



The Breeding Bird Survey 2021 *incorporating the Waterways Breeding Bird Survey*

Population trends of the UK's breeding birds



THE 2021 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 2021 were James Pearce-Higgins (Chair, BTO), Dawn Balmer (BTO), Mark Eaton (RSPB), Simon Gillings (BTO), Leah Kelly (RSPB), David Noble (BTO), Simon Wotton (RSPB) and Paul Woodcock (JNCC).

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THE BBS TEAM AT BTO

Sarah Harris is the BBS National Organiser and first point of contact for BBS or WBBS queries. Sarah is responsible for the day-to-day running of these surveys, liaising with BTO Regional Organisers and volunteers, maintaining the databases, promoting the schemes, and producing the annual report. David White, who joined the team in March 2022, is now supporting Sarah, part-time, with the volunteer coordination of these surveys. Welcome to the team, David!

Dario Massimino, Research Ecologist in the Bioacoustics and Data Science Team, produced the bird and mammal population trends for 2021. 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 Sarah 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 BirdTrends website at www.bto.org/birdtrends

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



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 2021: Ollie Barrett, Matthew Baxter, Gill Birtles, Neil Calbrade, Ben Darvill, Mark Hammond, Stephen Hewitt, Kelvin Jones, Andrew Joys, Steve Pritchard, Anna Robinson, William Skellorn, 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, 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 McLean, Mike Meharg, Richard Minter, Ian Mitchell, David Morris, Dorian Moss, Stuart Newson, Nancy Ockendon, Will Peach, Ken Perry, Mike Raven, Brenda Read, Warren Read, Angela Rickard, Kate Risely, Ken Smith, Sandra Sparkes, David Stroud, Pierre Tellier, Chris Thaxter, Richard Thewlis, Derek Thomas, Mike Toms, Lawrence Way, Richard Weyl, Andy Wilson (BBS and WBBS logos), Karen Wright and Lucy Wright.

We acknowledge the support of the Northern Ireland Environment Agency, who fund professional fieldworkers to cover 52 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.

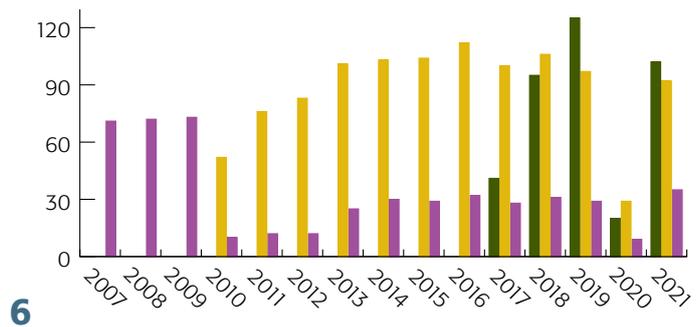
Report production was by Sarah Harris. The cover photo of an Oystercatcher was kindly supplied by Ben Andrew/RSPB images and the report was printed by Swallowtail Print, Norwich, using carbon-balanced paper from responsible sources.



INSIDE...

This is the twenty-seventh 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 1994–2021 and 1998–2021 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 118 species now reported using BBS data and 28 waterway specialists using WBBS data. The results are used widely to set priorities and to inform conservation action.

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CITATION

Harris, S.J., Massimino, D., Balmer, D.E., Kelly, L., Noble, D.G., Pearce-Higgins, J.W., Woodcock, P., Wotton, S. & Gillings, S. 2022. *The Breeding Bird Survey 2021*. BTO Research Report 745. British Trust for Ornithology, Thetford.

Published by the British Trust for Ornithology, the Joint Nature Conservation Committee and the Royal Society for the Protection of Birds, June 2022.

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BTO Research Report 745

ISSN 1368-9932

ISBN 978-1-912642-37-3



The latest news from the Breeding Bird Survey

After the difficulties of the 2020 survey season, due to COVID-19 restrictions, personal considerations and safety, it's been fantastic to see a strong return in BBS coverage in 2021.

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

The Breeding Bird Survey (BBS) has bounced-back from the understandable low coverage of 2020, when COVID-19 impacted many of our lives. Thankfully, the BBS evidently has a very strong supporter-base who ensured, either by coordination of, or by carrying out the surveys, that 2021 saw the UK coverage reach 3,919 squares with new record coverage totals seen in Scotland, Northern Ireland and the Isle of Man!

VOLUNTEERS

In 2021, 2,685 volunteers took part in the BBS and 238 volunteers surveyed their Waterways Breeding Bird Survey (WBBS) stretches. In this report, we meet two such volunteers, find out what their personal highlights have been, and hear why they take part each year. BBS volunteers also revisited 275 BBS squares to carry out the Wider Countryside Butterfly Survey (WCBS) later in the day and season than the standard bird surveys. It would be fantastic to increase participation in the WCBS on BBS squares and it is easy to register interest in the 'Details and Settings' section of the BBS Online system.

WADING THROUGH RESULTS

This report focuses on two main outputs from the BBS and WBBS: the latest assessments of the Birds of Conservation Concern (BoCC5) and the plight of many breeding waders in the UK. We look at positive conservation options, found either by using survey data or as a result of research carried out on species flagged

as 'in trouble' by the BBS and WBBS trends and BoCC5 assessments. Of course it is not all bad news, and with increases in coverage and/or because the distribution of a given species has expanded, new trends were possible for some species in some countries or regions as their sample size increased and reached the reporting threshold.

Recent publications are on page 29 of the report and demonstrate the power of BBS data beyond the population trends. The results from BBS mammal recording and the WBBS are covered, in full, later in the report.

CONSISTENCY

The trend calculations for these surveys compare the maximum count of adult birds from the Early and Late Visits, per species, from one year to the next. It is important to only count adult birds so that these comparisons are consistent. In addition, it is important to maintain a consistent route and to seek advice if a route change is absolutely necessary. Thank you.

BBS ONLINE: *data downloads, preferences, mentoring and more ...*

The BBS Online system continues to go from strength to strength, all whilst maintaining the basic familiarity and functions known to the many Regional Organisers and volunteers using the system.

It is possible to see **average survey dates** for allocated squares, to **set preferences** – from what **forms volunteers receive**, **how the data entry pages display** through to willingness to take part in **mentoring** or the **Wider Countryside Butterfly Survey**.

Download functions allow users to select from a list of download options, enabling exploration of data via Excel sheets and the downloading summaries on pdf documents to share with landowners.

The idea is that all the information needed by Regional Organisers and volunteers is available within the system. Thanks are due to the BTO Information Systems team for developing and maintaining BBS Online.

BBS Online **written guidance and video tutorials** are available at www.bto.org/bbs-online and, of course, **we welcome paper returns** – and any unentered historical data, even back to the survey's start year of 1994!



Wider Countryside Butterfly Survey

BBS squares can be revisited later in the season in order to walk the same routes (later in the day) to monitor butterflies. This contributes to the Wider Countryside Butterfly Survey (WCBS) alongside Butterfly Conservation's (BC) own survey sites.

PEAKING AND PIONEERING

Surveying for the WCBS on BBS and BC squares peaked on the 24th August 2021, with 94 visits conducted. One BBS square in Great Shelford, Cambridgeshire, received 14 visits, making it the most surveyed square in 2021, contributing to the 1,807 WCBS visits made across the survey season. Of the 787 squares visited, 79% were surveyed with the required two visits, and an average of 63 butterflies were recorded per visit. Of the 787 WCBS squares covered, 35% were BBS squares.

Meadow Brown was the most widespread species in 2021 and, despite its population decline, Small Tortoiseshell saw one of the largest increases in occupancy compared to 2020, whilst Holly Blue saw the greatest occupancy drop.

Data were received from 11 BBS squares and one BC square for which no previous butterfly data are available, and WCBS-specific data were submitted from 75 squares for the first time.

To see the latest butterfly population trends, into which WCBS data feed, visit www.ukbms.org/latest-results.

Figure 1 WCBS coverage and sightings for the 2021 season, including data from both Butterfly Conservation and BBS squares.

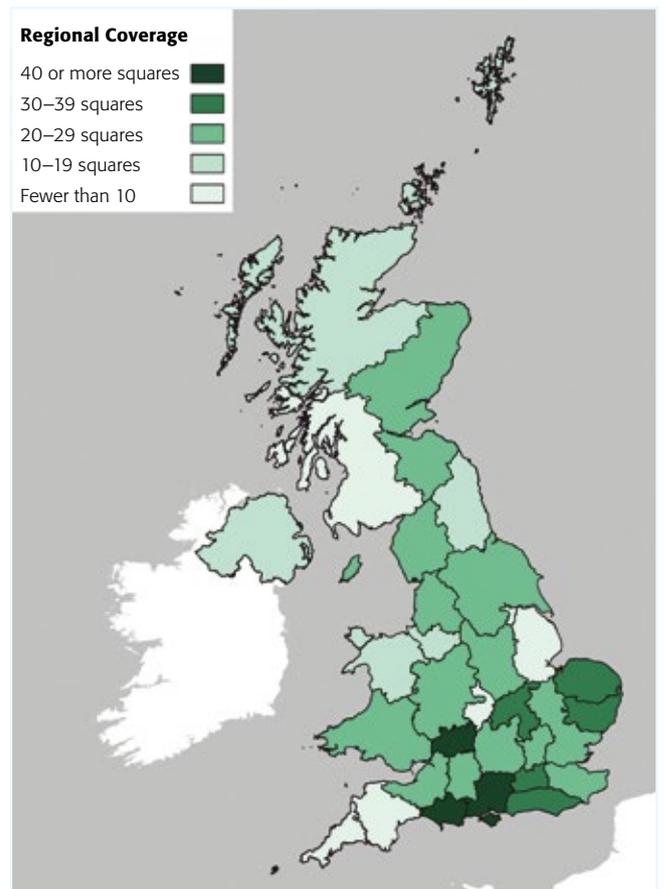
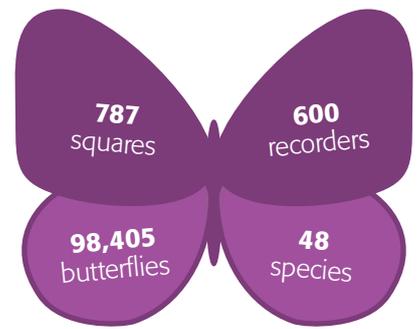


Figure 2 WCBS coverage of Butterfly Conservation (BC) and BBS squares in BC Branch areas in 2021.

Your Tweets

Tweet us at [@BBS_birds!](https://twitter.com/BBS_birds)

MAP DATA FROM OPENSTREETMAP: OPENSTREETMAP.ORG
TWEETS: WWW.TWITTER.COM

Stephen Dunstan @StephenDunstan2

This year's second visit to the [@BBS_birds](https://twitter.com/BBS_birds) square with added eccentricity included 13 Starlings on the water park facade.

Mark Thackstone @MarkThackstone

Sometimes you luck out- not necessarily with the birds but with the weather. Pretty sure last time I was here it was a whiteout! [@BBS_birds](https://twitter.com/BBS_birds) upland ranger, late visit.

Kate Fox @birdingfox

Did my first ever [@BBS_birds](https://twitter.com/BBS_birds) survey for [@BTO_GLOS](https://twitter.com/BTO_GLOS) yesterday! 🍀🍀 21 species recorded, highlights included Goldcrest, Treecreeper and Great-spotted Woodpecker. My transect takes me through some pretty stunning Bluebell woods 😊 [@BTO](https://twitter.com/BTO) #CitizenScience

Sightings and coverage in 2021

Once more, the total coverage of BBS squares across the UK is back up to tickling the 4,000 mark! A fantastic achievement following on from the difficulties faced during the ongoing COVID-19 pandemic, impacting most harshly for BBS in the 2020 season.

Thanks are due to the 2,685 surveyors who covered squares in all corners of the UK, along with the endless enthusiasm of the BTO Regional Organisers who helped to ensure the survey bounced back.

SPOTTED IN 2021

Everyone's hard work and support paid off, with 233 bird species recorded. From rarities, such as Sabine's Gull, Golden Oriole, Rose-coloured Starling, Blyth's Reed Warbler and Lapland Bunting, through to the commonest species, including Woodpigeon, Jackdaw, Rook and Blackbird, kept surveyors busy counting! To those dedicated BBS Report readers, invested now in the Red-tailed Hawk living wild in the South Downs National Park, the species was recorded there again in 2021, for the 13th year! This record contributes to the survey's non-native recording, alongside species such as Canada Goose, Indian Peafowl and Ring-necked Parakeet.

On average, 29 species were seen on each BBS square but 189 squares contained fewer than 10 species, with three squares containing one species; two with Meadow Pipit and one with a single Golden Plover. At the opposite end of the scale, the highest species count was 76 on a square near the Cotswold Water Park. Seventy-five squares had 50 or more species recorded. As ever, wherever a square sits on the diversity scale, they are all equally important to survey.

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

	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	2,892	<u>3,308</u>
<i>No. of volunteers</i>	<i>838</i>	<i><u>1,013</u></i>	<i>1,197</i>	<i>1,523</i>	<i>1,830</i>	<i>1,917</i>	<i>1,858</i>	<i>542</i>	<i>1,778</i>	<i>1,871</i>	<i><u>2,022</u></i>	<i>2,332</i>	<i>2,660</i>

NEW RECORDS

Scotland, Northern Ireland and the Isle of Man all saw record coverage in 2021 and upland areas are becoming increasingly well represented with Upland Adjacent add-on options and the Upland Rovers coverage option for BBS squares, introduced in 2010 and 2017 respectively. Scottish Woodland (SWBBS) squares were once surveyed by professional fieldworkers and now form part of the BBS square set covered by volunteer surveyors.

Coverage for Colony Recording remains stable, with 444 squares (11%) containing colony counts, and Detection Type – whether a bird is first detected by call, song or visually – was recorded on 3,111 squares (79%); this now well bedded in since its introduction in 2014, with the hope of helping to better calculate periodic population estimates.

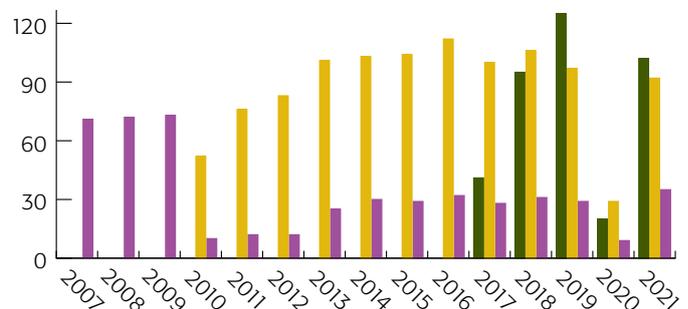


Figure 3 Scottish Woodland, Upland Adjacent and Upland Rovers coverage contributing to the overall coverage for BBS. Y-axis = number of squares.

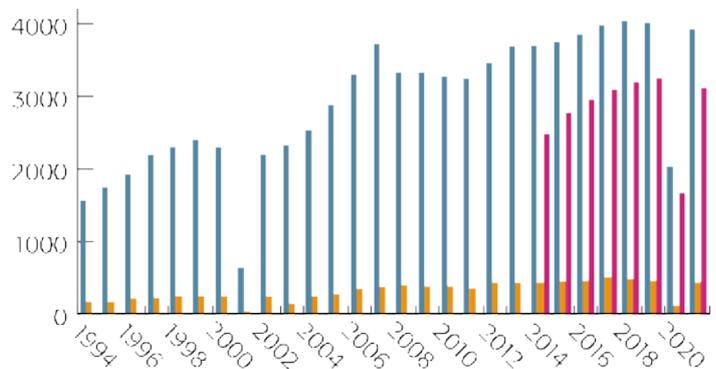


Figure 4 Total BBS coverage, Colony Recording and Detection Type coverage by square (y-axis).

INTERVIEW YOU

Here, we introduce you to 15 year old Oscar Puls who currently surveys a BBS and a WBBS site in Ross-shire. Below, we focus on Oscar's BBS volunteering:

1. What has been your best visit to the site and what is your favourite record to date?

My favourite visit to the site was probably one last year when I had Whitethroat, Tree Sparrow, Grey Wagtail and Osprey in the span of about 25 minutes. It was a warm sunny day as well, making it even more enjoyable.

2. What would you most like to find on your survey?

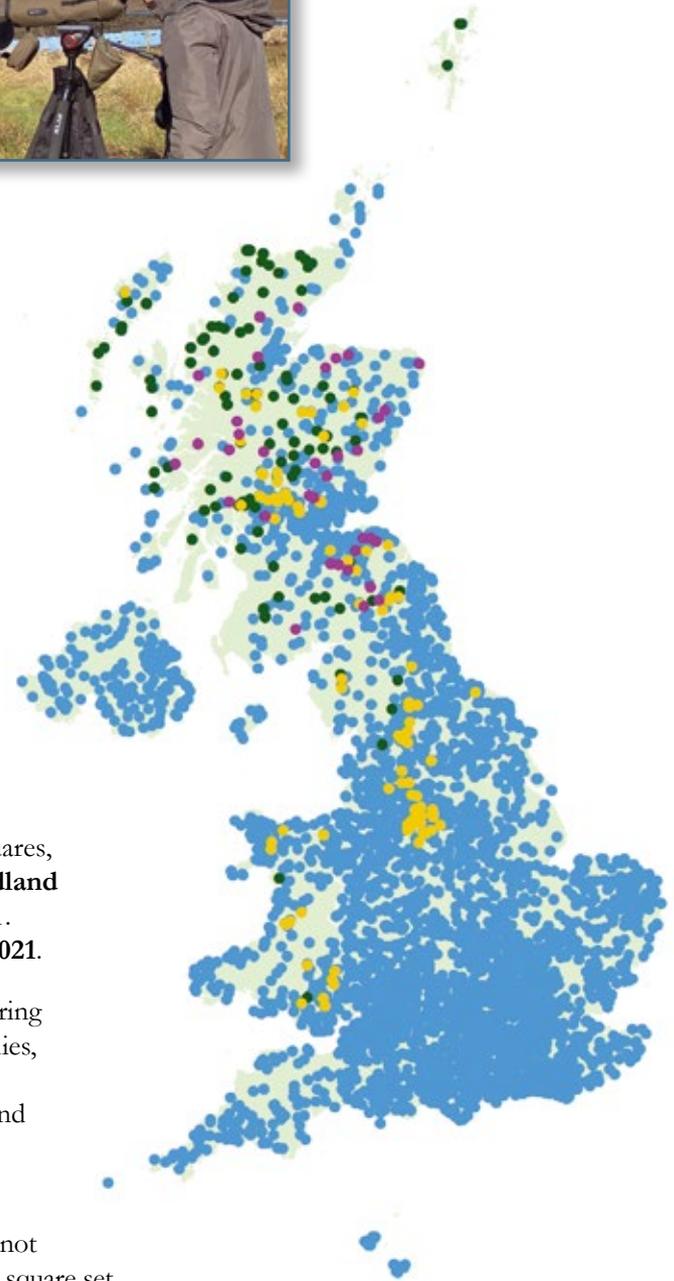
I'd love to find breeding evidence of a bird not often known to breed in the area, such as Red-legged Partridge. Of course, it would also be great to find a rarity like a rare warbler or something.

3. And finally, what made you want to take part?

I enjoy getting out to go birding and the fact that I would be helping with the recording of species made the idea of doing the survey even more interesting. I've enjoyed the survey very much and look forward to doing it again for a third year.



www.bto.org/bbs-volunteers



COVERAGE OVERVIEW

This coverage map illustrates where the **3,690 'core'** ■ BBS squares, **92 'add-on'** ■ Upland Adjacent squares, **35** ■ Scottish Woodland squares and **102** ■ Upland Rovers squares were located in 2021. Combined, these make up the **3,919 BBS squares covered in 2021**.

This impressive coverage resulted in 14,544 km being walked during active surveying. That is the equivalent of walking, as the crow flies, from JNCC offices in Aberdeen to Perth, Australia! This figure would be a lot higher when taking into account the walks in to and from squares and between transects.

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 52 squares in Northern Ireland is included in the map and table. Please see pages 15 and 28 for more information on these surveys and square types.

OSCAR PULS: JODI PULS

2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020**	2021
2,822	2,556	2,569	2,566	2,538	2,671	2,729	2,734	2,832	2,875	2,948	2,990	2,935	1,761	2,815
486	404	396	331	358	383	471	482	476	490	523	581	608	156	625
269	242	235	246	223	275	332	340	343	334	340	332	325	58	298
129	121	116	115	110	117	127	120	78	127	131	119	119	28	152
16	15	17	16	15	21	26	27	23	24	28	20	21	17	19
4	1	-	-	-	4	-	-	3	2	3	4	8	9	10
3,726	3,339	3,333	3,274	3,244	3,471	3,685	3,703	3,755	3,852	3,973	4,046	4,016	2,029	3,919
2,958	2,638	2,569	2,552	2,489	2,627	2,774	2,734	2,793	2,797	2,835	2,833	2,773	1,444	2,685

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

In the Red ... Amber and Green: the birds and butterflies

Data collected using various schemes and surveys across the UK have allowed for an updated assessment of the status of the UK's birds and butterflies. Data collected during the BBS, WBBS and WCBS have made an important contribution!

By **Dawn Balmer**, Head of Surveys, **David Noble**, Head and Principal Ecologist, and **Sarah Harris**, BBS National Organiser, BTO

Every six years the population status of all birds with regular breeding and/or wintering populations in the UK is compiled by a coalition of the UK's leading bird conservation and monitoring organisations.

ASSESSMENTS AND STATUS

A set of objective criteria and the latest available information, including trends from the Breeding Bird Survey, Waterways Breeding Bird Survey, Wetland Bird Survey and the Heronries Census, are used for the status assessments. The criteria include trends in population and range, population size, localisation and international importance of each species as well as their global and European threat status. First published 25 years ago, the result of this is a regularly updated Red List for species of highest conservation concern, an Amber List of species of moderate level of conservation concern and a Green List of species which are faring better. The fifth iteration, Birds of Conservation Concern (BoCC5), was published in December 2021 in *British Birds*.

IN THE RED

There are now 70 species on the Red List, 103 on the Amber List, and 72 on the Green List. By contrast, the very first Red List, published in 1996, included only 36 species. The latest Red List shows a net gain of three since 2015; 11 species have been added (see Box 1) but six others have moved to Amber, and two (Golden Oriole and Aquatic Warbler) have been excluded altogether, as no longer regularly breeding in the UK.

However, the news is not all bad. White-tailed Eagle moves from Red to Green due to increases in numbers, a consequence of protection and reintroductions, and Song Thrush, Pied Flycatcher and Redwing move from Red to Amber due to a lessening of breeding population declines. Five new species to be assessed by BoCC5 were added to the Amber List: Little Bittern, Cattle Egret, Great White Egret and Black-winged Stilt, which now breed regularly in the UK's wetland habitats but remain scarce and Yellow-browed Warbler was also added to the Amber List as an increasingly regular wintering visitor.

Box 1 Eleven species were added to the Red List. W = based on winter trends.

Bewick's Swan (W) from Amber	Purple Sandpiper from Amber
Goldeneye (W) from Amber	Leach's Storm-petrel from Amber
Smew (W) from Amber	Montagu's Harrier from Amber
Ptarmigan from Green	House Martin from Amber
Swift from Amber	Greenfinch from Green
Dunlin (W) from Amber	

Four species join the Red List due to sharp declines in their wintering populations revealed by the BTO/RSPB/JNCC Wetland Bird Survey: Bewick's Swan, Smew, Goldeneye and Dunlin. Interpreting the conservation significance of changes in wintering populations can be complex because many northern-breeding wildfowl and wader species no longer travel as far south or west in winter, a phenomenon called short-stopping, and hence numbers in the UK may be smaller.

IMPORTANT DATA SOURCES

Long-term surveys are important data sources in this assessment, with Breeding Bird Survey UK trends providing the main source of information for 25 species, including Red Grouse, Swift, Wood Warbler, Grasshopper Warbler, Stonechat and Siskin. By combining long-term trends from the Common Birds Census and Waterways Breeding Bird Survey (predecessors to BBS and WBBS respectively) with the Breeding Bird Survey and Waterways Breeding Bird Survey, it is possible to use robust joint trends to assess longer term breeding population changes for more than 50 species since the 1970s.

In the UK, we are fortunate to have a wealth of detailed information, thanks to the dedicated efforts of thousands of volunteer birdwatchers contributing to bird-monitoring schemes. The Common Birds Census, which started in 1962, enables us to capture severe historical declines. We have a very accurate but alarming picture of the fortunes of our bird populations and the evidence on which to direct conservation action. In six years' time, let's hope that our monitoring results reveal further successes.



▲ In the latest Birds of Conservation Concern, Greenfinch moved from the Green List (lowest concern) onto the Red List (highest concern) due to population declines.

It's not just UK bird species which are assessed for their level of extinction risk, so too are butterflies. May 2022 saw the publication of the revised Red List of British butterflies.

WCBS–BBS CONTRIBUTIONS

Data from the UK Butterfly Monitoring Scheme (UKBMS) and criteria from the International Union for Conservation of Nature (IUCN) were used to assess the population status and range of butterflies in Britain. BBS volunteers have the option to take part in the Wider Countryside Butterfly Survey on their BBS squares – walking the same transects used for the bird surveys but later in the season and the day to count butterflies, (plus day-flying moths and Odonata). These data feed into the UKBMS and, in turn, provide information to help inform this assessment.

RESULTS

The status categories are slightly different to those used in the BoCC5 assessments but are as follows: four species categorised as Regionally Extinct; eight as Endangered; 16 as Vulnerable; five as Near Threatened; 29 ranked as Least Concern and one species was deemed not applicable for classification (the Long-tailed Blue – an erratic UK visitor from the Mediterranean).

The last assessment was published in 2010 but used data up until 2004, therefore some changes in status were to be expected. The most striking changes were in the Vulnerable and Near Threatened categories, with several species switching to Vulnerable (now 16, up from nine) from Near Threatened (now five, down from 11).

WHY ASSESS STATUS?

As with the bird assessments, this status update highlights the rapid changes in butterfly populations over the past



▲ Dinky Skipper (top left) moved from Vulnerable to Least Concern due to both abundance and distribution change no longer meeting the 'threatened' criteria in recent years. The species is widely but locally distributed in England, Scotland and Wales. In contrast, due to distribution declines recorded in Wall (bottom) populations and declining abundance in Scotch Argus (top right), both species moved two places along the 'status scale' with Wall moving from Near Threatened to Endangered and Scotch Argus from Least Concern to Vulnerable.

decade, with 28 species now threatened/Red-listed (which includes: Regionally Extinct, Endangered and Vulnerable), an increase from 23 in the last assessment. The number of species ranked as 'Least Concern' remained almost unchanged with an increase from 28 to 29. Although this Red List is not the same as conservation priorities, such assessments are often the catalyst for conservation action.

BBS VOLUNTEER ACTION

All BBS volunteers can sign up to revisit their BBS square/s for the Wider Countryside Butterfly Survey and contribute data to research work and monitoring such as this. Visit www.bto.org/butterflies to find out more. Many thanks to those already taking part in the Wider Countryside Butterfly Survey on BBS squares.

FIND OUT MORE...

Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D. & Win, I. 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.

Fox, R. & Dennis, E.B. 2022. A revised Red List of British Butterflies. *Insect Conservation and Diversity* (<https://butterfly-conservation.org/news-and-blog/new-red-list-of-british-butterflies>).

Waders and woodland: Informing a conservation conflict

A case study of how BBS data have been used to produce a tool to help minimise conflict between two very pressing conservation needs: wader declines and climate change.

By **John Calladine**, Senior Research Ecologist, BTO

Declining numbers of breeding waders are well documented in BBS reports and elsewhere. Waders have become high profile conservation priorities, with some suggesting even that Curlew could be the most pressing bird conservation priority in the UK. Even more people argue that anthropogenic climate change could be the most pressing environmental conservation priority in the world. An important strategy for ameliorating climate change is to plant more trees. However, while planting more trees may be a nature-based solution it can have other impacts, as most breeding waders require open landscapes which can be encroached upon by tree planting schemes. Everyone who has taken part in the BBS or *Bird Atlas 2007–11* has helped produce a tool that aims to minimise this conflict between these different conservation objectives.

SENSITIVITY MAPS

Forest expansion and the creation of new woodlands are either actively underway or planned across many parts of the UK. For example, the Scottish Forestry Strategy sets out ambitious goals for woodland expansion, aiming for a 2.5% increase in forest cover by 2032, to be achieved by increasing annual targets for new woodland to 150 km² by 2025. Such initiatives will deliver many environmental and conservation benefits, such as climate change mitigation, habitat restoration, flood-risk management and opportunities for woodland and shrubland birds, including many that are conservation priorities themselves. However, forest expansion could adversely impact breeding waders, highlighting the need for it to be part of an informed, joined-up, land use strategy.

The intensification of agriculture has been less frequently practical or commercially worthwhile in the more harsh upland environments; as a result the uplands and their margins have become a refuge for many formerly widespread species, including breeding waders. However, it is this less productive agricultural land that is often favoured for new woodlands and plantations and so the problem for waders can become acute. To deliver the benefits of reforestation, while minimising adverse impacts on breeding waders, will require accessible information on the latter's distribution. This would allow woodland expansion to be targeted away from key wader areas. So, with the support of Scottish Forestry, Forestry Commission England, the Cairngorms National Park Authority (CNPA) and Working for Waders, among a long list of other interested stakeholders, BTO has used *Bird*

Atlas 2007–11 and other environmental datasets to model the relative abundance of breeding waders. This has produced maps of the predicted abundance for 10 species of breeding wader at 1-km resolution across Britain.

ASSESSING THE MAPS

Modelled and predicted outputs need checking, especially if they are going to be used to make important management decisions. If looking for an extensive and independent dataset that covers a full range of breeding wader densities, then the BBS is ideal. Using BBS data demonstrated that the predictive models were most successful for Curlew and Oystercatcher and least for Ringed Plover and Greenshank. Poor model performance was, not unexpectedly, associated with species that have a restricted distribution and/or occupy restricted habitats. Not only does such an assessment allow the patterns of abundance matched between the modelled indices derived from *Bird Atlas* data and the empirical BBS data to be checked, it also allows a calibration of those indices to determine the range of densities of birds found within each of the predicted abundance strata – something that stakeholders needed to help them better interpret the model outputs. Furthermore, it will allow us to periodically sense check the outputs in future. We have checked the models against both contemporary data with the *Bird Atlas 2007–11* and a more recent period (2016–19).

Going forwards, we will be able to periodically repeat and update such calibration and checking. That is until we have a whole new atlas dataset to use but that will not be until the 2030s.

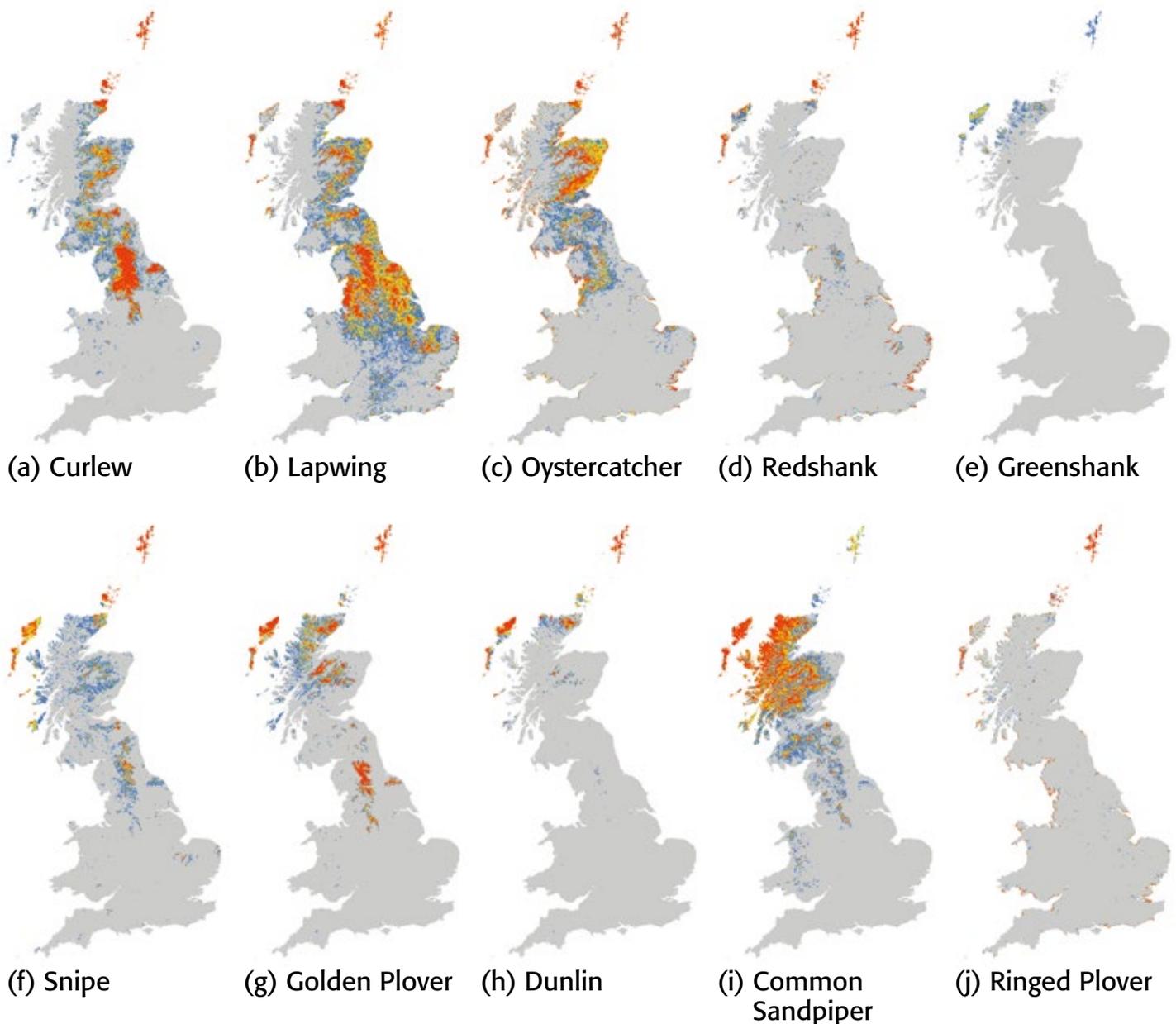


Figure 5 The mapped predicted abundances of breeding waders in Britain plotted at 1-km resolution. The highest relative abundances are represented by red, then in declining abundances by orange, yellow, blue and grey.

MAKING AN IMPACT

At the time of writing, work is ongoing to make the wader sensitivity maps publicly available, including on Forestry Commission England's external browser and the BTO website. To facilitate practical interpretation by stakeholders influencing the conservation of breeding waders, the outputs are categorised into five discrete strata of relative abundance. The broad patterns and distribution of these strata will be used to inform high-level policy decisions affecting breeding waders. At a more local scale, they will be used to infer levels of scrutiny required to assess specific developments. How the maps are used will require a flexible approach to account for regional differences in importance and priorities, which in turn are likely to change with time. However, when considering lowland or enclosed

farmland, the model predictions for Curlew and Lapwing potentially supplemented with those for Oystercatcher and Redshank, likely best represent relative importance for breeding waders. For more upland and unenclosed areas the predictions for Curlew and Golden Plover potentially provide the best information.

FIND OUT MORE...

O'Connell, P., Wilson, M., Wetherhill, A. & Calladine, J. 2021. *Sensitivity mapping for breeding waders in Britain: towards producing zonal maps to guide wader conservation, forest expansion and other land-use changes. Report with specific data for Northumberland and north-east Cumbria.* BTO Research Report 740. BTO, Thetford.

Land sharing, land sparing, or a bit of both?

How can we produce the food needed by society whilst also ensuring healthy populations of different bird species? BBS data were used to test how different landscape scenarios benefited bird species.

By **Tom Finch**, Senior Conservation Scientist, RSPB

The Breeding Bird Survey isn't just about monitoring past changes in populations of breeding birds; we can also use BBS data to predict future changes, for example under different scenarios of agriculture and land use. A collaboration between RSPB, BTO and the University of Cambridge did just this.

WHERE DO WE START?

Globally, the expansion and intensification of agriculture are leading drivers of biodiversity loss. Understanding how to meet the nutritional needs of the human population at least cost to nature is a critical – and often contested – question.

First, a thought experiment: imagine you've been tasked with managing a large-ish area of land, with only one requirement: you need to produce a particular amount of food. Whether this 'production target' is high or low, you have a decision to make: do you focus on tackling agricultural intensification (through lower yields, but meaning that more of your land needs to be farmed

to meet the target) or agricultural expansion (through higher yields, coupled with the protection or restoration of some unfarmed habitat)? In a perfect world we might prefer to tackle both simultaneously – but for a given production target, the more we do of one, the less we can do of the other.

This thought experiment is known as the 'land sharing-sparing model', which provides a framework for evaluating the biodiversity consequences of contrasting scenarios, each producing the same overall quantity of food – see Figure 6a. Evidence has been collected under this framework from several regions of the world, and for a variety of taxa. This body of work suggests that more

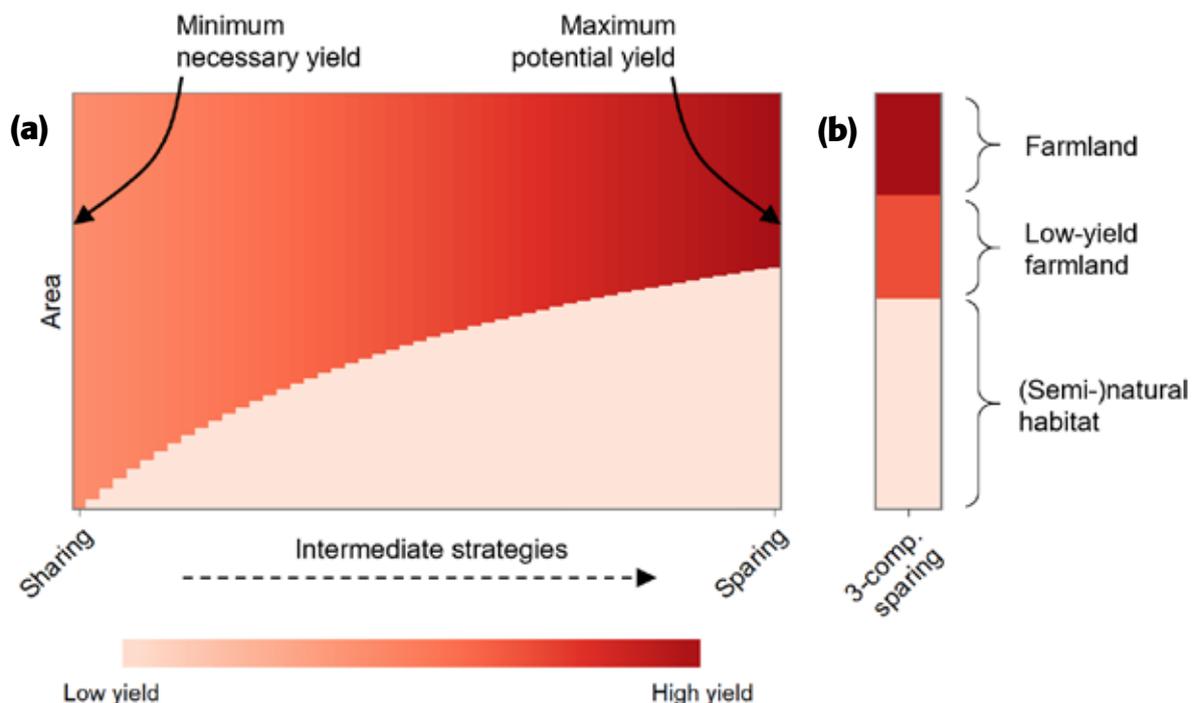


Figure 6 Illustration of different strategies for meeting a fixed regional food production target. In (a), each vertical slice represents a distinct strategy, from extreme land sharing on the far left, to extreme land sparing on the far right, through a continuum of intermediate strategies. (b) Shows a mixed, or 'three-compartment' approach, which combines elements of both sharing and sparing.



Species such as Willow Warbler are expected to achieve larger populations under land sparing – which maximises the area of semi-natural woody habitat – than land sharing.

Species such as Yellowhammer are expected to achieve larger populations under land sharing – which maximises the area of lower-yielding farmland – than land sparing.



species would benefit from a land sparing approach (in which the extent of farmland is minimised through high-yield farming, thus sparing more semi-natural habitat) than from land sharing.

WHAT DID WE DO?

Our aim was to apply this framework to lowland England. The foundation of the project is the ‘density-yield’ curve, which describes the relationship between the yield of a site and the density of each species. Using BBS data, we fit density-yield curves for 101 species in the East Anglian Fens and 83 in Salisbury Plain and the surrounding farmland. Densities were derived from the counts made by volunteer surveyors, and yields were estimated for each BBS square using satellite derived crop maps and agricultural statistics. We then used the density-yield curves to predict the population size of each species across the sharing-sparing continuum.

WHAT DID WE FIND?

Compared to previous studies, our conclusions were less clearly in favour of a land sparing approach, particularly in Salisbury Plain where many species preferred an intermediate strategy. Even in The Fens, where the majority of species did best under land sparing, a substantial minority preferred a different strategy. In short, we found a conflict between sharing-preferring farmland species on the one hand, and sparing-preferring natural habitat specialists on the other. Any shift towards one end or the other of the sharing-sparing continuum is bad for one of these groups.

An alternative approach involves combining both sharing and sparing within the same scenario. This involves three compartments of land – see Figure 6b: some unfarmed land providing habitat for sparing-preferring

species; some low-yield farmland providing habitat for sharing-preferring species; and some high-yield farming which takes the pressure off the more wildlife-friendly components of the landscape. We found strong support for this ‘three-compartment sparing’ strategy in both regions, and have also found that this approach is compatible with improving other environmental outcomes, for example reducing greenhouse emissions or improving water quality.

WHAT DOES IT MEAN?

Our research suggests that a three-compartment approach can effectively reconcile the conflict between food production and conservation whilst delivering additional environmental benefits.

The three-compartment approach was recently highlighted in the National Food Strategy and the JNCC’s Nature Positive report, and has parallels with the three-tier Environmental Land Management (ELM) Scheme currently being developed in England.

Key questions remain, such as how much land should be devoted to spared semi-natural habitat versus low-yield farming, and which habitats and high-nature farming systems should be promoted where. Perhaps more importantly, understanding which farming practices and systems ensure long-term sustainability of high-yield farmland is critical.

FIND OUT MORE...

Balmford, A. 2021. Concentrating vs. spreading our footprint: how to meet humanity’s needs at least cost to nature. *Journal of Zoology* **315**: 79–109.

Finch, T., Gillings, S., Green, R.E., Massimino, D., Peach, W.J. & Balmford, A. 2019. Bird conservation and the land sharing-sparing continuum in farmland-dominated landscapes of lowland England. *Conservation Biology* **33**: 1045–1055.

Finch, T., Green, R.E., Massimino, D., Peach, W.J. & Balmford, A. 2020. Optimising nature conservation outcomes for a given region-wide level of food production. *Journal of Applied Ecology* **57**: 985–994.

Finch, T., Day, B.H., Massimino, D., Redhead, J.W., Field, R.H., Balmford, A., Green, R.E. & Peach, W.J. 2020. Evaluating spatially explicit sharing-sparing scenarios for multiple environmental outcomes. *Journal of Applied Ecology* **58**: 655–666.

Feniuk, C., Balmford, A. & Green, R.G. 2019. Land sparing to make space for species dependent on natural habitats and high nature value farmland. *Proceedings of the Royal Society B: Biological Sciences* **286**: 20191483.

National Food Strategy. 2021. (www.nationalfoodstrategy.org).

JNCC. 2021. *Nature Positive 2030*. (www.jncc.gov.uk/our-role/the-uk/nature-positive-2030).

Breeding wader surveys



Both BBS and WBBS volunteers helped to test the feasibility of using the additional visits to BBS and WBBS sites to uncover landscape patterns of wader productivity.

By **Paul Noyes**, Wader Project Officer, BTO

We are faced with a problem when it comes to wader monitoring: waders are relatively long-lived birds, so there is an unhelpful lag (for researchers) between impacts on their breeding grounds and adult abundance detected on surveys.

Breeding success, or productivity, is the key information needed to assess new threats, or immediate impacts of habitat management, to best inform conservation strategy. However, traditional methods of measuring productivity are time-consuming and specific-skill-dependent, with a greater risk of disturbance, limiting them to specific projects or studies. So what can be done?

THE SOLUTION

BTO, with support from the BBS Steering Group, called upon the brilliant network of skilled BBS/WBBS volunteers to trial an emerging survey method using waders' characteristic chick-defence behaviours late in the season to generate crude indices of productivity, to examine productivity at a landscape scale. Volunteers with breeding waders on their BBS/WBBS sites were asked to complete at least one additional 'Breeding Wader' visit mid-June to mid-July, recording the waders they encountered, as well as their behaviour and the presence of any young (the collection of such detailed information is not part of the core BBS/WBBS visits).

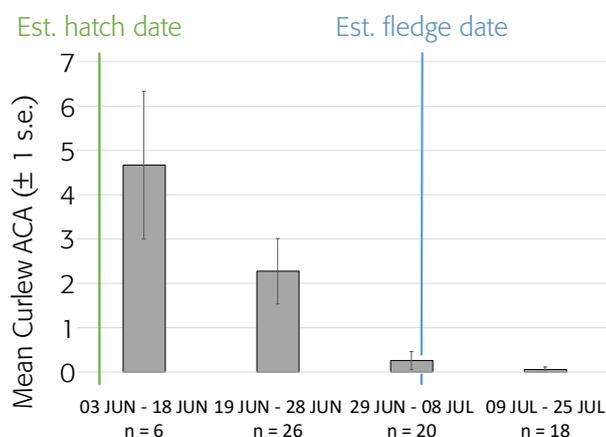


Figure 7 Mean Curlew apparently chick-rearing adults (ACA) recorded on each participating BBS square where Curlew were recorded (n = 70 squares) across the period the Breeding Wader visits took place in 2021. Estimated hatch and fledge dates derived from ringing and Nest Record Scheme data.

RESPONSE AND RESULTS

The response was fantastic! Data were received from 98 BBS squares and 14 WBBS stretches. On participating BBS squares, the most commonly recorded species were Curlew, Lapwing and Oystercatcher; on WBBS stretches, they were Common Sandpiper, Oystercatcher and Curlew.

For Curlew, the visits were within expected chick-rearing dates (based on Ringing and Nest Record Scheme data) and we found expected patterns in adult chick-defence behaviour across the breeding season – see Figure 7. Lapwing are earlier breeders (the requested mid-June to July visits were too late to assess productivity), and observed patterns also matched what we would expect. Initial findings also suggest that Curlew productivity was positively related to gamekeeping effort in the surrounding upland landscape. All these findings indicate our volunteers' wader productivity data were sensitive to real patterns on the ground.

FUTURE STEPS

In 2022, we'd like to build upon the success of 2021 and increase participation even further by providing improved guidance on identifying wader chick-defence behaviours along with when to visit. The data from the first year of this trial survey suggest that simple information on breeding wader behaviour collected by skilled BBS and WBBS volunteers could provide us with critical insights into patterns of variation in wader productivity. This approach could also be applied to other kinds of wader surveys, enabling valuable productivity information to be gathered across a much wider range of circumstances than would otherwise be possible.

HOW TO TAKE PART

BBS and WBBS volunteers who record breeding waders on their first or second visits are asked to consider completing an additional third Breeding Wader (BW) visit to their relevant survey sites. Relevant sites are those with key breeding species: Curlew, Golden Plover, Lapwing and Oystercatcher. During this additional visit, volunteers are tasked with collecting valuable information about the number and behaviour of the waders they encounter, as well as presence of young. Please visit the webpages below for more information on how to participate.

On BBS squares: www.bto.org/bbs-waders

On WBBS stretches: www.bto.org/wbbs-waders

Interpreting BBS and WBBS results

The pages which follow (pages 16–27 and pages 30–31) 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. For the most part, the table and graph layouts are the same: some guidance on reading these tables and graphs is provided here, with other relevant tips on interpreting the information displayed.

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 two-year change for 2019–21 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’ (25-year) trend, a two-year change is presented. Normally, this is a one-year change (i.e. 2020 to 2021) but due to COVID-19 restrictions, data were too limited for this. The long-term change up to 2020 can be presented as this is part of a longer smoothed trend and does not suffer from the same problem of lacking data in 2020.

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.

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

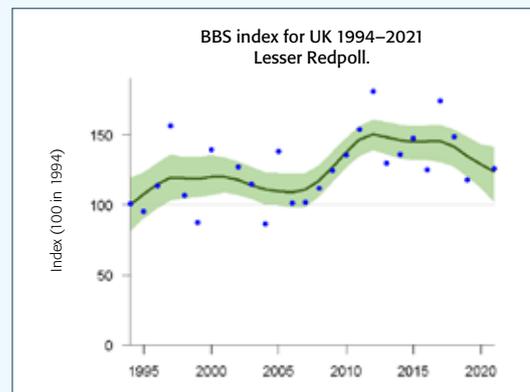
WBBS RESULTS ONLINE: www.bto.org/wbbs-results

INTERPRETING GRAPHS

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

BBS and WBBS index graphs show:

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



TRENDS AND TABLES EXPLAINED

Species	Min. sample	2-year (19–21)	10-year (10–20)	25-year (95–20)	LCL	UCL
Stonechat	181	-3	56 *	147 *	86	237
Wheatear	371	29 *	-35 *	-32 *	-43	-17

- Trends for species in brackets are reported with caveats (explanation on pages 28, 31 and 34).
- For bird trends, **Red-listed** and **Amber-listed** species from ‘Birds of Conservation Concern 5’ are shown in the relevant colour.
- The ‘Min. sample’ 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 is the smaller of the sample sizes for the 10- and 25-year trends, per species, per region.
- Trends are presented as the percentage change over three periods: two-year, 10-year and 25-year.
- The short-term change covers the most recent years of the survey, i.e. for BBS and WBBS: 2019 to 2021.
- The long-term changes for both BBS and WBBS, cover the lifetime of the survey (BBS birds: 1994–2021, BBS mammals: 1995–2021, WBBS: 1998–2021). The 10-year trends cover 2010–20 for both surveys. All-time (25-year) 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: 1995–2020, BBS mammal trend: 1996–2020 and WBBS bird trend 1999–2020.

United Kingdom: population trends



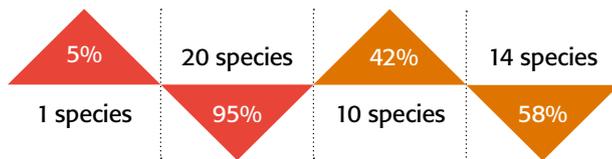
Once again, we were able to produce trends for bird species which reached the reporting threshold (recorded on 40 or more BBS squares, on average, during the time period the trend covers). Trend periods include 25-year (all-time), 10-year and five-year trends, the latter are published online at www.bto.org/bbs-tables. In addition, two-year changes (2019 to 2021) are displayed for all species with longer-term trends. For more information on these trend tables, please see page 15.

STATISTICALLY SIGNIFICANT RESULTS

Period	No. species	Greatest change in UK trends	
Long-term (95–20) increases	39	(Little Egret):	2,380%
Long-term (95–20) declines	43	Turtle Dove:	-96%
Short-term (19–21) increases	13	Cetti's Warbler:	60%
Short-term (19–21) declines	27	Willow Tit:	-61%

Species listed in brackets are reported with a caveat. See page 28.

▼ Statistically significant **long-term** (1995–2020) change by BoCC5 assessment classification; Red or Amber.



▼ Statistically significant **short-term** (2019–2021) change by BoCC5 assessment classification; Red or Amber.

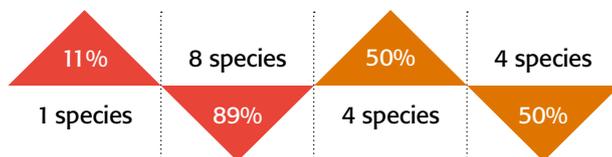


Figure 8 Number of species within each Birds of Conservation Concern 5 category (more on page 8): Red or Amber, which have undergone a statistically significant increase or decline over the long- (1995–2020) and short-term (2019–21). Green (least concern) and unclassified species (e.g. non-native species) are not included here.



practices and delaying grassland mowing regimes can help boost breeding productivity locally. A mosaic of habitats within reach of the nesting birds and their young can help for species such as **Lapwing**, and predator control to help **Lapwing** and **Curlew** especially, can also aid species locally.

For **Common Sandpiper**, some studies suggest human disturbance as a potential negative impact and reduced adult survival, although the cause of the latter is unclear.

UK TRENDS ANOMALIES

Trends have been calculated for 118 species. The sample sizes for **Turtle Dove** and **Wood Warbler** are below the threshold for the five-year trend but because the trend has been shown in the past, it is included in the online trend table.

Egyptian Goose, **Mandarin Duck**, **Cetti's Warbler** and **Nightingale** reached the reporting threshold for England, which is slightly lower than the UK threshold, and are therefore published here, whereas **Pied Flycatcher** does not reach the 10-year trend historically, or in any other country or region and therefore, just the all-time and five-year trends are displayed here and online. **Firecrest** reaches the five-year reporting threshold for England, and therefore

the five-year trend is included online for this species at a UK-scale too. **Willow Tit** historically reached the 10-year threshold for England and is reported here.

MAIN NEWS

Waders stand out as being in trouble, with long-term trends showing statistically significant decreases for five species and the figures are either close to the 25% or 50% decline mark. These are **Oystercatcher** and **Common Sandpiper** around the 25% mark, and **Lapwing**, **Curlew**, and **Redshank** near the 50% mark.

For many of these wader species, land management measures such as sensitive woodland and forestry planning, water level control, the creation or restoration of wet areas, implementation of beneficial grazing

HAPPIER NEWS

Little Egret has been colonising the UK, starting in the south and working their way north, first breeding in Devon in 1996, two years after the BBS started. Since then, the survey has recorded a 2,380% increase!

Another bird recolonising areas is **Red Kite**. The species is doing well, increasing by 1,935% between 1995 and 2020, after being reintroduced to England, Scotland and Northern Ireland. Coincidentally, the non-native **Ring-necked Parakeet** has also increased by 1,935% over the same time period, spreading out from substantial but localised sites. This is a species native to Africa and southern Asia and has bred annually wild in the UK since 1969.

Table 2 UK population trends during 2019–21, 2010–20 and 1995–2020.

Species	Min. sample	2-year (19–21)	10-year (10–20)	25-year (95–20)	LCL	UCL
Canada Goose	562	12	15	106 *	60	166
Greylag Goose	292	4	3	180 *	27	539
Mute Swan	277	0	17	41 *	9	103
Egyptian Goose	32	-3	23	1,198 *	355	>10,000
Shelduck	158	10	-16	0	-49	64
Mandarin Duck	38	52 *	96 *	621 *	261	1,637
Gadwall	50	-21	102 *	234 *	87	626
Mallard	1,441	4	-5	12 *	3	24
Teal	47	-6	59 *	-	-	-
Tufted Duck	166	-13	-15	14	-21	61
Goosander	46	6	-12	-25	-55	48
Red Grouse	156	-19 *	4	4	-16	31
Grey Partridge	206	10	-23 *	-62 *	-68	-56
Pheasant	2,043	6 *	6 *	40 *	30	51
Indian Peafowl	46	-19	-44 *	-	-	-
Red-legged Partridge	610	16 *	9	31 *	15	46
Swift	1,044	-2	-39 *	-60 *	-65	-54
Cuckoo	665	5	29 *	-34 *	-42	-24
Feral Pigeon	737	9	-4	-18 *	-29	-6
Stock Dove	925	15 *	41 *	38 *	21	55
Woodpigeon	2,775	4 *	-5 *	33 *	26	40
Turtle Dove	40	-44 *	-82 *	-96 *	-98	-95
Collared Dove	1,459	-12 *	-27 *	-12 *	-18	-4
Moorhen	671	-5	-21 *	-20 *	-28	-11
Coot	287	-19 *	-24 *	-2	-24	20
Little Grebe	75	-12	10	19	-12	67
Great Crested Grebe	76	-4	-8	-1	-34	31
Oystercatcher	383	4	-7	-22 *	-33	-9
Lapwing	685	-8	-24 *	-48 *	-54	-40
Golden Plover	68	-4	0	-9	-29	25
Curlew	533	-5	-9 *	-48 *	-54	-41
Snipe	181	17	-2	21	-2	45
Common Sandpiper	76	-11	-13	-28 *	-42	-8
Redshank	88	-13	-14	-49 *	-66	-19
(Common Tern)	68	1	54	21	-40	110
(Cormorant)	269	14	1	26	-8	75
(Grey Heron)	695	-4	-12 *	-14 *	-25	-1
(Little Egret)	62	-12	69 *	2,380 *	800	>10,000
Sparrowhawk	355	-8	-21 *	-25 *	-34	-14
Marsh Harrier	48	-34 *	14	-	-	-
Red Kite	212	14	159 *	1,935 *	1,093	3,804
Buzzard	1,244	-3	11 *	95 *	78	114
(Barn Owl)	53	32	-28 *	228 *	134	435
Little Owl	73	18	-42 *	-67 *	-75	-58
(Tawny Owl)	97	-13	-8	-32 *	-48	-15
Kingfisher	57	-32 *	0	-22	-51	19
Gt Spotted Woodpecker	1,243	8 *	-2	139 *	123	159
Green Woodpecker	880	6	-23 *	8 *	0	18
Kestrel	684	7	-21 *	-40 *	-46	-33
Hobby	46	3	-20	-13	-40	28
Peregrine	54	8	-23	-46 *	-62	-13
Ring-necked Parakeet	96	15	101 *	1,935 *	813	>10,000
Jay	872	1	6	24 *	14	36
Magpie	2,096	1	0	-2	-7	4
Jackdaw	1,986	-6	16 *	65 *	48	80
Rook	1,427	0	-5	-20 *	-29	-12
Carrion Crow	2,639	3	1	17 *	8	26
Hooded Crow	147	-14	0	3	-23	29
Raven	386	-14	20	43	-3	111
Coal Tit	935	-16 *	-11 *	4	-8	19
Marsh Tit	150	-30 *	-29 *	-46 *	-58	-34
Willow Tit	31	-61 *	35 *	-86 *	-91	-79
Blue Tit	2,570	-8 *	-6 *	1	-3	5
Great Tit	2,455	-14 *	-10 *	32 *	25	38
Skylark	1,887	3	3	-15 *	-20	-10
Sand Martin	147	3	-2	26	-43	130
Swallow	2,149	-15 *	-44 *	-23 *	-29	-18
House Martin	977	-37 *	-34 *	-37 *	-44	-29
Cetti's Warbler	37	60 *	187 *	626 *	248	8,102
Long-tailed Tit	1,089	-22 *	-9 *	14 *	3	25
Wood Warbler	47	-41 *	-39 *	-76 *	-86	-65
Willow Warbler	1,457	-1	-10 *	-10 *	-17	-2
Chiffchaff	1,808	18 *	23 *	118 *	108	135
Sedge Warbler	316	-6	-29 *	-19 *	-34	0
Reed Warbler	144	8	0	29 *	5	60
Grasshopper Warbler	88	39	-27 *	-1	-31	44
Blackcap	1,891	-9 *	47 *	194 *	174	215
Garden Warbler	466	-23 *	-22 *	-29 *	-40	-18
Lesser Whitethroat	304	-26 *	4	4	-10	19
Whitethroat	1517	-9 *	-11 *	20 *	11	31
Goldcrest	895	-16 *	0	-6	-21	12
Wren	2,730	-5 *	20 *	22 *	17	27
Nuthatch	608	-9 *	19 *	113 *	87	139
Treecreeper	397	-10	-2	-1	-14	17
Starling	1,828	-6	-11 *	-53 *	-56	-49
Song Thrush	2,240	11 *	13 *	27 *	21	34
Mistle Thrush	1210	7	-6	-30 *	-35	-23
Blackbird	2,748	0	-3 *	20 *	16	24
Ring Ouzel	45	23	36	-	-	-
Spotted Flycatcher	167	-32 *	-26 *	-63 *	-70	-54
Robin	2,644	13 *	8 *	22 *	18	27
Nightingale	33	6	0	-48 *	-71	-7
Pied Flycatcher	40	-18	-	-53 *	-74	-27
Redstart	194	1	-15 *	0	-17	19
Whinchat	78	5	-2	-57 *	-67	-44
Stonechat	181	-3	56 *	147 *	86	237
Wheatear	371	29 *	-35 *	-32 *	-43	-17
Dipper	67	0	-6	-39 *	-60	-11
Tree Sparrow	206	-19	1	100 *	52	172
House Sparrow	1770	-6 *	4 *	0	-8	6
Dunnock	2,301	3	-7 *	14 *	9	20
Yellow Wagtail	169	4	28 *	-36 *	-49	-20
Grey Wagtail	237	-11	3	-7	-23	11
Pied Wagtail	1,367	-1	-8 *	-19 *	-26	-13
Meadow Pipit	874	3	8 *	-14 *	-21	-6
Tree Pipit	153	-5	-9	-13	-30	14
Chaffinch	2,740	-8 *	-34 *	-26 *	-29	-22
Bullfinch	700	-12 *	2	2	-7	13
Greenfinch	1,789	-1	-65 *	-68 *	-70	-65
Linnet	1,309	16 *	4	-20 *	-27	-12
Lesser Redpoll	184	7	-6	20	-12	61
Crossbill	62	-28	-52 *	-19	-50	20
Goldfinch	1,958	-6 *	32 *	156 *	138	171
Siskin	221	28 *	-16 *	33 *	7	69
Corn Bunting	149	29	36 *	-16	-41	6
Yellowhammer	1,255	2	-13 *	-26 *	-30	-21
Reed Bunting	559	-7	6	30 *	15	49

England: population trends



Trends for 114 species have been produced for England, with Teal and a new addition of Firecrest reaching the reporting threshold for five-year trends (published online). Table 3 displays the 112 species reaching the threshold for 25-year and/or 10-year trends.

STATISTICALLY SIGNIFICANT RESULTS

Period	No. species	Greatest change in English trends
Long-term (95–20) increases	37	Red Kite: 25,276%
Long-term (95–20) declines	39	Turtle Dove: -96%
Short-term (19–21) increases	14	Ring Ouzel: 58%
Short-term (19–21) declines	27	Willow Tit: -51%

Indian Peafowl and **Marsh Harrier** reach the reporting thresholds for 10- and five-year trends, **Golden Plover**, **Ring Ouzel** and **Crossbill** reach, or historically reached, the 10-year reporting threshold and **Willow Tit**, **Turtle Dove** and **Whinchat** reach, or previously reached, the 25- and 10-year reporting thresholds.

FIRECREST

Likely due to a combination of increased coverage and population change, **Firecrest** has reached the five-year threshold for reporting, and the news is positive. Although not statistically significant, the trend is indicating a 19% increase since 2015.

Bird Atlas data shows a staggering 935% increase in 10-km square occupancy between the 1968–72 and 2007–11 atlases. The breeding population is localised, with the New Forest in Hampshire being a particular stronghold. At a European scale, the species has spread north and eastward, possibly linked to climate change, although other factors are suspected, especially during early population expansion before the effects of climate change were apparent.

AGAINST THE TREND

At a UK-scale, **Oystercatcher** has declined over the last 25 years. In England, the population change

has been that of a 48% increase between 1995 and 2020. The species has undergone a breeding range expansion from coastal to inland sites; the reason for this is unknown but **Oystercatcher** is considered an adaptable species.

EXTINCTION?

Now extinct at many former haunts, **Willow Tit** continues to decline in England. Deterioration in the quality of woodland, e.g. less wet woodland, increasing deer browsing, removal of deadwood, maturation of suitable habitat and habitat fragmentation are thought to be key to this species decline. Competition and/or nest predation from species such as other tits, **Jay**, **Great Spotted Woodpecker**, **Nuthatch** and **Grey Squirrel** may also be playing a role.



◀ With a decline of 27% (1995–2020) recorded by the BBS, and a decline of 55% (1999–2020) recorded by the WBBS, **Sedge Warbler** has moved to the Amber List of Birds of Conservation Concern 5 (see page 8).

▼ Red-listed **Willow Tit** has declined by 86% (1995–2020).

BBS index for England 1994–2021
Willow Tit.

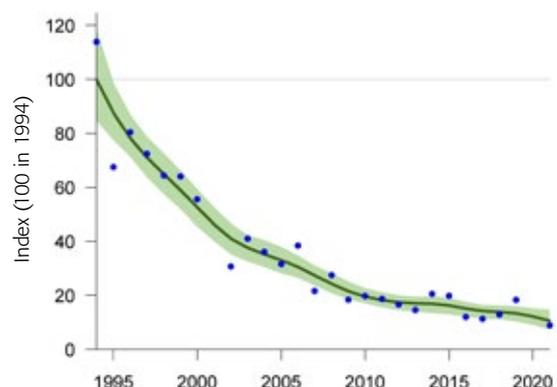


Table 3 Trends in England during 2019–21, 2010–20 and 1995–2020.

Species	Min. sample	2-year (19–21)	10-year (10–20)	25-year (95–20)	LCL	UCL
Canada Goose	512	10	13	82 *	37	150
Greylag Goose	239	19	28 *	311 *	147	694
Mute Swan	236	5	24 *	37	-1	111
Egyptian Goose	32	-3	23	1,198 *	355	>10,000
Shelduck	127	16	-12	37	-27	89
Mandarin Duck	36	53 *	88 *	628 *	307	1,802
Gadwall	47	-19	90 *	210 *	73	525
Mallard	1,199	5	-10 *	16 *	6	27
Tufted Duck	143	-13	-20	3	-25	45
Red Grouse	88	4	8	9	-23	54
Grey Partridge	183	12	-24 *	-60 *	-67	-51
Pheasant	1,708	11 *	9 *	44 *	34	54
Indian Peafowl	43	-37 *	-34	-	-	-
Red-legged Partridge	589	16 *	10 *	27 *	12	47
Swift	899	6	-39 *	-60 *	-66	-54
Cuckoo	450	3	-17 *	-71 *	-74	-67
Feral Pigeon	597	7	4	-20 *	-30	-9
Stock Dove	853	15 *	44 *	36 *	23	55
Woodpigeon	2,207	5 *	-6 *	37 *	29	44
Turtle Dove	39	-44	-81 *	-96 *	-98	-95
Collared Dove	1,262	-13 *	-32 *	-18 *	-24	-11
Moorhen	619	-4	-23 *	-23 *	-31	-14
Coot	258	-16 *	-21 *	0	-21	24
Little Grebe	58	-26	8	7	-27	74
Great Crested Grebe	69	12	4	-6	-33	35
Oystercatcher	216	-5	0	48 *	22	84
Lapwing	575	-2	-22 *	-34 *	-43	-25
Golden Plover	31	1	-20	-	-	-
Curlew	348	6	2	-29 *	-41	-15
Snipe	96	-3	44 *	27	-10	81
Common Sandpiper	32	-4	4	-31 *	-54	-1
Redshank	62	-12	-27	-47 *	-64	-24
(Common Tern)	63	7	14	56	-18	142
(Cormorant)	225	-3	2	19	-4	52
(Grey Heron)	569	6	-15 *	-21 *	-30	-10
(Little Egret)	57	-3	61 *	2,113 *	678	
Sparrowhawk	293	1	-27 *	-33 *	-41	-24
Marsh Harrier	41	-37 *	14	-	-	-
Red Kite	166	7	209 *	25,276 *	>10,000	>10,000
Buzzard	876	-3	25 *	220 *	171	278
(Barn Owl)	51	25	-23 *	236 *	126	487
Little Owl	71	19	-42 *	-67 *	-74	-55
(Tawny Owl)	84	-11	-3	-19	-36	2
Kingfisher	51	-24	-20	-28	-47	4
Gt Spotted Woodpecker	1,073	4	-6 *	109 *	96	125
Green Woodpecker	826	7	-23 *	17 *	8	28
Kestrel	605	9	-16 *	-26 *	-33	-19
Hobby	44	-1	-21	-12	-37	31
Peregrine	34	-11	-18	22	-21	150
Ring-necked Parakeet	96	15	101 *	1,935 *	869	>10,000
Jay	746	-4	-5	2	-6	11
Magpie	1,748	3	3 *	0	-5	5
Jackdaw	1,599	2	24 *	81 *	66	99
Rook	1,140	5	-1	-10	-20	0
Carrion Crow	2,160	3	4	26 *	17	36
Raven	189	0	32 *	35	-31	365
Coal Tit	627	-19 *	-2	26 *	8	45
Marsh Tit	138	-36 *	-23 *	-44 *	-53	-30
Willow Tit	27	-51 *	-38 *	-86 *	-92	-80
Blue Tit	2,079	-7 *	-4 *	0	-4	5
Great Tit	1,980	-17 *	-9 *	28 *	22	34
Skylark	1,499	7 *	4	-19 *	-24	-14
Sand Martin	89	-21	6	-1	-37	44
Swallow	1,644	-18 *	-49 *	-29 *	-35	-24
House Martin	748	-38 *	-39 *	-50 *	-55	-43
Cetti's Warbler	35	57 *	198 *	494 *	179	4,454
Long-tailed Tit	962	-25 *	-12 *	8	-3	19
Willow Warbler	945	-9 *	-25 *	-48 *	-54	-42
Chiffchaff	1,509	19 *	20 *	113 *	101	128
Sedge Warbler	198	-4	-28 *	-27 *	-43	-5
Reed Warbler	136	8	1	27 *	3	62
Grasshopper Warbler	41	37	-34 *	-45 *	-60	-10
Blackcap	1,594	-10 *	42 *	157 *	139	174
Garden Warbler	377	-28 *	-19 *	-34 *	-43	-22
Lesser Whitethroat	292	-27 *	8	6	-8	25
Whitethroat	1,298	-8 *	-10 *	17 *	9	25
Goldcrest	645	-10 *	5	18	-2	35
Wren	2,125	-3 *	20 *	19 *	14	24
Nuthatch	520	-16 *	23 *	126 *	102	156
Treecreeper	296	-28 *	0	-6	-21	12
Starling	1,480	0	-15 *	-61 *	-65	-58
Song Thrush	1,744	13 *	6 *	22 *	15	29
Mistle Thrush	945	-3	-17 *	-45 *	-50	-41
Blackbird	2,181	-2	-5 *	15 *	11	19
Ring Ouzel	28	58 *	19	-	-	-
Spotted Flycatcher	108	-9	-36 *	-72 *	-79	-65
Robin	2,083	16 *	10 *	29 *	24	35
Nightingale	33	6	-1	-47 *	-71	-4
Redstart	107	9	-1	-7	-29	25
Whinchat	31	-36	-16	-54 *	-73	-35
Stonechat	76	11	91 *	170 *	84	336
Wheatear	204	36 *	-35 *	-23	-45	6
Dipper	31	-24	-33 *	-60 *	-81	-26
Tree Sparrow	157	-21 *	-5	48 *	12	94
House Sparrow	1,432	-8 *	1	-13 *	-21	-7
Dunnock	1,868	1	-6 *	10 *	4	16
Yellow Wagtail	165	4	29 *	-35 *	-49	-16
Grey Wagtail	160	2	0	2	-17	22
Pied Wagtail	1,026	-3	-4	-17 *	-23	-10
Meadow Pipit	454	9	-8	-21 *	-32	-9
Tree Pipit	74	-36 *	-42 *	-68 *	-80	-52
Chaffinch	2,126	-12 *	-41 *	-34 *	-37	-30
Bullfinch	539	-21 *	-4	-5	-13	6
Greenfinch	1,515	-2	-63 *	-66 *	-68	-63
Linnet	1,058	13 *	7	-24 *	-30	-16
Lesser Redpoll	68	40	-14	-20	-58	43
Crossbill	35	6	-44 *	-	-	-
Goldfinch	1,609	-8 *	34 *	148 *	131	167
Siskin	84	21	4	64	-1	234
Corn Bunting	141	32	26	-17	-42	13
Yellowhammer	1,088	6 *	-14 *	-33 *	-37	-28
Reed Bunting	420	-5	5	35 *	20	57

INTERPRETING THE RESULTS: see page 15
TREND GRAPHS ONLINE: www.bto.org/bbs-graphs
TREND TABLES ONLINE: www.bto.org/bbs-tables



Scotland: population trends

Here population trends for 68 species in Scotland, where the sample size meets the 30-square threshold for 25- and 10-year time periods, are published. Three species trends are also published online where the threshold is met only for the five-year trends, making the total number of Scottish species trends 71.

STATISTICALLY SIGNIFICANT RESULTS

Period	No. species	Greatest change in Scottish trends	
Long-term (95–20) increases	24	Chiffchaff:	982%
Long-term (95–20) declines	13	Greenfinch:	-68%
Short-term (19–21) increases	8	Kestrel:	65%
Short-term (19–21) declines	5	Swift:	-49%

The species with five-year trends only are **Spotted Flycatcher**, with a decline of 54% (2015–20), and new additions of **Sparrowhawk** and **Whinchat** (see page 21). **Stock Dove**, **Jay**, **Garden Warbler** and **Crossbill** have reached the thresholds for 10- and five-year periods and all reported species have a two-year trend (2019–2021).

WADING THROUGH TRENDS

Curlew and **Lapwing** have both suffered a decline of 60%, **Oystercatcher** of 36% and **Common Sandpiper** of 28% between 1995 and 2020. Although not statistically significant, **Snipe** is showing an 18% increase and **Golden Plover**, an 8% decline through the same time period. These patterns mirror changes seen across the UK for these species, with the exception of **Oystercatcher** in England, where it is increasing.

The BBS data for species below the trend reporting threshold are used for other research, and an example of such work is illustrated for several additional wader species on pages 10–11.

KESTREL CRISIS

As research continues into the 65% long-term decline seen in **Kestrel** in Scotland, a number of theories are coming to light. These include localised competition from other – increasing and expanding – raptor populations, rodenticides, and farming practices. These possible impacts have not yet been linked directly to the population change recorded though.

Furthermore, it is not apparent why the severity of the declines varies between countries, with Scottish declines being more severe than elsewhere in the UK.

IMPRESSIVE INCREASES

The increases recorded in Scotland for a number of species remain impressive. Species such as **Great Spotted Woodpecker**, **Chiffchaff**, **Blackcap**, **Tree Sparrow** and **Goldfinch** have seen percentage increases in the hundreds: 405%, 982%, 616%, 485% and 243% respectively, since 1995.

For many of these species, a UK expansion in range, moving northwards and westwards is thought

to have contributed to these changes, possibly related to climate change.

For **Tree Sparrow** and **Goldfinch**, the cause could be more closely related to food availability especially during the winter months – for **Tree Sparrow**, in cereal stubble fields (undersown with grass) and weedy brassica fodder crops, and for **Goldfinch**, garden feeding stations. It should be noted though, that for **Tree Sparrow** at a UK-scale, for every individual today there were perhaps around 20 in the 1970s, the decline witnessed in the 1970s to early 1990s largely attributed to agricultural intensification.

COVERAGE IN SCOTLAND

These trends, and the strength of these trends, are reliant on good coverage of all habitats in Scotland. Huge thanks are due to all involved after a record year of coverage in the 2021 season.

BBS index for Scotland 1994–2021
Kestrel.

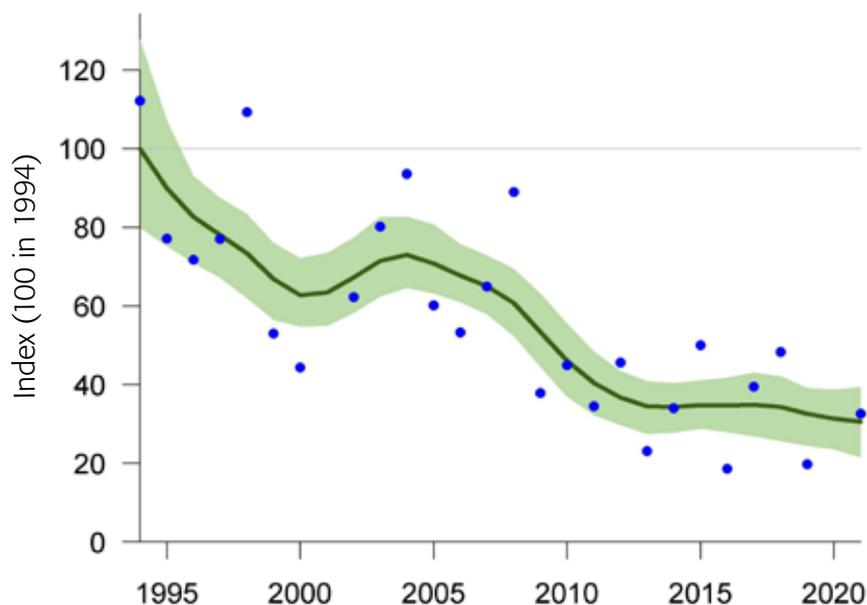


Table 4 Trends in Scotland during 2019–21, 2010–20 and 1995–2020.

Species	Min. sample	2-year (19–21)	10-year (10–20)	25-year (95–20)	LCL	UCL
Greylag Goose	38	-9	-16	92	-54	650
Mallard	123	2	7	-10	-28	8
Red Grouse	62	-29 *	4	0	-25	32
Pheasant	167	-9	-4	16	-8	47
Swift	57	-49 *	-27	-59 *	-74	-41
Cuckoo	92	8	75 *	69 *	38	111
Feral Pigeon	76	41 *	-30 *	-17	-41	15
Stock Dove	31	42	40	-	-	-
Woodpigeon	249	-1	-3	5	-17	31
Collared Dove	63	19	3	10	-37	82
Oystercatcher	145	8	-12 *	-36 *	-50	-21
Lapwing	83	-19	-29 *	-60 *	-72	-50
Golden Plover	41	-6	13	-8	-31	28
Curlew	132	-18	-18 *	-60 *	-67	-50
Snipe	68	29	-14	18	-9	51
Common Sandpiper	38	-12	-15	-28 *	-45	-9
(Grey Heron)	58	-23	-3	5	-31	55
Buzzard	171	4	-3	30 *	6	56
Gt Spotted Woodpecker	69	41 *	11	405 *	263	686
Kestrel	36	65 *	-32	-65 *	-78	-48
Jay	45	13	71 *	-	-	-
Magpie	67	-1	36 *	72 *	29	155
Jackdaw	145	-27	17	54 *	17	103
Rook	126	-7	-1	-34 *	-55	0
Carrion Crow	231	7	-6	-5	-25	17
Hooded Crow	57	-7	-36 *	-47 *	-67	-23
Raven	64	-23	35	60 *	14	117
Coal Tit	155	-12	-13	-5	-25	17
Blue Tit	196	-4	0	10	-5	28
Great Tit	189	-4	-5	47 *	20	78
Skylark	243	0	7	-3	-14	12
Sand Martin	39	40	7	69	-40	486
Swallow	210	-7	-35 *	-4	-21	17
House Martin	82	-31 *	-20	70 *	13	143

Species	Min. sample	2-year (19–21)	10-year (10–20)	25-year (95–20)	LCL	UCL
Long-tailed Tit	39	9	51 *	99 *	30	199
Willow Warbler	251	6	7	35 *	20	56
Chiffchaff	84	31 *	142 *	982 *	549	2011
Sedge Warbler	63	-12	-27 *	6	-26	50
Blackcap	89	-4	72 *	616 *	378	1073
Garden Warbler	33	21	-22	-	-	-
Whitethroat	101	-15	0	118 *	34	201
Goldcrest	105	-34 *	-9	-3	-28	32
Wren	269	-13 *	13 *	33 *	17	50
Treecreeper	44	57 *	-1	4	-30	39
Starling	169	-16	-7	-31 *	-48	-10
Song Thrush	214	4	32 *	37 *	17	59
Mistle Thrush	91	49 *	28 *	26	-11	96
Blackbird	236	4	1	30 *	9	54
Robin	235	0	-1	13	-3	28
Stonechat	45	-25	38 *	102 *	43	234
Wheatear	93	16	-36 *	-35 *	-48	-19
Tree Sparrow	36	2	79 *	485 *	159	1275
House Sparrow	120	2	13 *	56 *	24	100
Dunnock	167	16	-19 *	28 *	11	53
Grey Wagtail	34	-32	0	-17	-47	23
Pied Wagtail	156	0	-14	-26 *	-41	-11
Meadow Pipit	249	0	17 *	-13 *	-23	-3
Tree Pipit	43	-3	15	80 *	26	153
Chaffinch	283	-1	-24 *	-8	-17	2
Bullfinch	53	13	23 *	48 *	3	112
Greenfinch	107	5	-62 *	-68 *	-76	-56
Linnet	102	47 *	13	12	-17	46
Lesser Redpoll	60	-3	24	48	-7	126
Crossbill	31	-44	-54 *	-	-	-
Goldfinch	127	7	40 *	243 *	171	358
Siskin	91	26 *	-26 *	17	-12	57
Yellowhammer	127	-8	-2	23	0	46
Reed Bunting	74	-10	19	61 *	20	107



NEW FIVE-YEAR TRENDS

Both Sparrowhawk and Whinchat join the suite of species for which we can produce population trends in Scotland.

This is likely due to increased coverage by volunteers in Scotland and/or expanding population increases or distribution increasing sample sizes during surveys. In these two cases, increased coverage appears to have been at play.

Sparrowhawk shows a 1% decline between 2015 and 2020 and Whinchat a 2% decline over the same time period. Neither are statistically significant results.



Wales: population trends



Trends for 60 species are reported for Wales and all species are displayed here. Grey Wagtail and Lesser Redpoll reached the reporting threshold for 10- and five-year trends, while Yellowhammer has only a 23-year trend. All species reported also have the short-term, two-year (2019–21) trend in place of the usual one-year trend, not possible due to COVID-19 restrictions impacting on UK-wide coverage in 2020.

STATISTICALLY SIGNIFICANT RESULTS

Period	No. species	Greatest change in Welsh trends
Long-term (95–20) increases	17	Canada Goose: 429%
Long-term (95–20) declines	14	Greenfinch: -79%
Short-term (19–21) increases	5	Wheatear: 70%
Short-term (19–21) declines	12	Yellowhammer: -51%

GOLDCREST SHRINKING

With a decline of 53% over the last 25 years, the **Goldcrest** trend for Wales is unique across the UK. Whilst susceptible to harsh winter weather, there is no clear reason why the populations would be most impacted in Wales. In addition, this species has a high breeding potential allowing recoveries from cold winters.

With such a contrasting trend to the rest of the UK, where the species is increasing or stable, **Goldcrest** is a species for concern in Wales.

CURLEW FALLS

Also declining in Wales is **Curlew**. The trend here mirrors those seen elsewhere across the UK. At some breeding sites, predation can pose a threat to breeding **Curlew** – but they can also be impacted by the creation of new woodland as they need more open landscapes in which to nest. Research is taking place in Wales to investigate movements and habitat preferences using Global Positioning System (GPS) tags attached to birds to track their movements. So far, the investigation has revealed the

importance of a mosaic of habitats at a landscape scale to help support **Curlew** populations.

BETTER NEWS

In Wales, **Stonechat** has increased by an impressive 256% since 1995. This species has undergone complex shifts in range, with expansion northwards across the UK and westwards into Wales. Not only that, but research has also found that the species is increasingly inhabiting higher elevations. The reasons for this are unknown, likely a response to warmer winters – but that is at odds with one of the suggestions contributing to **Goldcrest** declines in Wales.

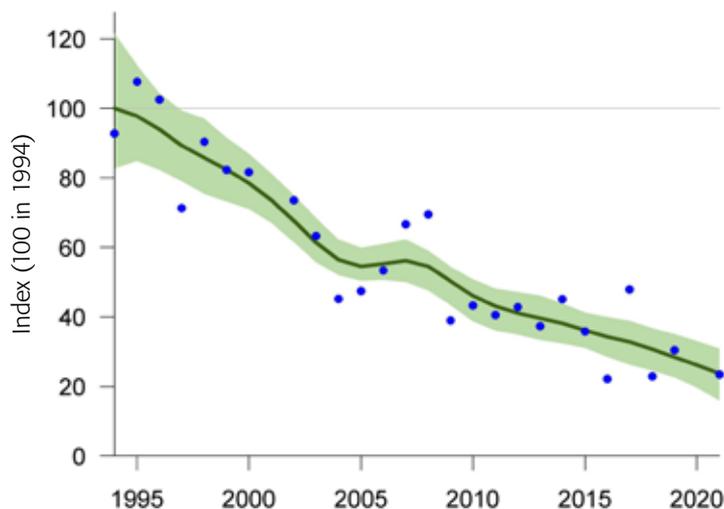
Red Kite continue to flourish, with an increase of 376% in Wales since 1995.

▶ A 73% decline has been recorded in **Curlew** in Wales since 1995.

▼ **Goldcrest** populations in Wales have declined by 53% from 1995 to 2020. The reason is unknown.



BBS index for Wales 1994–2021
Curlew.



INTERPRETING THE RESULTS: see page 15
TREND GRAPHS ONLINE: www.bto.org/bbs-graphs
TREND TABLES ONLINE: www.bto.org/bbs-tables

Table 5 Trends in Wales during 2019–21, 2010–20 and 1995–2020.

Species	Min. sample	2-year (19–21)	10-year (10–20)	25-year (95–20)	LCL	UCL
Canada Goose	35	16	28	429 *	171	1143
Mallard	76	13	14	-3	-45	70
Pheasant	109	-8	14	45 *	5	104
Swift	66	-8	-54 *	-74 *	-82	-55
Cuckoo	65	-1	43 *	-5	-32	39
Feral Pigeon	39	-9	5	36	-3	86
Stock Dove	36	-9	4	71	-8	183
Woodpigeon	212	5	-11	20	-1	44
Collared Dove	82	-13	-12	25	-10	80
Curlew	31	-23	-43 *	-73 *	-84	-57
(Grey Heron)	45	-4	15	-3	-44	80
Red Kite	35	5	76 *	376 *	175	1020
Buzzard	157	-22 *	-17 *	-15	-30	5
Gt Spotted Woodpecker	98	1	12	225 *	155	311
Green Woodpecker	47	-6	-24 *	-38 *	-55	-17
Jay	85	8	25 *	65 *	33	143
Magpie	178	4	-14 *	-27 *	-38	-9
Jackdaw	156	-24 *	-14	10	-31	96
Rook	81	-51 *	-55 *	-63 *	-73	-48
Carrion Crow	228	-2	-6	1	-16	23
Raven	105	-11	-8	21	-21	95
Coal Tit	84	-34 *	-14	-25	-45	2
Blue Tit	199	-13 *	-18 *	-3	-16	11
Great Tit	191	-10	-21 *	23 *	5	43
Skylark	113	-6	-14	-24 *	-39	-6
Swallow	191	-26 *	-40 *	-19	-34	2
House Martin	92	-46 *	-47 *	-40 *	-58	-20
Long-tailed Tit	68	-25	-32 *	-10	-34	25
Willow Warbler	174	-15 *	-17 *	-17 *	-33	-1
Chiffchaff	164	12 *	3	62 *	36	95
Blackcap	148	-11 *	41 *	197 *	144	274
Garden Warbler	61	-24	-29 *	-34	-56	3
Whitethroat	94	-20 *	-23 *	-25	-41	2
Goldcrest	92	14	6	-53 *	-67	-25
Wren	222	-2	34 *	24 *	12	40
Nuthatch	82	0	-4	41 *	13	77
Treecreeper	45	1	6	4	-29	47
Starling	83	0	14	-63 *	-76	-45
Song Thrush	187	19 *	9	29 *	11	50
Mistle Thrush	112	9	16 *	10	-14	35
Blackbird	222	6	4	46 *	33	60
Robin	216	25 *	12 *	4	-6	15
Redstart	71	-7	-25 *	-3	-23	22
Stonechat	47	29 *	63 *	256 *	134	506
Wheatear	59	70 *	-28 *	-35 *	-48	-11
House Sparrow	143	-8	6	96 *	61	140
Duncock	175	7	2	31 *	9	52
Grey Wagtail	34	-8	12	-	-	-
Pied Wagtail	132	4	-3	-9	-29	20
Meadow Pipit	100	7	-4	-14	-33	9
Tree Pipit	37	-4	-29	-39	-62	4
Chaffinch	219	-12 *	-38 *	-41 *	-48	-30
Bullfinch	70	6	7	-1	-27	25
Greenfinch	107	-16	-79 *	-79 *	-85	-72
Linnet	102	1	6	-26	-45	7
Lesser Redpoll	38	39	-20	-	-	-
Goldfinch	152	0	14 *	98 *	62	142
Siskin	35	36	65 *	160 *	61	393
Yellowhammer	31	-51 *	-	-75 *	-87	-62
Reed Bunting	31	6	-5	27	-20	130



Northern Ireland: population trends



With the new addition of Feral Pigeon with a five-year trend (published online), 38 species now reach the 30 square reporting threshold for publishing trends in Northern Ireland. The 2021 survey season in Northern Ireland saw a new coverage record, with 152 squares covered, 100 of which were by volunteers.

STATISTICALLY SIGNIFICANT RESULTS

Period	No. species	Greatest change in Northern Irish trends	
Long-term (95–20) increases	15	Blackcap:	1,650%
Long-term (95–20) declines	2	Greenfinch:	-84%
Short-term (19–21) increases	0	–	–
Short-term (19–21) declines	4	House Martin:	-34%

NEW TRENDS

Of the 38 species for which trends are possible, **Feral Pigeon** has a five-year trend only, which shows a 25% increase, although this is not currently statistically significant.

Lesser Redpoll has a 10-year trend, **Sedge Warbler** has five- (a decline of 3%; published online) and 10-year trends, **Greenfinch** has 25- and 10-year trends and **Skylark** has a 25-year long-trend only.

Just below the reporting threshold are species such as **Raven** and **Grey**

Heron. With the coverage increases achieved in 2021 – which was the highest coverage level to date – more species trends could become a reality in coming years. Thank you to all who make these trends possible!

THE LARK DESCENDING

Skylark has seen its breeding population decline across the UK. This is reflected most severely in Northern Ireland where it has declined by 46% over the last 25 years. Agricultural intensification has played a part in these declines in several ways, for

example, the switch from hay to silage, with cutting now occurring throughout the breeding season, together with a significant decline in arable farming in the country. Spring-sown cereal is an important nesting habitat for **Skylark**, with the stubbles also providing important seed sources over winter. Increased use of pesticides is thought to have contributed to a reduction in summer food for adults and chicks.

Skylark in the uplands are thought to have been impacted by intensification and changes in management.

IMPRESSIVE INCREASES

In contrast, **Mallard**, **Woodpigeon**, **Buzzard**, **Hooded Crow**, **Great Tit**, **Blackcap** and **Goldfinch** have all undergone impressive increases over the last 25 years.

Table 6 Trends in Northern Ireland during 2019–21, 2010–20 and 1995–2020.

Species	Min. sample	2-year (19–21)	10-year (10–20)	25-year (95–20)	LCL	UCL	Species	Min. sample	2-year (19–21)	10-year (10–20)	25-year (95–20)	LCL	UCL
Mallard	31	-37	14	225 *	8	434	Goldcrest	49	0	3	28	-16	109
Pheasant	45	-7	-28 *	93 *	11	343	Wren	97	-10 *	22 *	58 *	18	108
Woodpigeon	90	-10	16 *	119 *	68	200	Starling	83	-10	1	18	-14	61
Collared Dove	39	-24 *	15	87 *	12	422	Song Thrush	83	4	23 *	71 *	32	116
Buzzard	37	2	27	1,303 *	628	3,445	Mistle Thrush	61	-9	-13	-22	-65	61
Magpie	87	-9	-17 *	-6	-29	20	Blackbird	91	2	13 *	44 *	15	73
Jackdaw	81	-8	-5	60 *	21	122	Robin	93	-1	11 *	22	-6	41
Rook	77	9	-7	-16	-42	22	House Sparrow	61	-2	7	40	-7	160
Hooded Crow	87	-16 *	40 *	178 *	112	274	Dunnock	75	-3	-1	57 *	2	126
Coal Tit	68	-8	-23 *	28	-13	85	Pied Wagtail	50	-15	-6	22	-19	102
Blue Tit	82	-10	-2	1	-23	31	Meadow Pipit	65	3	21 *	1	-25	43
Great Tit	79	-11	-10 *	128 *	72	178	Chaffinch	96	-6	-16 *	19	-8	38
Skylark	31	-7	–	-46 *	-63	-31	Bullfinch	36	-23	-9	2	-31	43
Swallow	88	0	-34 *	-28	-44	1	Greenfinch	37	20	-83 *	-84 *	-91	-70
House Martin	48	-34 *	-5	47	-14	157	Linnet	37	-19	-47 *	-16	-44	27
Willow Warbler	84	-2	-28 *	31 *	5	63	Lesser Redpoll	31	-24	-57 *	–	–	–
Chiffchaff	38	-14	-10	16	-5	68	Goldfinch	57	-4	11	513 *	270	1,208
Sedge Warbler	32	10	-47 *	–	–	–	Reed Bunting	33	-2	-18	-34	-57	7
Blackcap	48	-7	78 *	1,650 *	1,079	3,101							

INTERPRETING THE RESULTS: see page 15

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

Channel Islands

Nineteen squares were surveyed on the Channel Islands in 2021. These data, and those from the Isle of Man, feed into the UK trends.

Fifteen volunteers surveyed the 19 squares covered on the Channel Islands in 2021. The result was data collection for 77 bird species.

Of these, the most numerous were **Herring Gull** with 510 individuals counted, **House Sparrow** with 493 counted and **Woodpigeon** with a total count of 403 individuals.

The most widespread species were **Woodpigeon**, **Magpie**, **Carrion Crow**, **Wren**, **Blackbird** and **Robin**, all of which were seen on 100% of squares covered in either or both of the Early and Late visits. At the other end of the scale, the rarest encounters were singles of **Short-toed Treecreeper** (not rare, but distribution is limited by habitat preference), **Jack Snipe** and **Common Sandpiper**, the latter two presumably travelling through on passage or having overwintered.



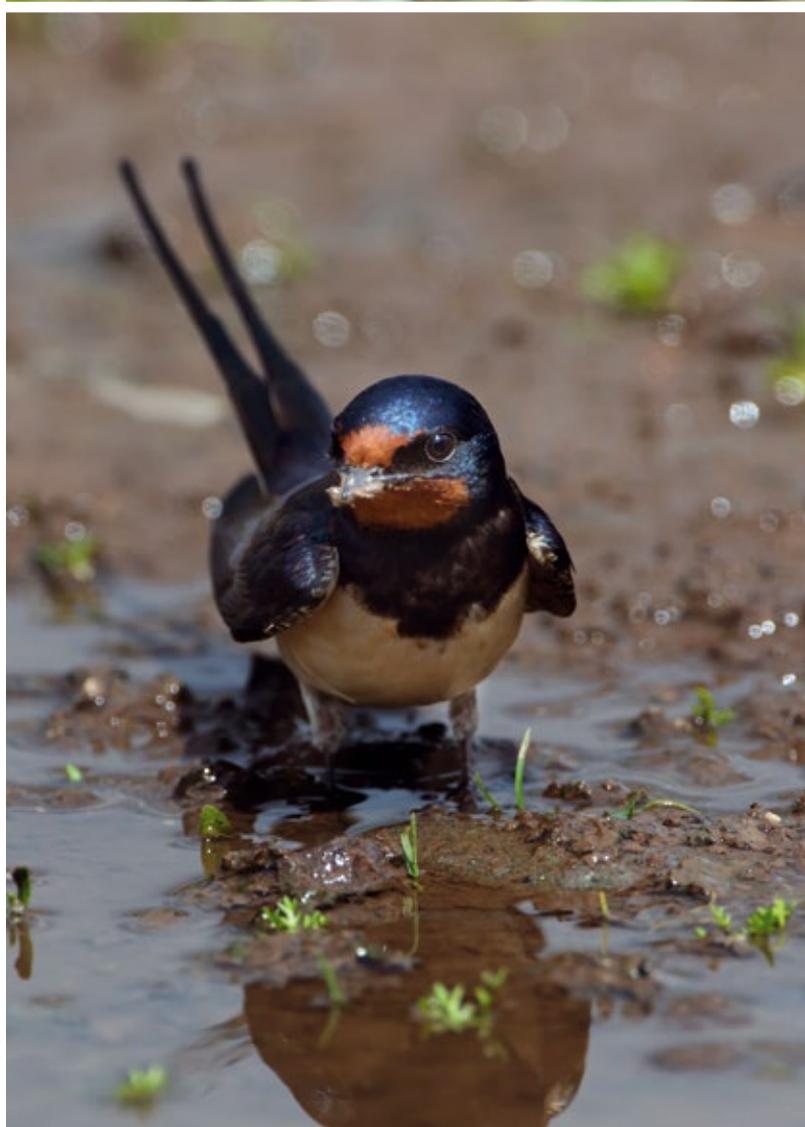
Isle of Man

Record coverage was achieved on the Isle of Man in 2021 as the survey here goes from strength to strength. Ten squares were surveyed.

Nine volunteers surveyed the record breaking 10 squares and along the way counted 259 **Herring Gulls**, 146 **Jackdaws** and 82 **Meadow Pipits** – making these the most numerous species on the Isle of Man BBS squares.

Most widespread across the squares were **Swallow**, **Wren** and **Blackbird** which were recorded on 90% of squares covered.

The rarest records were singles of **Coot**, **Wheatear** and **Fieldfare**, despite the first two of these species being breeding birds on the Isle of Man. In addition, three records of **Hen Harrier** were logged on two squares, which, although known to breed on the island, still makes for an enjoyable sight.



English Regions: population trends



Long-term population trends calculated for nine English Regions for a total of 79 species are published in this report. Further trends covering 10- and five-year time periods for English Regions are available online, with additional species for English region reporting, including Redstart in the West Midlands.

Here, long-term trends are reported for English Regions where the given species has been recorded on 30 or more squares per year, on average, since the survey was launched in 1994. Online, five-, 10- and two-year trends are published where the sample threshold is met, visit www.bto.org/bbs-results.

In addition to the species listed in Table 8, **Redstart** is reported online for five- and 10-year trends with non-statistically significant decrease of 1% and increase of 32% respectively for the West Midlands.

A summary of the regional coverage and 25-year trends, along with the total number of statistically significant trends can be seen in Table 7. It is hoped that, as coverage increases, it will be possible to report regional trends for other countries within the UK too.

STRONGEST CHANGES

Of the statistically significant trends for regions, the strongest increases included **Buzzard** in four regions and **Red-legged Partridge, Red Kite, Chiffchaff** and **Goldfinch** in one region each. The strongest decreases included **Cuckoo** in four regions,

Swift in two regions, and **Turtle Dove** and **Mistle Thrush** in single regions.

HIGHS AND LOWS

Both **Red Kite** and **Buzzard** continue to increase in the English Regions where trends are possible. For **Red Kite**, there are shorter-term (five- and 10-year) trends published online for the East Midlands, East of England and the South West, where thresholds are met.

The populations of both species have expanded across England, with reduced illegal killing and, for **Red Kite**, following successful reintroduction programmes.

For other species, the fortunes are less favorable. The declines recorded in **Cuckoo** are increasingly well understood, with reduced survival during migration to and from Africa for the winter and a reduced food supply on breeding grounds here in the UK being considered the main drivers of change. The story is quite different for species such as **Swift** and **Mistle Thrush**, where the reasons driving their population declines are poorly understood.

▼ The species most frequently topping the lists for statistically significant increase or decline across English Regions are **Buzzard** and **Cuckoo** respectively, both in four of the nine English Regions each.



Table 7 Counties in each region, coverage in 2021, trends produced, and statistically significant changes.

Region	Counties	Number of squares covered in 2021	No. of trends	Significant increases	Significant declines
1 North West	Cheshire, Cumbria, Lancashire, Greater Manchester, Merseyside	214	56	20	15
2 North East	Cleveland, County Durham, Northumberland	146	40	9	10
3 Yorkshire & Humber	East Yorkshire, North Lincolnshire, North Yorkshire, South Yorkshire, West Yorkshire	268	56	21	13
4 East Midlands	Derbyshire, Northamptonshire, Leicestershire & Rutland, Lincolnshire, Nottinghamshire	276	58	21	13
5 East of England	Bedfordshire, Cambridgeshire, Essex, Hertfordshire, Norfolk, Suffolk	378	68	22	23
6 West Midlands	Birmingham, Herefordshire, Shropshire, Staffordshire, Warwickshire, Worcestershire	213	54	23	14
7 South East	Berkshire, Buckinghamshire, Hampshire, Isle of Wight, Kent, Oxfordshire, Surrey, Sussex	694	68	20	27
8 South West	Avon, Cornwall, Devon, Dorset, Gloucestershire, Somerset, Wiltshire	543	61	14	18
9 London	Greater London	83	27	11	9

Table 8 Trends in English Regions during 1995–2020.

Species	North West		North East		Yorkshire & Humber		East Midlands		East of England		West Midlands		South East		South West		London	
	95–20	Sample	95–20	Sample	95–20	Sample	95–20	Sample	95–20	Sample	95–20	Sample	95–20	Sample	95–20	Sample	95–20	Sample
Canada Goose	145 *	74	–	–	229 *	35	61	46	18	61	57 *	73	51 *	131	124	56	–	–
Greylag Goose	–	–	–	–	916 *	46	647 *	36	122 *	53	–	–	112	45	–	–	–	–
Mute Swan	–	–	–	–	–	–	–	–	168 *	43	–	–	-27	59	21	39	–	–
Shelduck	–	–	–	–	–	–	–	–	8	37	–	–	–	–	–	–	–	–
Mallard	18	160	83 *	37	23	111	7	112	-3	196	27 *	121	26	252	25 *	166	-31 *	43
Tufted Duck	–	–	–	–	–	–	–	–	–	–	–	–	17	32	–	–	–	–
Red Grouse	–	–	–	–	12	51	–	–	–	–	–	–	–	–	–	–	–	–
Grey Partridge	–	–	–	–	-63 *	30	-37	32	-52 *	43	–	–	–	–	–	–	–	–
Pheasant	141 *	147	40 *	77	78 *	160	28 *	166	-6	287	103 *	146	39 *	416	65 *	300	–	–
Red-legged Partridge	–	–	–	–	15	56	-35 *	78	-3	185	77 *	37	155 *	132	198 *	66	–	–
Swift	-74 *	103	-77 *	33	-57 *	86	-51 *	81	-37 *	149	-60 *	72	-66 *	171	-66 *	146	-59 *	58
Cuckoo	-39 *	32	–	–	-66 *	44	-78 *	47	-67 *	102	-81 *	50	-76 *	157	-81 *	71	–	–
Feral Pigeon	-23	76	–	–	-43 *	64	-13	51	-6	77	-25	43	1	115	-25	71	-17	74
Stock Dove	22	60	–	–	94 *	60	-4	83	20	152	87 *	90	67 *	228	31 *	142	–	–
Woodpigeon	79 *	221	35	91	101 *	185	35 *	206	23 *	335	23 *	188	20 *	520	48 *	379	47 *	84
Turtle Dove	–	–	–	–	–	–	–	–	-97 *	53	–	–	-96 *	38	–	–	–	–
Collared Dove	-6	134	-36	35	-42 *	86	-17	114	19	212	-41 *	117	-17 *	307	-18 *	205	-27 *	53
Moorhen	-25	69	–	–	12	41	-33 *	61	-30 *	125	-16	60	-39 *	146	-24	73	–	–
Coot	-18	31	–	–	–	–	19	30	-14	39	57	31	-7	67	–	–	–	–
Oystercatcher	4	62	28	31	243 *	52	–	–	44 *	36	–	–	–	–	–	–	–	–
Lapwing	-26 *	115	-23	49	-4	113	-61 *	61	-42 *	73	-51 *	38	-63 *	98	–	–	–	–
Curlew	-46 *	90	-24 *	53	11	117	–	–	–	–	–	–	–	–	–	–	–	–
Snipe (Cormorant)	–	–	–	–	52	40	–	–	–	–	–	–	–	–	–	–	–	–
(Grey Heron)	-46 *	77	–	–	41	38	-20	52	-37 *	83	9	58	-21	130	-31 *	88	–	–
Sparrowhawk	-43 *	32	–	–	–	–	–	–	-31 *	46	–	–	-35 *	66	-31	50	–	–
Red Kite	–	–	–	–	–	–	–	–	–	–	–	–	19,558*	93	–	–	–	–
Buzzard	100 *	81	6,624*	33	3,081*	50	8,254*	71	27,454*	88	167 *	105	1,176 *	199	5	247	–	–
Gt Spotted Woodpecker	98 *	90	124 *	32	108 *	56	190 *	68	73 *	155	129 *	113	85 *	335	150 *	187	60 *	39
Green Woodpecker	–	–	–	–	–	–	184 *	52	63 *	175	37	65	-1	322	-3	139	13	31
Kestrel	-26	69	–	–	-14	64	7	67	-11	112	-41 *	41	-41 *	136	-52 *	78	–	–
Ring-necked Parakeet	–	–	–	–	–	–	–	–	–	–	–	–	602 *	37	–	–	31,851*	49
Jay	14	72	–	–	–	–	29	35	40 *	124	-19	64	-13 *	250	-4	118	-18	41
Magpie	-13 *	186	-22	40	-17	108	17	157	33 *	253	-6	166	7	441	-10 *	313	42 *	82
Jackdaw	94 *	150	23	69	66 *	131	122 *	136	164 *	238	120 *	146	82 *	405	37 *	301	–	–
Rook	-20	89	-42 *	50	-29	117	14	104	21	184	17	89	-5	269	-21	236	–	–
Carriion Crow	36 *	228	-6	88	39 *	189	50 *	194	96 *	313	10	186	17 *	504	3	374	73 *	83
Raven	–	–	–	–	–	–	–	–	–	–	133 *	32	–	–	-11	86	–	–
Coal Tit	71 *	74	33	45	61	50	7	42	-7	69	33 *	52	7	165	27	112	–	–
Marsh Tit	–	–	–	–	–	–	–	–	–	–	–	–	-38 *	53	-15	31	–	–
Blue Tit	-13 *	207	-20 *	70	-2	162	23 *	191	31 *	314	-8	185	-3	506	-7	362	6	82
Great Tit	23 *	194	49 *	63	28 *	143	48 *	179	19 *	297	16 *	180	19 *	493	41 *	352	113 *	78
Skylark	-22	119	-20 *	76	-9	158	-2	166	-23 *	286	-16 *	119	-17 *	330	-34 *	235	–	–
Swallow	-47 *	196	-37 *	81	-47 *	167	-5	158	-25 *	230	-34 *	146	-22 *	334	-13	317	–	–
House Martin	-27	97	-40	31	-48 *	70	-37 *	60	-52 *	98	-57 *	79	-60 *	144	-53 *	155	–	–
Long-tailed Tit	29	88	–	–	23	56	57 *	86	12	160	-7	91	-23 *	262	19	164	35	34
Willow Warbler	-3	147	-31 *	74	-38 *	123	-44 *	95	-84 *	108	-61 *	90	-85 *	149	-70 *	152	–	–
Chiffchaff	356 *	113	341 *	50	350 *	92	431 *	117	151 *	226	167 *	150	50 *	406	27 *	320	123 *	35
Sedge Warbler	–	–	–	–	–	–	–	–	-26	46	–	–	-22	35	-28	34	–	–
Reed Warbler	–	–	–	–	–	–	–	–	5	42	–	–	-18	35	–	–	–	–
Blackcap	261 *	124	93 *	48	132 *	102	201 *	136	136 *	257	160 *	145	162 *	425	152 *	307	222 *	50
Garden Warbler	–	–	–	–	–	–	-11	34	-33 *	59	-26	45	-35 *	101	-44 *	64	–	–
Lesser Whitethroat	–	–	–	–	–	–	-4	38	29	80	27	30	-21	59	-3	44	–	–
Whitethroat	-15	89	45 *	45	5	90	41 *	147	11	259	25 *	110	40 *	314	-7	223	–	–
Goldcrest	63 *	49	21	30	–	–	58	34	42 *	81	99 *	49	14	213	-35 *	141	–	–
Wren	54 *	219	-5	84	5	90	39 *	196	26 *	310	26 *	182	10 *	498	4	371	28 *	78
Nuthatch	322 *	49	–	–	–	–	–	–	183 *	36	150 *	56	87 *	208	88 *	98	–	–
Treecreeper	–	–	–	–	–	–	–	–	-12	31	–	–	-10	100	-22	55	–	–
Starling	-64 *	173	-53 *	63	-61 *	128	-63 *	136	-43 *	231	-68 *	128	-63 *	343	-70 *	198	-67 *	80
Song Thrush	101 *	171	0	69	65 *	127	45 *	149	1	248	65 *	159	-4	452	10	318	-41 *	51
Mistle Thrush	-34 *	119	-20	42	-39 *	85	-37 *	85	-60 *	131	-31 *	88	-55 *	230	-50 *	132	-67 *	33
Blackbird	43 *	218	19	80	35 *	181	22 *	204	0	327	22 *	188	-1	519	17 *	380	-46 *	84
Robin	49 *	210	19	77	49 *	160	40 *	192	33 *	308	47 *	186	14 *	503	13 *	367	80 *	81
Wheatear	-31	51	–	–	-2	49	–	–	–	–	–	–	–	–	–	–	–	–
Tree Sparrow	39 *	31	–	–	158 *	45	24	32	–	–	–	–	–	–	–	–	–	–
House Sparrow	-5	161	-28	48	-6	107	-13	128	-21 *	198	-6	145	-26 *	321	14	254	-62 *	70
Duncock	22 *	182	20	64	-8	139	7	180	13 *	282	30 *	171	1	449	7	337	14	64
Yellow Wagtail	–	–	–	–	–	–	-10	39	-40 *	49	–	–	–	–	–	–	–	–
Grey Wagtail	–	–	–	–	–	–	–	–	–	–	–	–	–	–	-17	33	–	–
Pied Wagtail	-24	131	-11	52	-21 *	110	-20	100	-5	154	-8	88	-21 *	209	-22 *	160	–	–
Meadow Pipit	-15	90	-12	58	-3	107	-54 *	41	-61 *	41	–	–	-40 *	50	-21	50	–	–
Chaffinch	-28 *	217	-5	89	-7	186	-8	201	-37 *	324	-56 *	183	-47 *	500	-42 *	371	-28	56
Bullfinch	9	44	–	–	131 *	33	62 *	56	-48 *	65	-18	56	-38 *	141	-9	119	–	–
Greenfinch	-53 *	149	-66 *	44	-66 *	102	-58 *	138	-58 *	246	-58 *	137	-76 *	373	-72 *	268	-64 *	56
Linnet	-37 *	90	-28	51	-27 *	101	-25 *	124	-1	181	-22	77	-32 *	233	-28 *	193	–	–
Goldfinch	175 *	172	172 *	60	130 *	136	179 *	151	121 *	232	233 *	136	128 *	369	123 *	297	492 *	55
Corn Bunting	–	–	–	–	–	–	–	–	-34 *	39	–	–	-37	30	–	–	–	–
Yellowhammer	-59 *	52	-47 *	46	-18	93	-18 *	143	-23 *	224	-63 *	101	-40 *	254	-38 *	172	–	–
Red Bunting	-3	65	–	–	114 *	49	89 *	69	34 *	85	–	–	-39 *	63	26	36	–	–

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.

For this report we return to using the standard methods and omit all data from 2020 to prevent the coverage biases from affecting the trends we produce. Although we omit the underlying data, we can estimate a trend value for 2020 by interpolating the smoothed trend line between 2019 and 2021. This is not possible for 1-year changes as these are based on unsmoothed trend values and cannot be interpolated. For this reason we present a two-year change for the period 2019–2021.

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WHINCHAT: LARS JOHANSSON/STOCK.ADOBE.COM

FURTHER READING

Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D. & Win I. 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. (www.britishbirds.co.uk/sites/default/files/BB_Dec21-BoCC5-IUCN2.pdf).

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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.

BBS volunteers have the choice to take part in the recording of mammals during the BBS season, either on core visits, during additional visits or via local knowledge. In 2021, mammal monitoring was conducted on 90% of BBS squares covered.

Thank you to all who take part in the mammal recording element of BBS. The 'live count' data collated contributes to population trends for nine easily detectable widespread terrestrial species. In addition, all data collected contribute to wider research and are particularly useful in distribution-based studies.

As with the bird trends, each of these nine mammal species, where reporting thresholds are met (40+ squares for the UK and 30+ squares for countries and English Regions on average for the time period examined), have trends displayed here. In addition, five-year trends are available online at www.bto.org/bbs-mammals.

DATA RECORDED

Of the 3,919 BBS squares surveyed in 2021, 3,535 received mammal data. These include 394 squares where live mammals and evidence of mammals were looked for but none found. On 131 squares, evidence was found (e.g. from local knowledge, dead mammals or signs of mammals), but no live mammals were seen and counted. Counts of live mammals were made on 3,010 squares.

SPECIES RECORDED

For many species, live counts will have been possible, but for seven, signs and/or local knowledge has allowed

the recording of 'presence' at a square, for example, **European Beaver** and **Daubenton's Bat**. For other species, such as **Rabbit**, **Grey Squirrel** and **Brown Hare**, they were seen and counted on over 1,000 squares. For a list of all the mammal species recorded in 2021, please see Table 9.

CLASSIFYING RISK

Of the nine species for which the BBS can confidently calculate trends, one (**Mountain Hare**) is classed as 'Near-Threatened' by the Mammal Society's Mammal Red List, where 47 UK mammal species have been assessed using the International Union for Conservation of Nature (IUCN) criteria and the results published in 2020. The BBS has recorded a 52% decline from 1996 to 2020 in **Mountain Hare**, suggesting a halving in population in the last 24 years.

A reduction in suitable habitat due to changes in land use and competition for resources with **Brown Hare** are believed to be factors in the decline, but there is also uncertainty over the sustainability of **Mountain Hare** control measures.

For the other eight species for which BBS produces population trends, four were not assessed by the Mammal Society for the mammal Red List as they are non-native, and the remaining three (**Red Fox**, **Red Deer** and **Roe Deer**) were classified as of 'Least Concern'.

Table 9 All mammal species recorded in 2021. 'Squares recorded' include counts of live mammals, field signs, dead mammals and local knowledge.

Species	Squares recorded
Red-necked Wallaby	1
Rabbit	1,665
Brown Hare	1,092
Mountain/Irish Hare	93
European Beaver	2
Grey Squirrel	1,364
Red Squirrel	35
Bank Vole	21
Water Vole	5
Field Vole	29
Wood Mouse	27
House Mouse	2
Brown Rat	55
Hedgehog	30
Common Shrew	24
Pygmy Shrew	2
Water Shrew	1
Lesser White-toothed Shrew	1
Mole	519
Noctule Bat	1
Pipistrelle Bat sp.	5
Daubenton's Bat	1
Domestic Cat	325
Red Fox	469
Grey Seal	8
Common Seal	5
Badger	244
Pine Marten	12
Otter	27
Stoat	51
Weasel	10
Ferret	1
American Mink	4
Wild Boar	5
Reeves' Muntjac	291
Fallow Deer	137
Red Deer	163
Sika Deer	20
Chinese Water Deer	27
Roe Deer	971
Park Cattle	2
Feral Goat	5
Common Dolphin	1
Harbour Porpoise	3

FIND OUT MORE...

Mathews, F. & Harrower, C. 2020. *IUCN-compliant Red List for Britain's Terrestrial Mammals*. Assessment by the Mammal Society under contract to Natural England, Natural Resources Wales and Scottish Natural Heritage. (www.mammal.org.uk/red-list).

▼ Trends are calculated for nine easily detected and widespread terrestrial mammal species, using the 'live count' data recorded during core BBS visits.



Table 10 Mammal trends in UK.

Species	Min. sample	2-year (19–21)	10-year (10–20)	24-year (96–20)	LCL	UCL
Brown Hare	755	26 *	22 *	17 *	5	30
Mountain/Irish Hare	55	-21	8	-52 *	-71	-18
Rabbit	1462	-3	-39 *	-66 *	-72	-59
Grey Squirrel	815	24 *	37 *	40 *	26	56
Red Fox	282	9	-35 *	-46 *	-54	-36
(Red Deer)	72	18	34	77 *	7	174
Roe Deer	481	20 *	49 *	117 *	85	155
(Fallow Deer)	67	38	118 *	190 *	2	608
Reeves' Muntjac	116	22 *	87 *	241 *	127	387

Table 11 Mammal trends in England.

Species	Min. sample	2-year (19–21)	10-year (10–20)	24-year (96–20)	LCL	UCL
Brown Hare	642	42 *	30 *	27 *	12	39
Rabbit	1201	-3	-43 *	-57 *	-65	-49
Grey Squirrel	729	20 *	37 *	39 *	26	54
Red Fox	228	17	-34 *	-46 *	-54	-35
Roe Deer	372	37 *	58 *	145 *	108	197
(Fallow Deer)	63	74	120 *	212 *	88	423
Reeves' Muntjac	116	23 *	86 *	238 *	141	391

Table 12 Mammal trends in Scotland.

Species	Min. sample	2-year (19–21)	10-year (10–20)	24-year (96–20)	LCL	UCL
Brown Hare	85	-14	1	-7	-32	24
Rabbit	114	-7	-34 *	-85 *	-91	-77
(Red Deer)	51	2	7	23	-31	116
Roe Deer	108	2	40 *	91 *	41	150

Table 13 Mammal trends in Wales.

Species	Min. sample	2-year (19–21)	10-year (10–20)	24-year (96–20)	LCL	UCL
Rabbit	95	22	-50 *	-43 *	-62	-15
Grey Squirrel	60	56 *	45 *	36	-1	78

Table 14 Mammal trends in Northern Ireland.

Species	Min. sample	2-year (19–21)	10-year (10–20)	24-year (96–20)	LCL	UCL
Mountain/Irish Hare	30	54	38	-	-	-
Rabbit	46	-14	12	-33	-61	21

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.

Table 15 Mammal trends in English Regions.

Species	North West		North East		Yorkshire & Humber		East Midlands		East of England		West Midlands		South East		South West		London	
	96–20	Sample	96–20	Sample	96–20	Sample	96–20	Sample	96–20	Sample	96–20	Sample	96–20	Sample	96–20	Sample	96–20	Sample
Brown Hare	-21	63	65 *	32	36	79	60 *	96	41 *	150	-21	42	-7	105	18	76	-	-
Rabbit	-62 *	106	-67 *	42	-23	122	-68 *	113	-60 *	208	-68 *	112	-66 *	300	-42 *	189	-	-
Grey Squirrel	117 *	61	-	-	4	37	87 *	50	36 *	106	13	78	29 *	222	57 *	114	51 *	52
Red Fox	-	-	-	-	-	-	-	-	-22	31	-	-	-25 *	65	-54 *	46	-	-
Roe Deer	-	-	-	-	307 *	37	-	-	247 *	31	-	-	113 *	131	73 *	110	-	-
Reeves' Muntjac	-	-	-	-	-	-	-	-	238 *	54	-	-	169 *	37	-	-	-	-

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



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.

By **Sarah Harris**, BBS (including WBBS) National Organiser, BTO

The WBBS trends are back! Following on from the difficulties faced in 2020 both with regards to COVID-19 restrictions and its impact on personal activities, the coverage 'bounce-back' witnessed in 2021 has allowed trend calculations once more.

Thank you to all the WBBS Regional Organisers and the 238 volunteers for making this possible! UK coverage totalled 273 stretches and a new

coverage record was set in Scotland with 62 stretches surveyed. In 2021, WBBS volunteers across the UK walked 1,678 km during active surveying. This is the equivalent of walking to Lisbon in Portugal, from BTO Thetford, Norfolk! This figure could easily double when considering the walk back to the start line after the survey is complete and the walk in to and out of sites!

A fantastic effort by all, and one that got the number of bird species recorded in 2021 to 163.

Table 16 The number of WBBS squares 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	-	168	132
1999	133	36	14	3	186	170
2000	129	32	14	1	176	159
2001*	38	12	1	-	51	49
2002	151	49	26	2	<u>228</u>	203
2003	178	<u>53</u>	<u>30</u>	1	262	236
2004	191	59	37	-	287	258
2005	<u>210</u>	52	39	-	301	269
2006	202	57	32	4	295	257
2007	190	48	32	-	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	185	<u>62</u>	23	3	273	238



▲ The latest Birds of Conservation Concern assessment, BoCC5, solely relied on the joined population trends generated by the Waterways Breeding Bird Survey and the Waterways Bird Survey (the WBBSs' predecessor survey) to update the conservation status of four species: Goosander, Common Sandpiper, Dipper and Grey Wagtail. See pages 8 and 34 for more.

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

INTERVIEW YOU

Here, we introduce you to Helen Baker who covered a WBBS stretch in Hertfordshire since the survey started in 1998, and now covers two sites in Devon. Below, we focus on Helen's experiences contributing to the WBBS:

1. What has been your best visit to the site and what is your favourite record to date?

Probably my best visit was to my Grand Union Canal site on a lovely morning in June 2010. I heard a commotion and saw the Little Owl in a bush just across the canal being mobbed by a gang of small birds!

My favourite record is an Otter in a water channel by the Exeter Ship Canal in April 2019.

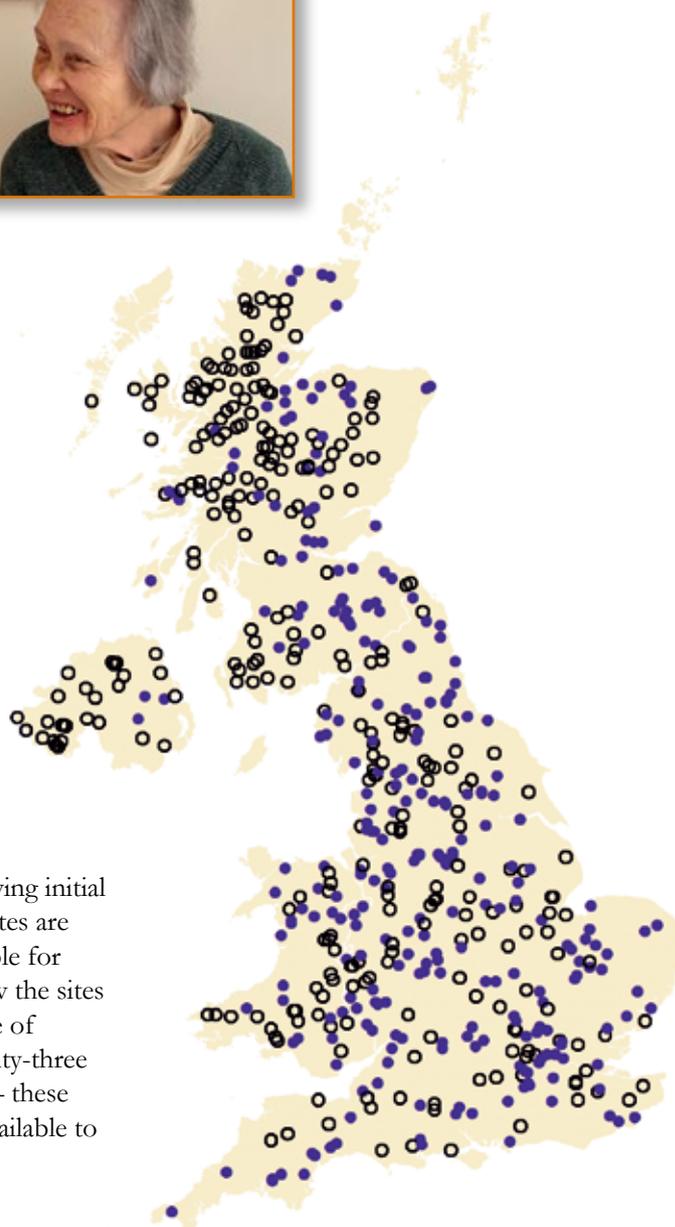
2. What would you most like to find on your survey?

I would love to record a Cuckoo on one of my Exeter Ship Canal sites.

3. And finally, what made you want to take part?

I started doing a Waterways Bird Survey in 1979 and continued with the WBBS when that replaced it. As I remember, I was keen to get involved in a long-term BTO survey and I still enjoy it.

www.bto.org/wbbs



COVERAGE

The Waterways Breeding Bird Survey started in 1998 and, following initial increases, coverage has remained fairly stable since 2004. New sites are not currently generated for this survey, but there are sites available for surveying across the UK. The ● dots on the map opposite show the sites surveyed in 2021, and the ○ circles show vacant sites at the time of writing (March 2022) to provide a 'snapshot' of availability. Eighty-three other sites are allocated but surveying in 2021 was not possible – these are not included on the map. There are currently no stretches available to survey on the Isle of Man or Channel Islands.

ADDITIONAL DATA IN WBBS

Detection Type recording, capturing information on how attention was first drawn to an individual or flock of birds, was first introduced in 2014 with the aim of helping to inform abundance estimates in research. In 2021, 193 sites (71%) had Detection Type records.

Mammal recording is an optional extra for the WBBS and was carried out on 238 stretches (87%). Species seen and counted included Red Deer through to the rarer records of American Mink. Mammal signs and local knowledge can also be recorded and species such as Pine Marten and European Beaver were recorded using signs only.

Colony recording took place on 18% of stretches surveyed.

ONLINE RECORDING

It is great to report that online data entry was carried out for 92% of visits but we do also welcome paper returns for those who do not use the BTO online data entry portals.

METHOD AND PURPOSE

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

The survey is especially valuable for monitoring the population trends of species strongly associated with linear waterways, as included in the trends on pages 34 and 35.

United Kingdom: WBBS population trends



The WBBS produces population trends for 28 species associated with waterways where the reporting threshold is met of being recorded on an average of 30 stretches or more since the survey began in 1998. Mandarin Duck is a new addition to the list, along with five-year trends (published online), for Gadwall, Little Egret and Cetti's Warbler. WBBS trends monitor the health of this habitat type specifically, rather than for all UK habitat types overall, as with the Breeding Bird Survey.

STATISTICALLY SIGNIFICANT RESULTS

Period	No. species	Greatest change in UK WBBS trends
Long-term (99–20) increases	1	Greylag Goose: 96%
Long-term (99–20) declines	12	Lapwing: -65%
Short-term (19–21) increases	3	Mandarin Duck: 67%
Short-term (19–21) declines	4	(Common Tern): -39%

The all-time, 10-year and two-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 28.

In addition to these results, data for other species, including mammals, are recorded during the WBBS visits and are available for research and analysis.

Some of the rarer species seen during the 2021 survey season include **Ptarmigan**, **Quail** and **Great White Egret** – the latter, a species that might be seen increasingly often during WBBS visits, as a recent UK colonist.

Some waterway-specialists are nearing the reporting threshold for trends and these include **Shelduck**, **Great-crested Grebe**, **Little Egret** and **Snipe**. A combination of increased coverage or changes to species distributions could make these trends a reality in the future.

CONSERVATION CONCERN

For four species, the combined Waterways Bird Survey (the predecessor to the WBBS) and WBBS trend provides the only information on population trends used in the BoCC5 assessment (see page 8).

Goosander is Green-listed owing to an increasing WBS-WBBS population trend. The BTO's two national surveys of sawbills demonstrated an average increase in population size of 3% per annum between 1987 and 1997, and the more recent *Bird Atlas 2007–11* showed considerable further range expansion since 1990.

Common Sandpiper is currently Amber-listed on the basis of moderate declines in the breeding population over 25 years, and in the longer-term. The WBS-WBBS trend is -49%, so very close to reaching the criteria (a 50% decline) for being Red-listed. It is also classed as a rare non-breeder because the UK non-breeding population is fewer than 900 individuals. The reasons for the decline are unclear, though poorer breeding success and reduced survival of first-year birds over the winter in West Africa have both been suggested as possible reasons.

Dipper is Amber-listed (moved from Green to Amber in BoCC4) on the basis of moderate declines in the longer-term (1975–2018) trend. The WBS-WBBS trend shows that **Dipper** populations have fluctuated over the last 30 years, with a general downward trend. Interestingly, breeding performance, measured through the Nest Record Scheme (www.bto.org/nrs) has improved strongly over time,

and laying dates have shifted earlier, perhaps because of climate change. Broods are now on average larger than in the late 1960s and 1970s, and there has been a substantial reduction in failure rates of nests at the egg stage, leading to sustained increase in the number of fledglings per breeding attempt. It is possible that some of the UK fluctuations may relate to unfavourable winter weather.

The status of **Grey Wagtail** has improved and consequently it has moved from the Red List to the Amber List, and is Amber-listed on the basis of moderate declines in the long-term WBS-WBBS (1975–2018) trend. The WBS-WBBS trend shows a fluctuating population size along waterways, with a fall during the late 1970s and early 1980s from an initial high point in 1974, some increase since the late 1990s, and another steep drop around 2010. Clutch and brood size of **Grey Wagtail** rose as the population fell, but are now getting smaller again. Nest failure rates have dropped substantially, and there has been a linear increase in the number of fledglings per breeding attempt, suggesting that reduced survival is the likely driver of decline.

SUMMARY

Species trend possibilities are increasing for the WBBS and this could prove crucial when assessing the health of UK waterways. Of the 13 statistically significant long-term, 21-year, population trends produced using WBBS data, 12 indicate long-term declines and one shows an increase.



▲ **Mandarin Duck** now meets the five- and 10-year reporting threshold, with increases of 49% and 102% respectively and these are statistically significant trends. In addition, it is also possible to report five-year trends (published online) for **Gadwall** (a decrease of 15%), **Little Egret** (an increase of 60%) and **Cetti's Warbler** (an increase of 65%). The trends for **Little Egret** and **Cetti's Warbler** are statistically significant. This brings the total species reported by the WBBS to 28, three of which are reported online only.

Table 17 UK population trends during 2019–21, 2010–20 and 1999–2020.

Species	Min. sample	2-year (19–21)	10-year (10–20)	21-year (99–20)	LCL	UCL
Canada Goose	99	27 *	-23	65	-19	214
Greylag Goose	56	0	13	96 *	23	235
Mute Swan	109	20	-9	-4	-28	24
Mandarin Duck	39	67 *	102 *	–	–	–
Mallard	229	-1	-15 *	-7	-19	8
Tufted Duck	42	14	-53 *	-59 *	-77	-4
Goosander	54	21	19	24	-21	62
Moorhen	143	-10	-8	-23 *	-35	-7
Coot	67	-18 *	-44 *	-43 *	-65	-10
Oystercatcher	75	11	-25 *	-45 *	-57	-27
Lapwing	73	1	-35 *	-65 *	-77	-49
Curlew	59	-23	-15	-60 *	-74	-41
Common Sandpiper	66	-6	-20 *	-37 *	-49	-22

Species	Min. sample	2-year (19–21)	10-year (10–20)	21-year (99–20)	LCL	UCL
(Common Tern)	30	-39 *	-43 *	-54 *	-68	-29
(Cormorant)	68	-33 *	21	2	-24	36
(Grey Heron)	170	-3	-13 *	-32 *	-42	-22
Kingfisher	68	-18	-13	-24	-44	3
Sand Martin	74	-4	22	47	-9	118
Sedge Warbler	88	26	-37 *	-55 *	-66	-39
Reed Warbler	56	6	-3	-11	-29	21
Whitethroat	126	-18 *	-20 *	0	-18	19
Dipper	88	4	-8	-23 *	-45	-1
Grey Wagtail	126	38 *	8	-14	-29	10
Pied Wagtail	149	20	-16 *	-43 *	-56	-29
Reed Bunting	109	6	-14	-6	-22	16

INTERPRETING THE RESULTS: see page 15

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

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 2021:

ENGLAND

Huntingdon & Peterborough
Staffordshire (North, South, West)

Derek Langslow (now **VACANT**)
VACANT

NORTHERN IRELAND

Antrim & Belfast, Armagh, Down,
Londonderry and Tyrone

Michael Stinson

WALES

Pembrokeshire

Bob Haycock

Many thanks are due to Derek Langslow for his efforts coordinating the WBBS in Huntingdon and Peterborough and who has now retired from the role. We currently have vacancies for WBBS Regional Organisers in Angus, Cambridge, Carmarthen, Derbyshire (North & South), Devon, Essex (South), Huntingdon & Peterborough, Lancashire (South), Merseyside, Montgomery, Lincolnshire (South), Merseyside, Nottinghamshire, Radnorshire, Staffordshire (North, South & West), Yorkshire (Leeds & Wakefield) and Yorkshire (North-West).

In addition to the Regional Organisers, thanks go out to all the volunteers and landowners who enable this survey to be the success it is. Thank you all.

SPECIAL THANKS

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

BBS Regional Organisers in 2021:

ENGLAND

Avon
Bedfordshire
Berkshire
Birmingham & West Midlands
Buckinghamshire
Cambridgeshire
Cheshire (Mid)
Cheshire (North-East and South)
Cleveland
Cornwall
Cumbria
Derbyshire (North, South)
Devon
Dorset
Durham
Essex (North-East)
Essex (North-West)
Essex (South)
Gloucestershire
Hampshire
Herefordshire
Hertfordshire
Huntingdon & Peterborough
Isle of Wight
Isles of Scilly
Kent
Lancashire (East)
Lancashire (North-West)
Lancashire (South)
Leicestershire & Rutland
Lincolnshire (East)
Lincolnshire (North)
Lincolnshire (South)
Lincolnshire (West)
London (North)
London (South)
Manchester
Merseyside
Norfolk (North-East)
Norfolk (North-West)
Norfolk (South-East)
Norfolk (South-West)
Northamptonshire
Northumberland
Nottinghamshire
Oxfordshire (North)
Oxfordshire (South)
Shropshire
Somerset
Staffordshire (North, South, West)
Suffolk
Surrey
Sussex
The Wirral
Warwickshire
Wiltshire (North, South)
Worcestershire
Yorkshire (Bradford)
Yorkshire (Central)
Yorkshire (East, Hull)
Yorkshire (Leeds & Wakefield)
Yorkshire (North-East)
Yorkshire (North-West)
Yorkshire (Richmond)
Yorkshire (South-East)
Yorkshire (South-West)
Yorkshire (York)

Dave Stoddard
Judith Knight
Sean Murphy
Steve Davies
Phil Tizzard
Rob Pople (now **VACANT**)
Paul Miller
Hugh Pulsford
Michael Leakey
Michael Williams
Colin Gay
Dave Budworth (now **VACANT**)
Stella Beavan (now **VACANT**)
Jack Winsper
David Sowerbutts
Rod Bleach
Graham Smith
VACANT
Gordon Kirk
Glynne Evans
Chris Robinson
Martin Ketcher
Mick Twinn
Jim Baldwin
Will Wagstaff
Bob Knight
VACANT (now Bernard Bracken)
Jean Roberts
Stephen Dunstan (now **VACANT**)
Dave Wright
Phil Espin
Chris Gunn
Jo Hubbard
Mike Daly
Sabrina Schalz
Richard Arnold
Nick Hilton
VACANT
Chris Hudson
Jonathan Martin
Rachel Warren
Vince Matthews
Barrie Galpin
Muriel Cadwallender
VACANT
Frances Buckel
John Melling
Jonathan Groom
Eve Tigwell
Gerald Gittens
Mick Wright
Penny Williams
Helen Crabtree
Paul Miller
Annette Jarratt-Knock
Polly Marino
Steve Davies
Mike Denton
Mike Brown
Brian Walker
Rachael Dixey (now **VACANT**)
Nicholas Gibbons
VACANT
Mike Gibson
VACANT (temporarily Grant Bigg)
Grant Bigg
Rob Chapman

SCOTLAND

Aberdeen
Angus
Argyll (Mull, Coll, Tiree & Morven)
Argyll (mainland & Gigha) & Bute
Arran
Ayrshire
Benbecula & The Uists
Borders
Caithness
Central
Dumfries
Fife & Kinross
Inverness (East & Speyside, West)
Islay, Jura & Colonsay
Kincardine & Deeside
Kirkcudbright

Moray Souter
VACANT (temporarily Steve Willis)
Ewan Miles
Nigel Scriven
James Cassels
Dave McGarvie
Yvonne Benting
Neil Stratton
Donald Omand
Neil Bielby
Andy Riches
Paul Blackburn
Hugh Insley
David Wood
Claire Marsden
Andrew Bielinski

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

Gordon Brady
Craig Ferries
Stephen Metcalfe
Melvin Morrison
Colin Corse
Mike Bell
Bob Swann
Simon Cohen
Dave Okill
Carol Hawley
Bob Swann
VACANT (temporarily 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
Paul Aubery (now **VACANT**)
Anne Brenchley
Mel ab Owain
Wayne Morris
Lyndon Jeffery
Richard Clarke
Dave Anning
Jane Kelsall (now **VACANT**)
Annie Haycock
Carlton Parry

NORTHERN IRELAND

Antrim & Belfast
Armagh
Down
Fermanagh
Londonderry
Tyron

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: Stella Beavan (Devon), Dave Budworth (Derbyshire North and South) who sadly passed away in early 2022 after many years coordinating the BBS and WBBS locally, Rachael Dixey (Yorkshire Leeds & Wakefield), Stephen Dunstan (Lancashire South), Jane Kelsall (Montgomery) and Rob Pople (Cambridgeshire).

We would like to thank and welcome Bernard Bracken (Lancashire East) to the BBS and WBBS Regional Organiser team.

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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BTO Research Report 745
ISSN 1368-9932
ISBN 978-1-912642-37-3

