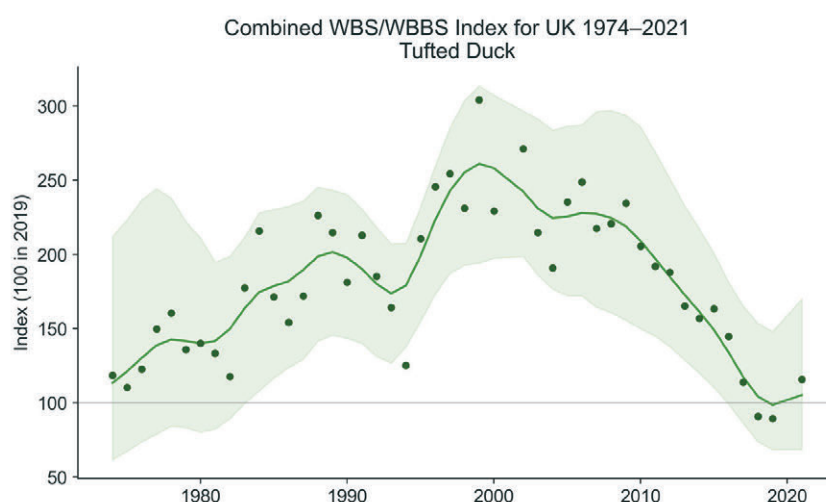


Figure 22: Tufted Duck population trends from the combined WBS/WBBS.

FIND OUT MORE...

Lehikoinen, A., Rintala, J., Lammi, E. & Pöysä, H. 2016 Habitat-specific population trajectories in boreal waterbirds: alarming trends and bioindicators for wetlands. *Animal Conservation* **19**: 88–95
<https://doi.org/10.1111/acv.12226>

Table 18: UK population trends during 2021-22, 2011-21 and 1999-2021.

Species	Min. sample	1-year (21-22)	10-year (11-21)	22-year (99-21)	LCL	UCL
Canada Goose	104	0	-19	77	-13	278
Greylag Goose	60	28	33	134 *	41	265
Mute Swan	114	-16	-8	-7	-33	24
Mandarin Duck	40	-35 *	77 *	-	-	-
Mallard	240	0	-16 *	-8	-20	6
Tufted Duck	42	-23 *	-52 *	-61 *	-77	-5
Goosander	57	-1	14	23	-14	74
Moorhen	149	11	1	-21 *	-34	-3
Coot	66	-5	-44 *	-45 *	-69	-18
Oystercatcher	80	-2	-25 *	-47 *	-57	-31
Lapwing	63	-6	-37 *	-68 *	-80	-49
Curlew	56	-9	-25 *	-65 *	-76	-52
Common Sandpiper	69	7	-19 *	-38 *	-48	-26

Species	Min. sample	1-year (21-22)	10-year (11-21)	22-year (99-21)	LCL	UCL
(Common Tern)	31	30	-47 *	-58 *	-73	-38
(Cormorant)	72	32 *	14	1	-24	31
(Grey Heron)	178	15	-5	-31 *	-39	-22
Kingfisher	72	56 *	-2	-16	-36	6
Sand Martin	77	-17 *	14	39	-20	123
Sedge Warbler	91	-4	-32 *	-53 *	-63	-38
Reed Warbler	59	1	-3	-11	-34	22
Whitethroat	132	-5	-27 *	-4	-20	16
Dipper	91	4	-11	-25	-43	1
Grey Wagtail	133	-1	28 *	-13	-30	9
Pied Wagtail	154	-12	-17 *	-44 *	-56	-32
Reed Bunting	114	-25 *	-17 *	-12	-26	5

INTERPRETING THE RESULTS: [see page 15](#)

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



▲ Tufted Duck is the only species which shows significant WBBS declines in the 22- 10- and one-year trends, highlighting a steady and continued decline across the UK’s waterways, following an increase dating back to at least the 1960s.

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 cover shows a complete list of the ROs who manage the Breeding Bird Survey locally; many of these ROs also co-ordinate the WBBS. For the list of those WBBS Regional Organisers who focus solely on managing WBBS (and are therefore not listed on the back page), please see the table opposite. If you would like to find out more about becoming a Regional Organiser and what is involved, please email: wbbs@bto.org

WBBS Regional Organisers in 2022:

ENGLAND

Huntingdon & Peterborough
Staffordshire (North, South, West)

VACANT
VACANT

NORTHERN IRELAND

Antrim & Belfast, Armagh, Down,
Londonderry and Tyrone

Michael Stinson

WALES

Montgomery

VACANT

We currently have vacancies for WBBS Regional Organisers in Aberdeen, Anglesey, Angus, Cambridgeshire, Carmarthen, Derbyshire (North & South), Devon, Essex (North-West & South), Huntingdon & Peterborough, Lancashire (North-West & South), Merseyside, Montgomery, Lincolnshire (South), Merseyside, Nottinghamshire, Orkney, Radnorshire, Staffordshire (North, South & West), Yorkshire (Leeds & Wakefield, North-West & Richmond).

In addition to the ROs, we offer our sincere thanks to all the volunteers and landowners who enable these surveys to take place and have continued impact.

SPECIAL THANKS: BBS REGIONAL ORGANISERS

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, but we would especially like to thank the ROs for their efforts.

BBS Regional Organisers in 2022:

ENGLAND

Avon Dave Stoddard
Bedfordshire Judith Knight
Berkshire Sean Murphy
Birmingham & West Midlands Steve Davies
Buckinghamshire Phil Tizzard
Cambridgeshire **VACANT**
Cheshire (Mid) Paul Miller
Cheshire (North-East and South) Hugh Pulsford
Cleveland Michael Leakey
Cornwall Michael Williams
Cumbria Colin Gay
Derbyshire (North, South) **VACANT** (now Simon Roddis)
Devon **VACANT**
Dorset Jack Winsper
Durham David Sowerbutts
Essex (North-East) Rod Bleach
Essex (North-West) Graham Smith (now **VACANT**)
Essex (South) **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 Bob Knight
Lancashire (East) Bernard Bracken
Lancashire (North-West) Jean Roberts (now **VACANT**)
Lancashire (South) **VACANT**
Leicestershire & Rutland Dave Wright
Lincolnshire (East) Phil Espin
Lincolnshire (North) Chris Gunn
Lincolnshire (South) Jo Hubbard (now **VACANT**)
Lincolnshire (West) Mike Daly
London (North) Sabrina Schalz
London (South) Richard Arnold
Manchester Nick Hilton
Merseyside **VACANT**
Norfolk (North-East) Chris Hudson
Norfolk (North-West) Jonathan Martin
Norfolk (South-East) Rachel Warren
Norfolk (South-West) Vince Matthews
Northamptonshire Barrie Galpin
Northumberland Muriel Cadwallender
Nottinghamshire **VACANT**
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 Annette Jarratt-Knock
Wiltshire (North, South) Polly Marino
Worcestershire Steve Davies
Yorkshire (Bradford) Mike Denton
Yorkshire (Central) Mike Brown
Yorkshire (East, Hull) Brian Walker
Yorkshire (Leeds & Wakefield) **VACANT**
Yorkshire (North-East) Nicholas Gibbons
Yorkshire (North-West) **VACANT**
Yorkshire (Richmond) Mike Gibson (now **VACANT**)
Yorkshire (South-East, South-West) Grant Bigg
Yorkshire (York) Rob Chapman

SCOTLAND

Aberdeen Moray Souter (now **VACANT**)
Angus **VACANT**
Argyll (Mull, Coll, Tiree & Morven) Ewan Miles
Argyll (mainland & Gigha) & Bute Nigel Scriven
Arran James Cassels
Ayrshire Dave McGarvie
Benbecula & The Uists Yvonne Benting
Borders Neil Stratton
Caithness Donald Omand
Central Neil Bielby
Dumfries Andy Riches
Fife & Kinross Paul Blackburn
Inverness (East & Speyside, West) Hugh Insley
Islay, Jura & Colonsay David Wood
Kincardine & Deeside Claire Marsden

Kirkcudbright
Lanark, Renfrew & Dunbarton
Lewis & Harris
Lothian
Moray & Nairn
Orkney
Perthshire
Rhum, Eigg, Canna & Muck
Ross-shire
Shetland
Skye
Sutherland
Wigtown

Andrew Bielinski
Gordon Brady
Craig Ferries
Stephen Metcalfe
Melvin Morrison
Colin Corse (now **VACANT**)
Mike Bell
Bob Swann
Simon Cohen
Dave Okill
Carol Hawley
Bob Swann
Andrew Bielinski

WALES

Anglesey
Brecknock
Caernarfon
Cardigan
Carmarthen
Clwyd (East)
Clwyd (West)
Glamorgan (Mid, South)
Glamorgan (West)
Gwent
Merioneth
Montgomery
Pembrokeshire
Radnorshire

Ian Hawkins
Andrew King
Rhion Pritchard
Naomi Davis
VACANT
Anne Brenchley
Mel ab Owain
Wayne Morris
Lyndon Jeffery
Richard Clarke
Dave Anning
VACANT (now Margaret Town)
Annie Haycock
Carlton Parry (now **VACANT**)

NORTHERN IRELAND

Antrim & Belfast
Armagh
Down
Fermanagh
Londonderry
Tyrone

Kevin Mawhinney
Stephen Hewitt
Alastair McIlwain
Michael Stinson
John Clarke
Steven Fyffe

CHANNEL ISLANDS

Channel Islands (excl. Jersey)
Jersey

Chris Mourant
Tony Paintin

ISLE OF MAN

Isle of Man 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: Jim Baldwin, John Clarke, Colin Corse, Glynne Evans, Mike Gibson, Jo Hubbard, Carlton Parry, Jean Roberts, Moray Souter and Jack Winsper. Sadly, Graham Smith passed away in 2022 and we are grateful for all his assistance in Essex North-West.

We would like to thank and welcome George Batho, Pete Cadogan, Claire Hassan, Simon Roddis, Teresa Tearle and Margaret Town 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 and WBBS transects on their land.



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