

The Breeding Bird Survey 2002

Report Number 8



by

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Published by

British Trust for Ornithology, Joint Nature Conservation Committee and
Royal Society for the Protection of Birds,
August 2003

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Royal Society for the Protection of Birds, 2003



BTO Research Report Number 334
ISSN 1368-9932
ISBN 1-902576-74-8

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The eighth annual report for the Breeding Bird Survey (BBS) allows us to look at the progress of the scheme over the past eight years, 1994-2002. We have also detailed the changes from the most recent years, 2000-2002. Data for 2001 have not been included in the long-term trends because in that year access restrictions imposed by the outbreak of Foot & Mouth Disease caused sampling bias. Data were collected from 2,136 squares representing a massive effort from our volunteer fieldworkers and Regional Organisers (ROs). We would like to take this opportunity to thank everyone who has contributed to the success of the BBS.

The BBS is organised by the British Trust for Ornithology (BTO), and jointly funded by BTO, the Joint Nature Conservation Committee (JNCC, on behalf of English Nature, Scottish Natural Heritage, Countryside Council for Wales and the Environment and Heritage Service in Northern Ireland) and the Royal Society for the Protection of Birds (RSPB). The BBS Steering Group comprises Dr Helen Baker (JNCC), Dr Richard Gregory (RSPB), Dr Stephen Baillie (BTO) and Dr David Noble (BTO).

We are grateful to the following people who have provided assistance to the scheme since its inception: Dr Nicholas Aebischer, Dr Mark Avery, Dr Ian Bainbridge, Richard Bashford, George Boobyer, Prof. Steve Buckland, the late Dr Steve Carter, Dr Humphrey Crick, Anita Donaghy, Dr Colin Galbraith, Dr David Gibbons, Dr John Goss-Custard, Dr Rhys Green, Prof. Jeremy Greenwood, Dr Richard Gregory, John Marchant, Mike Meharg, Dr Dorian Moss, Dr Will Peach, Dr Ken Perry, Angela Rickard, Dr Ken Smith, David Stroud, Dr Derek Thomas and Richard Weyl.

Maps of coverage were produced using DMAP which was written by Dr Alan Morton. The cover photograph is by Tommy Holden and the BBS logo is by Andy Wilson. Report production and design are by Angela Rickard.

This report is provided free to all BBS fieldworkers and Regional Organisers. Further copies are available from BTO HQ at a cost of £5 incl. p&p.

PROFILES

Mike Raven is the National Organiser for the BBS and is responsible for the day-to-day running of the scheme, which involves liaison with BTO Regional Organisers and volunteers, promotion of the scheme and providing feedback by giving presentations around the country. Mike was previously responsible for the running of the BTO's Nest Record Scheme.

Dr David Noble is the Head of the Census Unit and oversees the running of bird surveys such as the WBS, WBBS and the BBS, as well as associated research on bird populations. Before joining the BTO he worked at Cambridge University on the relationships between cuckoos and their hosts, in the UK and in Africa.

Citation: Raven, M.J., Noble, D.G., & Baillie, S.R. (2003).

The Breeding Bird Survey 2002. BTO Research Report 334. British Trust for Ornithology, Thetford.

The Breeding Bird Survey 2002

Summary

- This is the eighth annual report of the BTO/JNCC/RSPB Breeding Bird Survey (BBS), covering the years 1994 to 2002. Data for 2001 have not been recorded in the long-term trends because of sampling bias caused by the access restrictions imposed by the outbreak of Foot & Mouth Disease. The primary aim of the survey is to provide population trends for a range of common and widespread birds in the UK.
- Survey plots are based on 1 x 1 km squares of the National Grid. Squares are chosen on the basis of a stratified, random sampling design, with larger numbers of squares selected in regions with more potential volunteers. The aim is to survey the same squares each year.
- Volunteer observers visit their squares three times a year. The first visit is used to establish a transect route and to record details of land use and habitat type. The second and third are early morning counts to survey breeding birds. A line transect method is used, with birds recorded in distance bands. Each survey requires about five hours' fieldwork per year, enabling a large number of people to become involved across the UK.
- The scheme is administered centrally by BTO headquarters staff and organised by voluntary BTO Regional Organisers, who in most cases are BTO Regional Representatives, with help from the Welsh and Irish Officers and BTO Scotland. ROs play a vital role in coordinating and fostering local fieldwork effort.
- A total of 212 species and subspecies was recorded in 2002. Population indices are calculated using methods that take regional differences in sampling effort into account. Across the UK, we were able to measure population changes with a medium to high degree of precision for 105 species (Table 4).
- In the UK, 29 species declined and 52 species increased significantly between 1994 and 2002, with only Wood Warbler and Willow Tit decreasing by more than 50%. Shelduck, Kestrel, Golden Plover, Common Sandpiper, Cuckoo, Tawny Owl, Swift, Lesser Whitethroat, Spotted Flycatcher, Hooded Crow, Bullfinch and Corn Bunting all recorded moderate declines (25-50%) and on a more positive note, Greylag Goose, Buzzard, Coot, Snipe, Kingfisher, Great Spotted Woodpecker, Grey Wagtail, Stonechat, Goldcrest, Raven and Tree Sparrow all recorded increases in excess of 50%.
- 16 widespread species have been Red-listed on the basis of long-term population trends (see Gregory *et al* 2002) and of these, 10 species have declined significantly on BBS squares between 1994 and 2002 (Grey Partridge, Turtle Dove, Skylark, Spotted Flycatcher, Willow Tit, Starling, House Sparrow, Bullfinch, Yellowhammer and Corn Bunting) and three species have increased significantly (Song Thrush, Marsh Tit and Tree Sparrow).
- Population changes are provided for all four constituent UK countries – Scotland, England, Wales and Northern Ireland and for each of the nine English Government Office Regions.
- In England, 27 species declined and 43 species increased significantly between 1994 and 2002. Willow Tit declined by more than 50%, and Grey Partridge, Turtle Dove, Cuckoo, Swift, Tree Pipit, Lesser Whitethroat, Willow Warbler, Spotted Flycatcher, Bullfinch and Corn Bunting showed moderate declines (25-50%). Increases greater than 50% were recorded for Little Grebe, Greylag Goose, Canada Goose, Buzzard, Coot, Common Tern, Great Spotted Woodpecker, Grey Wagtail, Redstart, Stonechat and Raven (Table 5).
- In Scotland, 10 species declined and 16 species increased significantly between 1994 and 2002. Swift and Hooded Crow declined by over 50% and Kestrel, Golden Plover, Lapwing and Curlew showed moderate declines (25-50%). Increases greater than 50% were recorded for Grey Heron, Mallard, Buzzard, Snipe, House Martin, Sedge Warbler, Goldcrest, Raven and Goldfinch (Table 6).
- In Wales, eight species declined and 17 species increased significantly between 1994 and 2002. No species were recorded as declining by over 50%, but Cuckoo, Swift, Garden Warbler, Willow Warbler, Starling, Bullfinch and Yellowhammer all showed moderate declines (25-50%). Increases greater than 50% were recorded for Great Spotted Woodpecker, House Martin, Blackcap, Nuthatch, Treecreeper, House Sparrow and Goldfinch (Table 7).
- In Northern Ireland, no species were recorded as declining significantly whereas between 1994 and 2002, 12 species increased. Increases greater than 50% were recorded for Wren, Dunnock, Blackbird, Coal Tit, Great Tit, Rook, Hooded Crow and Chaffinch (Table 8).
- In England, a number of species, including several farmland specialists, showed declines in most of the regions for which population trends could be produced, including Kestrel, Grey Partridge, Curlew, Turtle Dove, Cuckoo, Swift, Skylark, Lesser Whitethroat, Bullfinch, Yellowhammer and Corn Bunting. Species that showed marked regional differences in population trends included Stock Dove, Cuckoo, Swallow, House Martin, Meadow Pipit, Song Thrush, Mistle Thrush, Garden Warbler, Willow Warbler, Jay, Hooded Crow, Rook, Starling, House Sparrow, Chaffinch and Linnet. There were no consistent patterns among these species.

Breeding Bird Survey

Background

The status of wild bird populations is an important indicator of the health of the countryside that has received great interest from in recent years. In 1994, after two years pilot work, the BTO/JNCC/RSPB Breeding Bird Survey (BBS) was launched, with the aim of improving the geographical scope of UK bird monitoring by including all habitats and, therefore, more species of breeding birds. Since the final year of the Common Birds Census in 2000, the BBS has become the primary scheme for monitoring the population changes of our common and widespread bird species in the UK. By surveying more than 2,000 sites each year, we are able to routinely generate UK population trends for more than 100 species and BBS results are being increasingly used to set conservation priorities by the Government and non-Governmental organisations.

Methods and organisation

The BBS uses a line-transect method in randomly selected 1 x 1 km squares. Each surveyor visits their plot twice within the breeding season, undertaking two 1 km transects across their square and recording all birds seen or heard. Birds are recorded in one of three distance bands, or in flight, the former to enable species density to be calculated and detectability to be assessed. A separate visit is required to record the habitat. Through its careful design, the BBS is able to provide precise population trends for a large proportion of our breeding species. Data from the BBS can also be summarised for individual countries, counties and habitats.

Population changes are estimated using a log-linear model with Poisson error terms. For these analyses, we use the higher count – from the two visits – for each species, summed over all distance categories and transect sections. Counts are modelled as a function of year and site effects, corrected for over-dispersion, and weighted to account for differences in sampling density among regions of the UK. Only squares that were counted in at least two years are included in the analyses. Counts for six species of wader (Oystercatcher, Lapwing, Golden Plover, Curlew, Redshank and Snipe) have been corrected to exclude counts of non-breeding flocks and, for Golden Plover, observations in unsuitable breeding habitat have also been excluded. Current work is underway to assess the precision and reliability of BBS trends for all species. The aim is to develop a protocol for restricting the reporting of trends to those based on reliable data and sufficient sample sizes. This may for example mean the exclusion of some gull species in future BBS reports. For a more detailed account of the survey design and methodology, please refer to BBS Report No. 4 (available from BTO HQ).

The BBS National Organiser based at BTO HQ is responsible for the overall running of the scheme and acts as the main point of contact for the network of voluntary Regional Organisers (ROs). Each RO is responsible for allocating squares to volunteers in their particular region and for finding additional volunteers should existing ones drop out. They also ensure that survey forms are collected for each region and sent to BTO HQ as soon after the field season as possible. Since the success of the survey depends on volunteer surveyors throughout the UK, up-to-date feedback is vital. All forms are acknowledged by BTO HQ on receipt, and the Census Unit newsletter *Census News* and a copy of the annual report are sent to all BBS surveyors.

Survey coverage

To date we have received 2,136 sets of BBS forms for 2002, a small decrease from the 2,252 received for 2000 (Table 1), but a very large improvement on the 600 sets of forms received for 2001. Much of the decrease in coverage between 2000 and 2002 can be put down to the 'year out' in 2001, when the majority of observers were unable to complete their survey due to access restrictions imposed by the outbreak of Foot & Mouth Disease. However, many parts of the country continued to receive optimum levels of coverage in 2002, and promotion to expand the scheme will be targeted to areas with continuing low coverage.

A total of 3,836 squares were allocated to Regional Organisers across the UK in 2002. Only those squares that have been surveyed in two or more years between 1994 and 2002 are included in the results, resulting in bird counts from 2,922 sites being included in this report's analysis. BBS squares are randomly selected by computer, some being generated on islands in the middle of remote Scottish lochs, airport runways and the middle of the M25! Clearly some of these can never be surveyed and truly 'uncoverable' squares are removed from the system. However, squares that are temporarily inaccessible or simply remote are kept in the system in order to maintain the integrity of the sampling design, although we recognise that some will seldom be surveyed.

England

Overall, the number of squares surveyed in England fell by 7% between 2000 and 2002, although excellent coverage was achieved in many areas, particularly in the North East. Other areas relatively unchanged included Yorkshire, the East of England, the South East, the South West and London. ROs in a number of BTO regions in England excelled themselves again,

Table 1. A comparison of BBS coverage in 2000 and 2002, broken down by country and English Government Office Regions.

Country or Region	2000 covered	2002 covered	2002 as % of 2000
England	1,700	1,577	93%
Scotland	246	231	94%
Wales	216	221	102%
Northern Ireland	83	97	117%
Isle of Man	3	3	100%
Channel Isles	7	7	100%
North West England	196	179	91%
North East England	54	56	104%
Yorkshire & the Humber	137	132	96%
East Midlands	148	124	84%
East of England	257	251	98%
West Midlands	168	136	81%
South East England	385	365	95%
South West England	293	275	94%
London	62	59	95%
Total (numbers of squares):	2,255	2,136	95%

with especially good levels of coverage achieved in Avon, Cheshire (North & East), Cheshire (South), Devon, Dorset, Greater Manchester, Gloucestershire, Hampshire, Hertfordshire, Kent, Lancashire (South), London, Northumberland, Nottinghamshire, Oxfordshire (South), Shropshire, Suffolk, Surrey, Worcestershire, and the Yorkshire regions of Bradford and York, to name but a few.

Scotland

Overall, the number of squares surveyed in Scotland fell by 6% between 2000 and 2002. However, many of the ROs in Scotland are working in arguably the most difficult conditions in the UK, in terms of remoteness and the small number of potential volunteers available. In fact, taking the human populations of the two countries into consideration, a higher proportion of volunteers have been recruited in Scotland than in England. Coverage in several areas, including Central Region, Dumfriesshire, Fife, Inverness (East), Lothian, Orkney and Ross-shire, remained good. Coverage in some of the remotest parts of the country also improved, particularly in Caithness and Sutherland. The ongoing task of finding ROs for each Scottish region continues, with recent recruitments in Sutherland and Lanarkshire.

Wales

In contrast to England and Scotland, BBS coverage in Wales increased by 2% between 2000 and 2002. Good or improved coverage was achieved in several parts of the country, including Breconshire, Carmarthenshire, Pembrokeshire, Clwyd (East), Clwyd (West) and Montgomeryshire. Large numbers of BBS squares were also surveyed in the most populous part of the country, Gwent and Glamorgan. This continued good coverage will help to improve the reliability of results in Wales and will hopefully enable us to monitor a wider range of species in the future.

Northern Ireland

A record number of 97 BBS squares were surveyed in Northern Ireland in 2002. This would not have been achieved without the generous financial support of the Environment and Heritage Service in Northern Ireland who funded two professional fieldworkers to cover 39 squares, and the help of the RSPB office in Belfast who organised the fieldwork. Volunteer coverage also held its own and next year we must surely pass the '100 squares' mark in the Province.

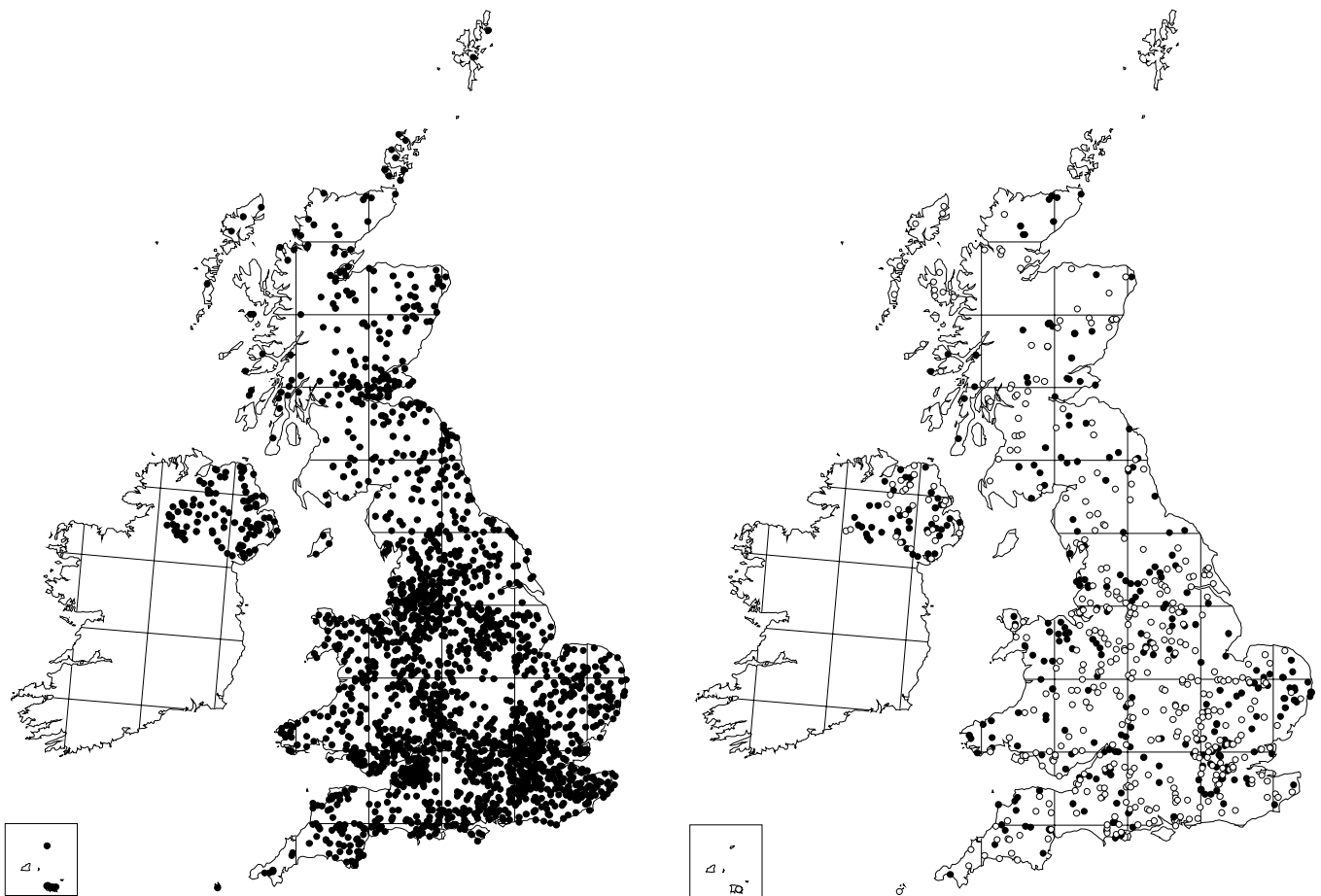


Figure 1. The left-hand map shows the distribution of BBS squares covered in 2002 and the right-hand map shows the distribution of squares covered in 2000 but not in 2002 (open symbols) and squares covered in 2002 but not in 2000 (shaded symbols).

6 Survey results

Species recorded

A total of 212 species was recorded on BBS visits in the UK in 2002, a little down on the total of 215 species in 2000, but still including the vast majority of bird species that regularly breed in the country. Of these, 100 species were recorded in 50 or more squares (Table 2) and a further 112 species in less than 50 squares (Table 3).

A number of previously scarce breeding species continue to be recorded in increasing numbers, including Little Egret, Marsh Harrier, Hobby and Red Kite. It is only a matter of time before the latter two species are recorded in enough BBS squares for population indices to be produced. A number of late winter visitors or spring migrants were also recorded on BBS visits, including Great Northern Diver, Whooper Swan, White-fronted Goose, Pink-footed Goose, Brent Goose, Grey Plover, Sanderling, Bar-tailed Godwit, Turnstone, Redwing, Fieldfare and Brambling.

As in 2000 and 2001, the Wood Pigeon was both the most widespread species (occurring in 92% of squares surveyed) and also the most abundant species (42,401 birds counted) in 2002. Closely following the Wood Pigeon in their ubiquity were Wren, Blackbird and Chaffinch, all being recorded in 91% of squares surveyed, while Starling (35,030 birds) and Rook (26,490 birds) were the next most abundant species.

The top square in terms of number of species was in Berkshire, along the Kennet valley, with an impressive total of 60. This was closely followed by 59 species in squares in Oxfordshire and Kent. At the other end of the spectrum, only two or three species were recorded in some upland squares in the Highlands of Scotland. Due credit must be given to those observers who survey these remote but nevertheless important areas because, although relatively few species occur, they represent a large proportion of the country and hold the bulk of the population of some open-country species. At a county level, 35 species were recorded on average in squares in the southern counties of Bedfordshire and Berkshire, while an average of only 18 species was found in squares in the Highland Region of Scotland.

United Kingdom

Of the 105 species that were recorded on an average of 40 or more squares in the UK between 1994 and 2002 (Table 4), 29 species declined significantly and 52 species increased significantly between 1994 and 2002. Trends for all species discussed in this section are for the period 1994-2002 unless otherwise stated.

Of 16 species Red-listed in *Population Status of Birds in the UK*, because their UK breeding populations had declined by at least 50% during 1974-99 and for which we are able to produce population trends, ten declined significantly and three increased

Table 2. Species recorded in 50 or more squares across the UK during the 2002 BBS survey. 'Number of squares' is the number of squares a species was recorded in and '%' the percentage of squares that the species occurred in. 'Species' in parenthesis are usually recognised as races or forms rather than full species.

Species	Number of squares	%	Species	Number of squares	%	Species	Number of squares	%
Little Grebe	64	3%	Collared Dove	1069	50%	Blackcap	1223	57%
Great Crested Grebe	59	3%	Turtle Dove	154	7%	Chiffchaff	1101	52%
Cormorant	196	9%	Cuckoo	573	27%	Willow Warbler	1066	50%
Grey Heron	584	27%	Little Owl	83	4%	Goldcrest	634	30%
Mute Swan	191	9%	Tawny Owl	74	3%	Spotted Flycatcher	154	7%
Greylag Goose	118	6%	Swift	849	40%	Long-tailed Tit	667	31%
Canada Goose	390	18%	Kingfisher	53	2%	Marsh Tit	134	6%
Shelduck	116	5%	Green Woodpecker	625	29%	Coal Tit	678	32%
Mallard	1036	49%	Great Spotted Woodpecker	736	34%	Blue Tit	1820	85%
Tufted Duck	122	6%	Skylark	1349	63%	Great Tit	1685	79%
Sparrowhawk	269	13%	Sand Martin	100	5%	Nuthatch	378	18%
Buzzard	663	31%	Swallow	1522	71%	Treecreeper	266	12%
Kestrel	484	23%	House Martin	762	36%	Jay	610	29%
Red Grouse	91	4%	Tree Pipit	101	5%	Magpie	1521	71%
Red-legged Partridge	399	19%	Meadow Pipit	630	29%	Jackdaw	1289	60%
Grey Partridge	189	9%	Yellow Wagtail	142	7%	Rook	1049	49%
Pheasant	1362	64%	Grey Wagtail	208	10%	Carrion Crow	1824	85%
Moorhen	544	25%	Pied Wagtail	1045	49%	Hooded Crow	122	6%
Coot	209	10%	Wren	1953	91%	Raven	203	10%
Oystercatcher	243	11%	Dunnock	1621	76%	Starling	1515	71%
Golden Plover	65	3%	Robin	1878	88%	House Sparrow	1284	60%
Lapwing	539	25%	Redstart	137	6%	Tree Sparrow	122	6%
Snipe	124	6%	Whinchat	62	3%	Chaffinch	1941	91%
Curlew	428	20%	Stonechat	117	5%	Greenfinch	1466	69%
Redshank	71	3%	Wheatear	253	12%	Goldfinch	1188	56%
Black-headed Gull	425	20%	Blackbird	1949	91%	Siskin	117	5%
Common Gull	105	5%	Song Thrush	1585	74%	Linnets	1032	48%
Lesser Black-backed Gull	496	23%	Mistle Thrush	1022	48%	Lesser Redpoll	132	6%
Herring Gull	523	24%	Grasshopper Warbler	51	2%	Bullfinch	440	21%
Great Black-backed Gull	83	4%	Sedge Warbler	257	12%	Yellowhammer	944	44%
Common Tern	55	3%	Reed Warbler	95	4%	Reed Bunting	336	16%
Feral Pigeon	552	26%	Lesser Whitethroat	208	10%	Corn Bunting	111	5%
Stock Dove	618	29%	Whitethroat	1052	49%			
Wood Pigeon	1959	92%	Garden Warbler	337	16%			

Table 3. Species recorded on fewer than 50 squares for the whole of the UK during the 2002 survey. Species marked with an asterisk are feral or non-native species on Category E of the British Ornithologists' Union British List. Species in parenthesis are usually recognized as races or forms rather than full species.

Species	Number of squares	Species	Number of squares	Species	Number of squares	Species	Number of squares
Red-throated Diver	13	Pochard	9	Ringed Plover	20	Barn Owl	20
Black-throated Diver	3	Eider	10	Dotterel	2	Long-eared Owl	3
Great Northern Diver	1	Goldeneye	6	Grey Plover	2	Short-eared Owl	14
Black-necked Grebe	1	Red-breasted Merganser	10	Sanderling	1	Nightjar	1
Fulmar	26	Goosander	32	Dunlin	18	Hoopoe	1
Manx Shearwater	1	Ruddy Duck	10	Ruff	1	Lesser Spotted Woodpecker	16
Gannet	9	Red Kite	36	Woodcock	7	Woodlark	12
Shag	4	White-tailed Eagle	2	Black-tailed Godwit	4	Rock Pipit	15
Little Egret	9	Marsh Harrier	21	Bar-tailed Godwit	1	Dipper	33
Black Swan*	5	Hen Harrier	7	Whimbrel	25	Nightingale	29
Whooper Swan	1	Montagu's Harrier	1	Greenshank	6	Black Redstart	1
Pink-footed Goose	6	Goshawk	11	Green Sandpiper	4	Ring Ouzel	21
White-fronted Goose	2	Golden Eagle	4	Common Sandpiper	49	Fieldfare	28
Snow Goose	1	Osprey	8	Turnstone	4	Redwing	10
Bar-headed Goose*	2	Merlin	17	Red-necked Phalarope	1	Cetti's Warbler	12
(Domestic Goose*)	4	Hobby	38	Arctic Skua	8	Dartford Warbler	3
Barnacle Goose	2	Peregrine	30	Great Skua	8	Wood Warbler	47
Brent Goose	4	Ptarmigan	2	Mediterranean Gull	5	Pied Flycatcher	43
Egyptian Goose	5	Black Grouse	8	(Yellow-legged Gull)	1	Bearded Tit	1
Wood Duck*	1	Quail	10	Kittiwake	1	Willow Tit	31
Mandarin	19	Lady Amherst's Pheasant	1	Sandwich Tern	14	Crested Tit	1
Muscovy Duck*	2	Reeves's Pheasant*	1	Arctic Tern	8	Short-toed Treecreeper	4
(Domestic Mallard*)	8	Peacock*	4	Little Tern	2	Chough	6
Wigeon	4	Water Rail	4	Guillemot	2	Brambling	1
Gadwall	20	Corncrake	1	Black Guillemot	2	Twite	11
Teal	19	Avocet	3	Rock Dove	12	Crossbill	32
Shoveler	9	Stone-curlew	4	Ring-necked Parakeet	27	Scottish Crossbill	1
Red-crested Pochard	2	Little Ringed Plover	7	Cockatiel*	1	Cirl Bunting	2

significantly. Those in decline include the familiar farmland specialists such as Skylark (down 14%), Grey Partridge (down 18%), Corn Bunting (down 41%) and the recently Red-listed Yellowhammer (down 13%). Only the decline in Grey Partridge has lessened since the last full set of BBS results were produced for the 1994-2000 period.

The declines of two Red-listed, typically urban species, the House Sparrow and Starling, continued to show significant downward trends. Increasing concern about the status of some of our woodland species was highlighted by the significant decline in Spotted Flycatcher, whose numbers fell by 42%. However, it was another woodland species, the Willow Tit (down 72%) that showed the greatest decline for any species monitored by the BBS between 1994 and 2002. In fact, the once almost extinct Red Kite was recorded on more squares in the UK than the Willow Tit in 2002. On a brighter note, three species showed a reversal in the long-term downward trends since the 1970s, with Song Thrush numbers up by 13%, Marsh Tit up by 34% and Tree Sparrow up by 55% since 1994.

A total of 34 species for which we are able to generate population trends are Amber-listed in *Population Status of Birds in the UK*. These species are Amber-listed on the basis of one or more criteria, including declines in breeding numbers; declines in breeding range, the UK breeding population forms a large proportion of the European total, or the species has an unfavourable status in Europe. Fourteen species are Amber-listed on the basis of moderate (25-49%) declines in the UK during 1974-99, of which three increased significantly and seven decreased significantly between 1994 and 2002. Of these, two predominantly woodland species (Willow Warbler and Wood Warbler), two farmland species (Kestrel and Lapwing) and a habitat generalist (Cuckoo) all declined significantly. House

Martin, Grey Wagtail and Dunnock all showed a short-term significant increase in numbers.

An additional six species are Amber-listed on the basis that their UK breeding populations form at least 20% of the European populations and of these, Oystercatcher and Curlew declined significantly and Mute Swan and Stock Dove increased significantly between 1994 and 2002. A further seven species are Amber-listed partly because of their unfavourable status in Europe (A Species of European Concern) and of these, only the Redshank declined significantly, whilst Kingfisher, Green Woodpecker, Swallow, Redstart and Stonechat increased in the short-term.

Most Green List species (those with no evidence of long-term decline) continued to fare well, particularly a suite of typical woodland and garden species (Wren, Blackcap, Chiffchaff, Robin, Blue Tit, Great Tit, Coal Tit, Nuthatch, Treecreeper and Jay). Two woodland species declined significantly however, with Tawny Owl numbers down by 35% and Garden Warbler down by 26%. Two wader species also declined significantly, with Common Sandpiper numbers down by 25% and Golden Plover down by 26%.

England

A total of 190 species were recorded on BBS visits in England in 2002 and of these, the Wood Pigeon was the most widespread, being recorded on 97% of squares, closely followed by Blackbird (96%) and Wren (95%). Of the 99 species that were recorded on an average of 30 or more squares in England (Table 5), 27 species had declined significantly and 43 species had increased significantly between 1994 and 2002.

Of BBS squares surveyed in the UK in 2002, 74% lay in England and consequently many of the results for England are similar to those for the UK overall. However, the population trends for

Table 4. UK population changes for species recorded on a mean of 40 or more squares per year for 2000-2002 and 1994-2002 (excluding squares where the species was recorded in only one year). The figures presented are the percentage changes in population levels for the respective time periods, marked with an asterisk where significant. For the 1994-2002 period, the lower and upper 95% confidence limits are given. Species in bold are Red-listed, and species in italics Amber-listed in *Population Status of Birds in the UK*.

Species	Sample	Change		lcl	ucl	Species	Sample	Change		lcl	ucl
		00-02	94-02					00-02	94-02		
Little Grebe	47	19	47 *	5	106	Dipper	44	-32	-25	-51	15
Great Crested Grebe	55	-5	23	-7	63	Wren	1784	-8 *	14 *	10	18
<i>Cormorant</i>	147	27	50 *	26	78	<i>Dunnock</i>	1483	4	13 *	7	18
Grey Heron	477	10	32 *	18	46	Robin	1721	-3	16 *	12	20
<i>Mute Swan</i>	170	3	22 *	3	44	<i>Redstart</i>	133	-6	34 *	12	60
<i>Greylag Goose</i>	86	43	132 *	78	201	Whinchat	78	13	-15	-34	9
Canada Goose	300	32	92 *	68	120	<i>Stonechat</i>	80	14	153 *	88	241
<i>Shelduck</i>	114	25	-34 *	-45	-20	Wheatear	237	15	10	-3	25
Mallard	926	13	39 *	30	48	Blackbird	1803	2	16 *	13	19
Tufted Duck	122	-25	36 *	11	67	Song Thrush	1394	1	13 *	8	19
Sparrowhawk	264	-10	-13	-26	2	<i>Mistle Thrush</i>	946	0	1	-7	9
Buzzard	475	7	51 *	36	68	Grasshopper Warbler	59	15	20	-15	70
<i>Kestrel</i>	505	-1	-30 *	-37	-22	Sedge Warbler	242	-17	30 *	14	48
<i>Red Grouse</i>	101	-13	5	-15	29	Reed Warbler	87	9	29 *	6	57
Red-legged Partridge	372	-3	21 *	8	36	Lesser Whitethroat	204	-6	-27 *	-38	-14
Grey Partridge	216	5	-18 *	-31	-3	Whitethroat	978	2	30 *	22	38
Pheasant	1236	5	16 *	10	22	Garden Warbler	369	-8	-13 *	-23	-1
Moorhen	503	3	22 *	11	35	Blackcap	1046	-1	46 *	38	55
Coot	191	-4	51 *	29	75	<i>Wood Warbler</i>	56	-26	-58 *	-69	-42
<i>Oystercatcher</i>	231	-12	-18 *	-26	-9	Chiffchaff	938	15 *	21 *	14	29
Golden Plover	75	-15	-26 *	-42	-7	<i>Willow Warbler</i>	1202	-18 *	-8 *	-13	-4
<i>Lapwing</i>	533	-6	-18 *	-24	-11	<i>Goldcrest</i>	534	-5	65 *	51	80
<i>Snipe</i>	117	14	52 *	26	84	Spotted Flycatcher	194	-27	-42 *	-52	-31
<i>Curlew</i>	429	-9	-20 *	-26	-13	Pied Flycatcher	43	13	-7	-31	24
<i>Redshank</i>	68	-31	-25 *	-40	-5	Long-tailed Tit	630	-20 *	-3	-13	9
Common Sandpiper	61	-26	-25 *	-42	-3	Marsh Tit	122	-6	34 *	8	68
<i>Black-headed Gull</i>	428	-17	-33 *	-40	-25	Willow Tit	55	-39	-72 *	-81	-59
<i>Common Gull</i>	122	-31 *	-21 *	-34	-5	Coal Tit	543	21 *	28 *	18	40
<i>Lesser Black-backed Gull</i>	424	-38 *	-15 *	-26	-4	Blue Tit	1681	6	9 *	5	13
<i>Herring Gull</i>	460	14	23 *	10	37	Great Tit	1537	0	19 *	13	24
Great Black-backed Gull	84	-9	-2	-21	22	Nuthatch	294	24	44 *	26	64
Common Tern	45	60	-4	-30	32	Treecreeper	264	8	19 *	2	39
Feral Pigeon	534	-8	-6	-15	3	Jay	513	27 *	16 *	5	29
<i>Stock Dove</i>	585	6	15 *	4	27	Magpie	1401	-8	2	-2	7
Wood Pigeon	1826	1	5 *	1	9	Jackdaw	1178	-5	12 *	5	19
Collared Dove	988	5	26 *	19	33	Rook	1002	-5	0	-8	8
Turtle Dove	187	-23	-42 *	-52	-30	Carrion Crow	1712	-2	15 *	10	21
<i>Cuckoo</i>	727	-9	-25 *	-32	-18	Hooded Crow	104	-17	-31 *	-47	-9
Little Owl	89	13	26	-3	64	Raven	165	-6	56 *	28	91
Tawny Owl	77	-28	-35 *	-52	-13	Starling	1465	-8	-13 *	-18	-7
Swift	847	-13	-30 *	-36	-24	House Sparrow	1227	-1	-7 *	-11	-3
<i>Kingfisher</i>	41	85	76 *	21	157	Tree Sparrow	133	25	55 *	26	91
<i>Green Woodpecker</i>	549	-6	18 *	7	30	Chaffinch	1806	-2	5 *	2	8
Great Spotted Woodpecker	594	12	72 *	55	89	Greenfinch	1301	-2	31 *	24	38
Skylark	1375	-7	-14 *	-17	-10	Goldfinch	1031	8	18 *	10	27
<i>Sand Martin</i>	96	-16	17	-9	51	Siskin	113	-30	-18	-34	2
<i>Swallow</i>	1419	-8	10 *	4	16	Linnet	1009	1	-4	-11	3
<i>House Martin</i>	723	-12	18 *	8	29	<i>Lesser Redpoll</i>	118	4	18	-5	47
<i>Tree Pipit</i>	122	-11	1	-17	24	Bullfinch	437	-3	-26 *	-35	-17
<i>Meadow Pipit</i>	619	-9	-5	-10	0	Yellowhammer	995	-1	-13 *	-18	-9
<i>Yellow Wagtail</i>	155	-9	-14	-28	2	Reed Bunting	329	5	3	-8	15
<i>Grey Wagtail</i>	154	4	52 *	25	86	Corn Bunting	142	-9	-41 *	-50	-29
<i>Pied Wagtail</i>	959	-3	23 *	15	33						

several species in England differed from those for the UK. Mistle Thrush, Long-tailed Tit, Linnet and Reed Bunting all showed significant declines in England, compared to stable populations across the UK as a whole. Tree Pipit also declined significantly by 27% in England, compared to a non-significant increase of 1% for the UK, while a non-significant decline in Sparrowhawk numbers in the UK, concealed a significant decline of 20% in England. The significant UK increases in Tree Sparrow and

Kingfisher numbers were only matched by non-significant increases in England. Only Redshank and Common Tern numbers fared considerably better in England than in the UK.

Scotland

A total of 153 species were recorded on BBS visits in Scotland in 2002 and of these, the Chaffinch was the most widespread, being recorded on 76% of squares, closely followed by Meadow Pipit

(69%) and Wren, Skylark and Wood Pigeon (all 68%). Of the 57 species that were recorded on an average of 30 or more squares in Scotland (Table 6), ten species had declined significantly and 16 species had increased significantly between 1994 and 2002.

For many species, the trends in Scotland were broadly similar to those for the UK overall, including the significant increases in Buzzard and Raven and increases in the numbers of small-bodied residents such as Goldcrest, Wren and Pied Wagtail, still benefiting from the continued run of relatively mild winters. In contrast to the recent success of the Buzzard, Kestrel numbers

showed a significant decrease in both Scotland (down 42%) and the UK (down 30%). The Meadow Pipit, so characteristic of upland Britain, also showed a significant decline in Scotland (down 11%), similar to the trend in England (down 9%).

With Scotland holding relatively large and important populations of several wader species, both at a national and European level, the short-term significant declines in Oystercatcher (down 24%), Lapwing (down 39%), Golden Plover (down 33%) and Curlew (down 24%) are of concern. Although the declines in Lapwing and Oystercatcher numbers followed their respective UK trends, they contrasted to those for England,

Table 5. ENGLAND. Population changes for species recorded on a mean of 30 or more squares per year for 2000-2002 and 1994-2002 (excluding squares where the species was recorded in only one year). The figures presented are the percentage changes in population levels for the respective time periods, marked with an asterisk where significant. For the 1994-2002 period, the lower and upper 95% confidence limits are given. Conventions as in Table 4.

Species	Sample	Change				Species	Sample	Change			
		00-02	94-02	lcl	ucl			00-02	94-02	lcl	ucl
Little Grebe	39	53	83 *	26	165	Grey Wagtail	98	20	71 *	35	117
Great Crested Grebe	50	12	11	-19	51	Pied Wagtail	728	-6	24 *	14	35
Cormorant	120	-11	10	-10	35	Wren	1389	-3	7 *	3	10
Grey Heron	387	17	8	-4	21	Dunnock	1220	4	10 *	5	15
Mute Swan	145	-5	-12	-25	4	Robin	1358	5	24 *	19	28
Greylag Goose	68	60	118 *	72	175	Redstart	70	0	72 *	33	122
Canada Goose	284	29	80 *	58	106	Whinchat	32	-4	-24	-46	8
Shelduck	95	15	-8	-26	14	Stonechat	30	4	115 *	35	243
Mallard	773	8	35 *	26	45	Wheatear	113	22	13	-6	36
Tufted Duck	105	-10	31 *	5	62	Blackbird	1446	3	14 *	11	18
Sparrowhawk	221	-14	-20 *	-32	-5	Song Thrush	1082	8	14 *	8	20
Buzzard	261	8	58 *	38	81	Mistle Thrush	767	-3	-10 *	-18	-2
Kestrel	435	-10	-23 *	-32	-13	Sedge Warbler	153	2	32 *	12	55
Red Grouse	39	16	14	-12	47	Reed Warbler	83	4	20	-2	46
Red-legged Partridge	368	-2	17 *	4	31	Lesser Whitethroat	194	-8	-29 *	-40	-16
Grey Partridge	189	-1	-26 *	-38	-11	Whitethroat	851	8	36 *	27	45
Pheasant	1049	7	24 *	18	31	Garden Warbler	302	-4	-11	-22	2
Moorhen	461	1	18 *	6	30	Blackcap	917	-4	37 *	29	46
Coot	171	-1	57 *	34	83	Chiffchaff	799	16 *	22 *	14	30
Oystercatcher	106	5	19	-1	43	Willow Warbler	840	-26 *	-33 *	-36	-29
Golden Plover	30	18	4	-25	44	Goldcrest	365	-11	42 *	28	58
Lapwing	426	3	8	-2	18	Spotted Flycatcher	142	-13	-35 *	-47	-20
Snipe	52	-11	3	-23	38	Long-tailed Tit	554	-17	-12 *	-21	-1
Curlew	245	2	-14 *	-22	-5	Marsh Tit	108	9	24	-1	55
Redshank	44	-16	14	-16	57	Willow Tit	48	-42	-71 *	-81	-56
Black-headed Gull	323	-2	-13 *	-23	-1	Coal Tit	352	18	32 *	19	47
Common Gull	50	134	125 *	53	230	Blue Tit	1374	4	5 *	1	9
Lesser Black-backed Gull	307	4	-19 *	-30	-6	Great Tit	1257	-2	14 *	9	20
Herring Gull	288	30	37 *	19	56	Nuthatch	240	21	36 *	18	57
Great Black-backed Gull	36	11	-60 *	-72	-44	Tree Creeper	195	7	1	-15	21
Common Tern	41	22	70 *	16	147	Jay	447	33 *	6	-5	18
Feral Pigeon	450	-7	-11 *	-20	-1	Magpie	1178	-2	0	-5	5
Stock Dove	541	7	14 *	2	26	Jackdaw	932	-6	18 *	10	26
Wood Pigeon	1465	2	8 *	3	12	Rook	791	-4	-9	-17	0
Collared Dove	883	7	28 *	20	35	Carrion Crow	1400	8	21 *	14	27
Turtle Dove	185	-25	-43 *	-52	-31	Raven	46	3	100 *	40	186
Cuckoo	591	-23 *	-47 *	-52	-42	Starling	1213	-5	-24 *	-28	-19
Little Owl	86	13	32	0	73	House Sparrow	1028	-1	-13 *	-17	-9
Tawny Owl	63	-13	-20	-42	10	Tree Sparrow	111	12	16	-8	45
Swift	736	-13	-31 *	-37	-24	Chaffinch	1398	3	9 *	6	13
Kingfisher	35	27	19	-20	77	Greenfinch	1101	-2	31 *	24	38
Green Woodpecker	505	-5	27 *	14	40	Goldfinch	855	11	9 *	1	18
Great Spotted Woodpecker	531	12	65 *	50	83	Siskin	33	12	-8	-38	37
Skylark	1072	-1	-20 *	-24	-17	Linnet	826	7	-12 *	-19	-5
Sand Martin	64	-49 *	7	-19	41	Lesser Redpoll	47	-1	-22	-45	13
Swallow	1094	-4	9 *	3	16	Bullfinch	341	-4	-27 *	-36	-17
House Martin	577	-11	-5	-14	4	Yellowhammer	864	-5	-17 *	-22	-13
Tree Pipit	64	-28	-27 *	-45	-5	Reed Bunting	249	12	-13 *	-24	-2
Meadow Pipit	304	2	-9 *	-15	-2	Corn Bunting	135	5	-35 *	-46	-23
Yellow Wagtail	152	-11	-15	-28	2						

where no significant trends were identified. The decline in Curlew, on the other hand, matched that in England (down 14%). Snipe numbers showed a short-term significant increase of 71% in Scotland compared with little change in England over the same period.

The populations of three species that have shown declines in the UK continued to fare better in Scotland, as shown by the significant changes in numbers of House Sparrow (Scotland +29%, UK -7%), Starling (Scotland +38%, UK -13%) and Willow Warbler (Scotland +25%, UK -8%). Twelve species were recorded on 20-29 squares in Scotland, and hence too few squares for Scottish population trends to be generated. These include three BAP species (Grey Partridge, Spotted Flycatcher and Bullfinch) as well as Redshank, Tree Pipit, Grey Wagtail, Dipper, Whinchat, Stonechat, Blackcap, Chiffchaff and Treecreeper.

Wales

A total of 136 species were recorded on BBS visits in Wales in 2002 and of these, the Carrion Crow was the most widespread, being recorded on 93% of squares, closely followed by Wren (91%), Blackbird (88%) and Chaffinch (88%). Of the 53 species that were recorded on an average of 30 or more squares in Wales (Table 7), eight species had declined significantly and 17 had increased significantly between 1994 and 2002.

The Welsh trends for a number of species followed the UK pattern, including significant declines in Cuckoo, Swift, Starling, Bullfinch and Yellowhammer. However, the increase in Welsh House Sparrow numbers (up 63%) differed from the significant

decline seen for the UK (down 7%). The Welsh trends for several predominantly woodland species also matched the UK pattern, with numbers of Treecreeper, Nuthatch and Great Spotted Woodpecker showing significant increases and Garden Warbler a significant decrease. The Welsh trends of two migrant warbler species also followed the same directions as their respective UK trends, with numbers of Willow Warbler declining and Blackcap increasing.

For many species, the population changes in Wales took the same direction as those for the other three constituent countries, England, Scotland and Northern Ireland. These included significant increases in Wren, Blackbird, Coal Tit, Blue Tit, Great Tit and Goldfinch. However, for some species there were notable differences, including the significant decline in Welsh Chaffinch numbers (down 16%) that contrasted with significant increases of 9% in England and 55% in Northern Ireland. Numbers of House Martin increased significantly in Wales, but were relatively stable in England, while Meadow Pipit also increased significantly in Wales, but declined in England and Scotland.

Species that showed relatively little change in their numbers in Wales, in contrast to significant increases in England, included Green Woodpecker, Collared Dove, Pied Wagtail, Whitethroat, Chiffchaff, Goldcrest, Jackdaw, Carrion Crow, Redstart, Buzzard and Raven. The last two species have a strong westerly bias in their distribution and appear to be spreading eastward. Seven species were recorded on 20-29 squares in Wales and hence too few squares for Welsh indices to be generated (Feral Pigeon, Stock Dove, Grey Wagtail, Stonechat, Wood Warbler, Spotted Flycatcher and Pied Flycatcher).

Table 6. SCOTLAND. Population changes for species recorded on a mean of 30 or more squares per year for 2000-2002 and 1994-2002 (excluding squares where the species was recorded in only one year). The figures presented are the percentage changes in population levels for the respective time periods, marked with an asterisk where significant. For the 1994-2002 period, the lower and upper 95% confidence limits are given. Conventions as in Table 4.

Species	Sample	Change		lcl	ucl	Species	Sample	Change		lcl	ucl
		00-02	94-02					00-02	94-02		
Grey Heron	41	8	113 *	37	229	Robin	150	-22	-8	-21	7
Mallard	82	11	50 *	17	93	Wheatear	73	24	10	-13	39
Buzzard	95	7	73 *	34	122	Blackbird	144	7	10	-3	24
Kestrel	39	45	-42 *	-61	-15	Song Thrush	131	-8	8	-10	31
Red Grouse	57	-25	-3	-28	32	Mistle Thrush	57	-11	33	-6	88
Pheasant	98	1	-14	-29	6	Sedge Warbler	47	-24	53 *	11	110
Oystercatcher	116	-14	-24 *	-35	-12	Whitethroat	53	-19	12	-20	57
Golden Plover	44	-22	-33 *	-52	-7	Willow Warbler	172	-9	25 *	9	43
Lapwing	84	-13	-39 *	-50	-26	Goldcrest	69	10	137 *	82	210
Snipe	52	16	71 *	27	130	Coal Tit	95	13	13	-8	39
Curlew	122	-12	-24 *	-35	-11	Blue Tit	117	6	11	-7	33
Common Sandpiper	36	-22	-23	-46	9	Great Tit	104	0	25	0	57
Black-headed Gull	72	-41	-68 *	-76	-56	Magpie	33	-12	29	-10	83
Common Gull	66	-36	-31 *	-46	-11	Jackdaw	88	12	15	-9	46
Lesser Black-backed Gull	60	-54 *	-5	-31	30	Rook	97	-9	5	-21	40
Herring Gull	95	16	13	-13	47	Carrion Crow	147	-23	3	-14	24
Great Black-backed Gull	34	-13	67 *	10	155	Hooded Crow	50	-32	-59 *	-73	-39
Feral Pigeon	50	12	4	-28	51	Raven	37	-19	71 *	10	167
Wood Pigeon	156	5	-12	-24	1	Starling	119	-1	38 *	8	75
Collared Dove	34	-16	-27	-52	13	House Sparrow	72	-2	29 *	4	59
Cuckoo	64	-4	30	-2	73	Chaffinch	189	-5	1	-8	12
Swift	39	-4	-51 *	-68	-25	Greenfinch	80	9	18	-10	55
Skylark	186	3	-1	-11	11	Goldfinch	59	12	56 *	9	123
Swallow	131	-6	-5	-20	13	Siskin	56	-36	-18	-42	15
House Martin	43	-34	174 *	68	346	Linnet	78	21	34 *	3	75
Meadow Pipit	195	-8	-11 *	-20	-1	Lesser Redpoll	36	4	26	-16	88
Pied Wagtail	114	7	30 *	5	61	Yellowhammer	86	9	8	-11	32
Wren	174	-25 *	38 *	19	59	Reed Bunting	39	-5	28	-11	83
Duncock	99	-3	15	-9	47						

Northern Ireland

A total of 104 species were recorded on BBS visits in Northern Ireland in 2002 and of these, the Wren was the most widespread, being recorded on 95% of squares, closely followed by Swallow (94%) and Chaffinch (92%). Of the 20 species that were recorded on an average of 30 or more squares in Northern Ireland (Table 8), no species had declined significantly and 12 species had increased significantly between 1994 and 2002.

Because of the relatively small number of squares surveyed in Northern Ireland, we are only able to produce population indices for the most widespread and numerous birds in the Province. Most of these common species are increasing in numbers, and this is borne out by the BBS results from Northern Ireland. Several typical garden and woodland species showed strong and significant upward trends, including Wren, Dunnock, Robin,

Blackbird, Blue Tit, Great Tit, Coal Tit and Chaffinch. Of the four corvid species included in the analysis, Magpie and Rook numbers increased significantly and the 90% increase in Hooded Crow differed sharply from the significant decline of 59% seen in Scotland. Willow Warbler numbers, however, followed their counterparts in Scotland by increasing significantly (up 47%), contrasting to the significant declines shown in England (down 33%) and Wales (down 28%). Only House Sparrow (down 34%) and Jackdaw (down 11%) showed any decline in numbers, although neither result was significant.

Seven species were recorded on 20-29 squares in Northern Ireland and hence too few squares for Northern Irish indices to be produced (Curlew, Skylark, House Martin, Pied Wagtail, Sedge Warbler, Chiffchaff, Goldcrest, Greenfinch, Linnet and Reed Bunting).

Table 7. WALES. Population changes for species recorded on a mean of 30 or more squares per year for 2000-2002 and 1994-2002 (excluding squares where the species was recorded in only one year). The figures presented are the percentage changes in population levels for the respective time periods, marked with an asterisk where significant. For the 1994-2002 period, the lower and upper 95% confidence limits are given. Conventions as in Table 4.

Species	Sample	Change		lcl	ucl	Species	Sample	Change		lcl	ucl
		00-02	94-02					00-02	94-02		
Grey Heron	35	-4	23	-18	84	Whitethroat	61	-20	-7	-27	20
Mallard	52	53	-8	-32	25	Garden Warbler	52	-25	-29 *	-48	-2
Buzzard	109	8	11	-9	36	Blackcap	87	0	64 *	31	105
Pheasant	63	-22	-18	-36	6	Chiffchaff	95	16	6	-12	27
Curlew	38	-11	-18	-43	19	Willow Warbler	134	-22	-28 *	-36	-18
Lesser Black-backed Gull	45	-42	17	-32	101	Goldcrest	68	-21	-1	-20	23
Herring Gull	56	-16	58 *	15	116	Long-tailed Tit	47	11	29	-17	102
Wood Pigeon	145	1	10	-3	25	Coal Tit	59	58	33 *	4	71
Collared Dove	51	-7	9	-19	47	Blue Tit	135	22	28 *	13	46
Cuckoo	55	-21	-33 *	-51	-6	Great Tit	128	10	31 *	12	53
Swift	56	-23	-32 *	-53	-2	Nuthatch	53	33	68 *	22	131
Green Woodpecker	38	-17	8	-29	64	Treecreeper	36	-33	70 *	9	164
Great Spotted Woodpecker	45	11	68 *	16	141	Jay	53	-10	1	-29	42
Skylark	87	-12	-11	-23	4	Magpie	131	-26	-10	-24	7
Swallow	132	1	39 *	16	66	Jackdaw	107	-3	3	-16	26
House Martin	74	-24	54 *	14	107	Rook	66	-4	-4	-33	39
Tree Pipit	30	-13	-8	-38	37	Carrion Crow	156	-4	7	-7	24
Meadow Pipit	72	5	23 *	7	43	Raven	65	7	7	-21	44
Pied Wagtail	91	-5	0	-21	26	Starling	77	-3	-44 *	-58	-26
Wren	152	5	19 *	8	32	House Sparrow	90	1	63 *	35	98
Dunnock	114	10	15	-3	37	Chaffinch	152	-3	-16 *	-25	-7
Robin	149	-3	17 *	6	29	Greenfinch	82	-8	20	-5	51
Redstart	52	-13	2	-20	30	Goldfinch	92	-7	64 *	28	110
Wheatear	42	-19	-5	-33	33	Linnet	77	-39	13	-15	50
Blackbird	149	2	24 *	12	36	Bullfinch	47	-11	-37 *	-56	-12
Song Thrush	126	-7	25 *	7	45	Yellowhammer	37	8	-31 *	-50	-4
Mistle Thrush	81	6	5	-20	38						

Table 8. NORTHERN IRELAND. Population changes for species recorded on a mean of 30 or more squares per year for 2000-2002 and 1994-2002 (excluding squares where the species was recorded in only one year). The figures presented are the percentage changes in population levels for the respective time periods, marked with an asterisk where significant. For the 1994-2002 period, the lower and upper 95% confidence limits are given. Conventions as in Table 4.

Species	Sample	Change		lcl	ucl	Species	Sample	Change		lcl	ucl
		00-02	94-02					00-02	94-02		
Wood Pigeon	52	-21	24	-8	67	Coal Tit	37	40	142 *	37	328
Swallow	54	-35	13	-18	55	Blue Tit	47	1	49 *	8	104
Meadow Pipit	45	-43 *	28	-3	70	Great Tit	41	-5	99 *	32	202
Wren	59	-21	64 *	27	112	Magpie	53	-18	34 *	2	76
Dunnock	42	-6	187 *	76	368	Jackdaw	46	-15	-11	-36	26
Robin	56	-18	28 *	1	62	Rook	46	1	58 *	7	132
Blackbird	56	-17	92 *	49	147	Hooded Crow	48	1	90 *	28	182
Song Thrush	47	-6	28	-11	84	Starling	48	-44	53	0	133
Mistle Thrush	37	39	42	-11	127	House Sparrow	32	-22	-34	-58	3
Willow Warbler	51	-27	47 *	7	101	Chaffinch	57	-25	55 *	16	107

Government Office Regions within England

The nine Government Office Regions are as follows:

GOR 1 (North West) – Cumbria, Lancashire, Greater Manchester and Cheshire (inc. Wirral)

GOR 2 (North East) – Northumberland, County Durham and Cleveland

GOR 3 (Yorkshire & The Humber) – North Yorkshire, West Yorkshire, East Yorkshire, South Yorkshire and North Lincolnshire

GOR 4 (East Midlands) – Lincolnshire, Nottinghamshire, Derbyshire, Leicestershire, Rutland and Northamptonshire

GOR 5 (East of England) – Norfolk, Suffolk, Cambridgeshire, Essex, Bedfordshire and Hertfordshire

GOR 6 (West Midlands) – Staffordshire, Birmingham, Shropshire, Warwickshire, Hereford and Worcestershire

GOR 7 (South East) – Kent, Sussex, Surrey, Hampshire, Berkshire, Buckinghamshire and Oxfordshire

GOR 8 (South West) – Avon, Cornwall, Devon, Somerset, Dorset, Wiltshire and Gloucestershire

GOR 9 London

The good coverage achieved in England meant that we were able to generate population trends for a large number of species in the nine English Government Office Regions (Table 9). The nine regions are made up of the groups of counties listed above. Since climate, agriculture and habitats vary throughout England, major regional differences in population trends may point us towards possible reasons for decline. Coverage varies considerably from one region to another, with the number of squares surveyed being largely dependent upon the number of BBS observers available in that area. As a result of ongoing work to determine how many occupied squares are needed to generate reliable population trends, we report trends only for species with a sample size of at least 30 squares. The variation in coverage meant that population trends could be generated for only 16 species in each of the North East and London regions, compared to 64 species in the South East and 66 species in the East of England. For 74 species, there were records from enough squares for trends to be generated in at least one region, while for 44 species we could produce trends for five or more regions.

For some species, trends in the different regions were very similar. Skylark numbers declined significantly in seven regions, with these downward trends being at their greatest in the west of the country (South West, West Midlands and North West England). Significant declines in Cuckoo, Bullfinch and Yellowhammer were also recorded in the majority of regions for which trends could be generated, with the greatest decline in Yellowhammer numbers being recorded in the South East (down 32%). Willow Warbler numbers showed a significant decline in five regions, with a south to north gradient in the magnitude of the trends. Declines in excess of 50% were recorded in the South East, South West and East of England between 1994 and 2002, while downward trends for the North West, North East and East Midlands were not significant. Looking at the more recent picture, Willow Warbler numbers also declined significantly between 2000 and 2002 in four regions.

For ten species (Canada Goose, Mallard, Pheasant, Collared Dove, Great Spotted Woodpecker, Robin, Blackcap, Chiffchaff,

Carrion Crow and Greenfinch), a significant increase in numbers was recorded in the majority of the regions for which trends could be generated. Great Spotted Woodpecker numbers had increased significantly by more than 40% in five of the regions and increases in Chiffchaff were greatest in the Midlands and north of England.

Of the three raptor species for which trends could be generated, Sparrowhawk showed significant declines in two of the three regions analysed, including significant declines in the East (down 50%) and South West (down 37%). Kestrel numbers were reasonably stable in the East and West Midlands and Yorkshire, but also showed significant declines in the East (down 48%) and South West (down 51%). The picture for Buzzard was much more positive, with significant increases of 77% in the West Midlands, a massive five-fold increase in the South East and a significant increase of 19% in one of its traditional strongholds, the South West. These increases reflect the eastward spread of the Buzzard, a species that is recolonising areas from which it was wiped out in the 19th century.

For the remaining species, a more varied and complicated picture emerged, with declines in one part of England contrasting with increases elsewhere. A significant decline in Swift numbers was recorded in the South East (down 48%), South West (down 55%) and East of England (down 29%), while a significant increase of 53% was recorded in the West Midlands. Numbers in the four remaining regions for which population indices could be generated showed non-significant, downward trends.

House Sparrow numbers declined significantly in three regions, including a substantial 71% decline in London that contrasted with a significant increase of 18% in the East Midlands. The only region to show a significant increase in Rook numbers was the East of England, while significant declines were recorded in the North West, West Midlands and South East.

BBS mammal monitoring in 2002

In 2002, 85% of observers surveyed their BBS squares for mammals and submitted records for 1,814 squares, along with their bird data. Table 10 shows the 20 most frequently recorded mammal species in 2002. The first two columns of data show the number and percentage of squares each mammal species was known to be seen or present in. The next two columns show the number and percentage of squares each mammal species was actually seen and counted in and the final column the total number of individuals counted.

For several species the vast majority of records are for individuals seen and counted during the two bird count visits. These include such obvious diurnal species as Rabbit, Grey Squirrel, Brown Hare and some of the deer. For many mammals species however, a large proportion of the records come from presence only, such as field signs, dead animals and local knowledge of the species' presence on that site. These include largely nocturnal, crepuscular, or otherwise elusive species such as Red Fox, Badger, Hedgehog and most of the mustelids.

In addition to the species listed above, a further 22 mammals were recorded during the survey, including (number of squares in brackets): Otter (16), Water Vole (13), Field Vole (12), Wood Mouse (8), Bank Vole (5), Pygmy Shrew (4), Pipistrelle (4), Grey Seal (4), House Mouse (3), Chinese Water Deer (3), Feral Goat (3), Water Shrew (2), Orkney Vole (2), Ferret (2), Pine Martin (2), Common Seal (2) and six species on single squares, included Harvest Mouse, Greater Horseshoe Bat, Lesser White-toothed Shrew on the Scilly Isles, Red-necked Wallaby in Oxfordshire and two Minke Whales off the west coast of Scotland.

Table 10. Occurrence of common mammal species on BBS squares in 2002

<i>Mammal</i>	<i>No. squares in which present</i>	<i>%</i>	<i>No. squares in which seen</i>	<i>%</i>	<i>No. individuals counted</i>
Rabbit	1,294	71%	1,129	62%	11,266
Grey Squirrel	676	37%	524	29%	1,101
Red Fox	632	35%	230	13%	293
Mole	610	34%	0	0%	0
Brown Hare	605	33%	537	30%	1,891
Roe Deer	408	22%	300	17%	723
Feral Cat/Domestic Cat	365	20%	252	14%	541
Badger	305	17%	8	>1%	9
Hedgehog	197	11%	15	1%	19
Brown Rat	187	10%	23	1%	35
Stoat	111	6%	15	1%	16
Muntjac Deer	110	6%	57	3%	88
Fallow Deer	90	5%	51	3%	319
Weasel	88	5%	10	1%	10
Red Deer	75	4%	43	2%	832
Mountain/Irish Hare	53	3%	39	2%	179
Red Squirrel	27	1%	12	1%	15
Mink	25	1%	0	0%	0
Common Shrew	19	1%	11	1%	19
Sika Deer	17	1%	9	>1%	36

Habitat coverage

In total, the habitat details for 20,568 200 m transect sections were completed in 2002. Table 11 shows the percentage of sections containing each of the nine primary habitat categories that were recorded in the First Habitat columns for the UK and the four constituent countries. Although these figures do not allow for differences in sampling effort among regions of the UK, they illustrate marked differences between the four countries. Scotland recorded a much larger percentage of heathland and bog and semi-natural grassland and a much smaller percentage of human sites and farmland. Northern Ireland, by contrast, recorded

a very high percentage of farmland, but a relatively small percentage of woodland and human sites. As you would expect from the most heavily populated of the four countries, England recorded the highest percentage of human sites, but a much smaller percentage of heathland and bog, and semi-natural grassland.

Figure 2 shows the percentage of sections containing each of the farmland habitat categories that were recorded in the First Habitat columns for the four constituent countries. Figure 2 shows that there are marked differences between the percentage of sections containing each farmland habitat in the four countries. In Wales and Northern Ireland, improved grassland forms a very large proportion of the farmland habitat, whereas arable land forms less than 10% in both countries. Arable farmland forms a much larger proportion of the total in both England and Scotland, although this figure does not take into account the differing sampling effort within these countries (i.e. remote upland areas tend to be poorly represented). The proportion of unimproved grassland, by contrast, forms a relatively similar proportion of the total in each of the four countries.

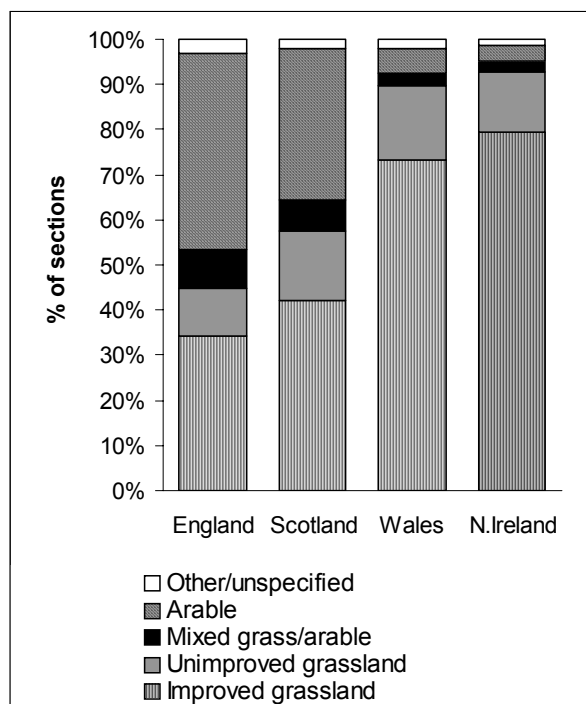


Figure 2. Farmland habitat coverage in 2002. The percentage of transect sections containing each farmland habitat category in the four countries.

Table 11. Habitat coverage in 2002. The percentage of 200 m transect sections containing each habitat category in the UK and the four constituent countries.

<i>Habitat category</i>	<i>UK</i>	<i>Eng.</i>	<i>Scot.</i>	<i>Wales</i>	<i>N. Ire.</i>
Woodland	12.6%	11.5%	18.6%	16.7%	6.8%
Scrubland	2.5%	1.9%	4.9%	4.4%	2.6%
Semi-natural grassland	4.8%	3.6%	10.5%	8.1%	4.3%
Heathland & bog	5.5%	2.3%	24.8%	6.1%	11.9%
Farmland	55.1%	58.1%	32.7%	50.6%	67.5%
Human sites	16.9%	19.9%	5.4%	11.1%	6.3%
Water bodies	1.8%	2.1%	2.0%	0.8%	0.1%
Coastal	0.6%	0.5%	0.8%	1.2%	0.5%
Inland rock	0.3%	0.3%	0.3%	0.9%	0.1%
Total no. Sections	20,568	15,340	2,185	2,052	928

BBS research and development

BBS Online <http://www.bto.org/bbs>

With the successful implementation of Migration Watch and the Garden BirdWatch web applications in 2002, it was decided to make the BBS partially web based. The creation of this new system, BBS Online, is being undertaken by our information systems team at the BTO, with funding for the development project generously provided by the RSPB. The primary aim of BBS Online is to collect and present all of the information that is currently paper-form based from recorders who wish to use the Internet to enter their data. It is designed to offer an alternative method of submission for recorders to enter their data online. BBS Online will enable BBS observers to enter bird, mammal and habitat data collected from their squares into a new BBS database via the web.

BBS Online will provide many features that have previously been unavailable with the paper form system. From the BBS observer's point of view, they will be able to keep a permanent record of the habitat data and bird and mammal counts they have collected from their squares. The data entry screen for the bird counts will mimic the Field Recording Sheet, thus dispensing with the need to manually transpose the data from this form to the Count Summary Sheet. The data entry facilities will also validate the entries as they are input, including checks for incorrect species codes, large counts and species recorded outside their normal breeding range. The observer will be able to view current and historical bird count data for their squares in raw and summarised form, together with the mammals and nest count records. Historical habitat data can also be viewed, providing an interesting record of how habitats on your square have changed over time. Previous visit dates will be displayed, enabling the observer to plan their fieldwork and helping to ensure greater consistency in the timing of visits year after year.

A wide range of outputs will also be made available to all those using the system, including: coverage maps; species distribution maps; species lists for countries, English regions and counties and tables and graphs showing the population trends. Separate UK coverage maps for each year will show the location of surveyed BBS squares. Species distribution maps will be generated for each year and for all species that we are able to produce population trends, as well as a number of selected species recorded in less than 40 squares annually. Summary tables for each country, English region and county will list the number of squares each species was recorded in, together with the sum of the maximum bird counts from each square. All tabulated outputs can be copied into a spreadsheet or word processor document to be used for research or in a local county bird report.

From the ROs' perspective, BBS Online will enable them to manage observer recruitment and square allocation for new and existing observers using the new system. It will enable the RO to keep track of who has entered data for which square in the current year as well as look at who has covered which squares in the past.

Garden BirdWatch Online and Migration Watch have proved to be very popular with users, who have found the systems easy to use. In common with these systems, help screen facilities and lists of frequently asked questions will be available on BBS Online and technical support will be provided. Experience from Garden BirdWatch Online has shown us that the use of a web-based system for BBS will make the scheme appeal to a larger audience. This will both help to increase coverage in areas where it is needed, and publicise BBS results and the work done by the scheme to the wider public.

BBS habitat data is a useful predictor of bird abundance

BBS data are regularly used to estimate changes in numbers over time, but this dataset can also be used to explore differences in abundance across different landscapes and regions. In work carried out over the last year, we examined the influence of geographical location and habitat type on counts of birds on BBS squares. As would be expected from differences in breeding ranges, most species varied considerably in abundance in relation to latitude, longitude and altitude. It was therefore important to correct for these effects in models that assess the influence of habitat type. Applying these corrections, we then compared predictions of abundance based on BBS habitat data (collected by the volunteers themselves) to those based on independent landscape classifications from the Centre of Ecology and Hydrology (CEH). Results showed that BBS habitat data collected at the 200 m transect section scale were good predictors of bird abundance and were slightly better than predictions based on broader-scale CEH data. This is a gratifying result, highlighting the value of BBS habitat data, which is not only collected at a finer scale than categories based on mapping or satellite imagery, but which is collected annually and hence very up-to-date. One disadvantage of BBS habitat data is that they are only available for the BBS squares surveyed. It is therefore important to link these data to the best available landscape information for the entire country, in order to make predictions of bird abundance in areas outside surveyed squares. The ability to assess where species occur in greatest numbers and where and in which habitats they are declining has important conservation implications.

Pan-European Common Bird Monitoring

A recent initiative at the European scale is the start of the Pan European Common Bird Monitoring project. Funded by RSPB, this project aims to bring together results from existing national bird survey schemes to produce Pan-European indices (e.g. the European skylark index) and to aid the development of new bird survey schemes in countries where they are lacking, possibly through international plots. This is important because conservation measures to safeguard birds and their habitats are increasingly being taken at the European level. The Prague-based PECBM coordinator (Dr Petr Vorisek), with the help of RSPB, Birdlife International, the Czech Ornithological Society, Statistics Netherlands, SOVON and BTO, recently organised a workshop with national bird monitoring scheme organisers across Europe to take the project forward. The proposals, which also include the production of a State of Birds in Europe booklet and the production of a series of Pan-European wild bird indicators were favourably received and more than 20 countries pledged to provide population indices in the required format. BTO provided CBC results from 1970 for this version, but BBS and joint BBS-CBC trends will be used subsequently. The resulting indices and indicators should be completed and published later this year.

Mapping species abundance

The last Breeding Bird Atlas of 1988-91 presented maps of species abundance for all widespread bird species in Britain and Ireland (Gibbons *et al.* 1993). Abundance maps of this type are of huge importance, not only in highlighting the strongholds of particular species or change maps showing areas of significant population change, but they allow information such as this to be made

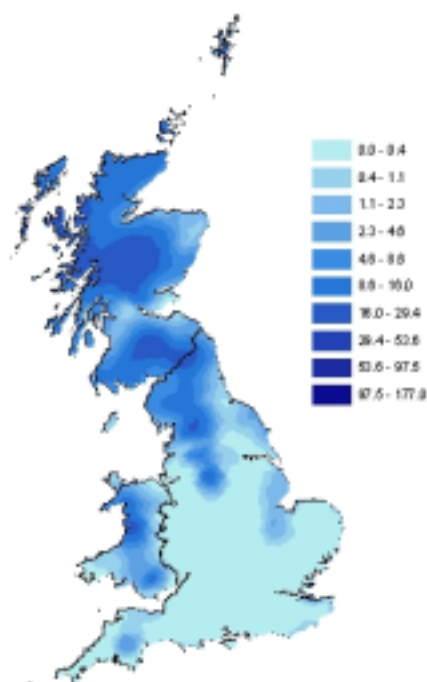


Figure 3. Map of predicted abundance for the Meadow Pipit in Britain using BBS data for 2000. Predicted abundance refers to the number of individuals per 1 km square.

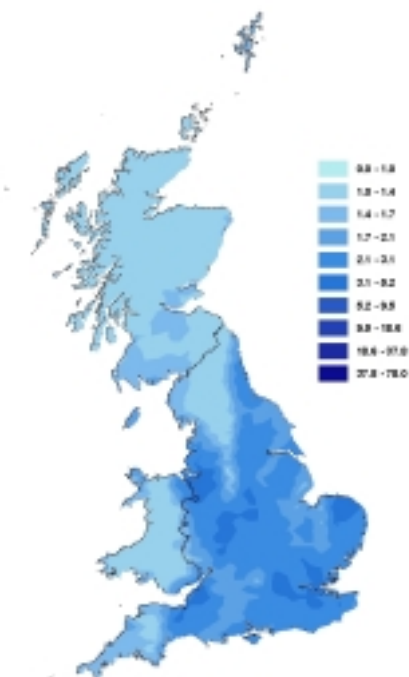


Figure 4. Map of predicted abundance for the Collared Dove in Britain using BBS data for 2000. Predicted abundance refers to the number of individuals per 1 km square

accessible to a much wider audience than would normally be possible. Over the last ten years, there have been considerable advances in the development of software that integrate geostatistics within a Geographic Information System (GIS). In work to examine the potential of these recent software advances, we applied these techniques to produce smoothed distributions of abundance using counts on BBS squares. Results showed that it was possible to produce maps that matched well the expected distribution and abundance for species that are well monitored by the BBS. To illustrate, we show predicted abundance maps for Meadow Pipit and Collared Dove below. Meadow Pipit abundance is highest in upland areas of Scotland, Wales and the

Peak District, whilst the Collared Dove has its highest abundance in suburban and rural areas around London, in Norfolk from where the species was first recorded, and around Birmingham and Manchester. A quick glance at the last Breeding Bird Atlas will confirm the good match, for these two species at least. Future plans are to produce and publish these maps for as many BBS species as possible, and potentially to integrate this information with the collection of data for the next breeding bird atlas.

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The Future


The 2002 fieldwork season was a very successful one for the Breeding Bird Survey, with most observers continuing to survey their squares after the break in 2001. The outlook for 2003 is very good and it is hoped that we will get back to the levels of coverage achieved in 2000. It is vitally important that we continue to monitor our sometimes struggling bird populations across a wide variety of habitats and it is only by continuing to survey our BBS squares year after year that we can do this. Good coverage throughout the UK in 2003 will enable us to continue monitoring species that we have looked at over the past eight years and hopefully expand our knowledge of the differing regional trends within individual species. By next year this information will be integrated with historical CBC data to provide reliable long-term trends for as many species as possible. We continue to work to improve both the coverage and overall running efficiency of the survey. BBS Online will be in 2004 and will enable observers to input their BBS data directly via the web and to look at the results from both their own squares and elsewhere, at regional and national levels.


SPECIAL THANKS

We would like to thank all BBS volunteers and ROs for making the survey 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 for 2002:

 **ENGLAND:** Avon – John Tully; Bedfordshire – Phil Cannings; Berkshire – Chris Robinson; **Birmingham & West Midlands** – vacant; Buckinghamshire – Mick A'Court; Cambridgeshire – John Le Gassick; Cheshire (mid) – Paul Miller; Cheshire (north & east) – David Jones; Cheshire (south) – Charles Hull; Cleveland – Russell McAndrew; Cornwall – John Woodland; Cumbria (north) – John Callion; Cumbria (south) – Stephen Dunstan; Derbyshire (north & south) – Dave Budworth; Devon – John Woodland; Dorset – Catherine Whitby; Durham – David Sowerbutts; Essex (north-east) – Peter Dwyer; Essex (north-west) – Roy Ledgerton; Essex (south) – Jean Stone; Gloucestershire – Mike Smart; Hampshire – Glynne Evans; Herefordshire – Steve Coney; Hertfordshire – Chris Dee; Huntingdon & Peterborough – Bob Titman; Kent – Martin Coath; Lancashire (east) – Tony Cooper; Lancashire (north-west) – Dave Sharpe; Lancashire (south) – Philip Shearwood; Leicestershire & Rutland – Jim Graham; Lincolnshire (east) – Rob Watson; **Lincolnshire (north)** – vacant; Lincolnshire (south) – Richard and Kay Heath; Lincolnshire (west) – Peter Overton; London & Middlesex – Derek Coleman; Manchester – Judith Smith; Merseyside – Bob Harris; Norfolk (north-east) – Chris Hudson; Norfolk (north-west) – Mike Barrett; Norfolk (south-east) – Graham Coxall; Norfolk (south-west) – Vincent Matthews; Northamptonshire – Bill Metcalfe; Northumberland – Tom and Muriel Cadwallender; Nottinghamshire – Lynda Milner; Oxfordshire (north) – Frances Marks; Oxfordshire (south) – Peter Abbott; Isles of Scilly – Will Wagstaff; Shropshire – Allan Dawes; Somerset – Eve Tigwell; Staffordshire (central & south) – Liz Palmer; **Staffordshire (north)** – vacant; Suffolk – Mick Wright; Surrey – Hugh Evans; Sussex – Barrie Watson; Warwickshire – Joe Hardman; Isle of Wight – James Gloyn; Wiltshire (north) – Mark Lang; Wiltshire (south) – Andrew Carter; Wirral – Kelvin Britton; Worcestershire – Harry Green; **Yorkshire (north-west)** – vacant; Yorkshire (Richmond) – John Edwards; Yorkshire (Harrogate) – Mike Brown; Yorkshire (east) – Frank Moffatt; Yorkshire (north-east) – Michael Carroll; Yorkshire (Bradford) – Mike Denton; Yorkshire (York) – Rob Chapman; Yorkshire (Leeds & Wakefield) – Peter Smale; Yorkshire (south-east & south-west) – Chris Falshaw.

 **SCOTLAND:** Aberdeen – Peter Walker; Angus – Ken Slater; Argyll (south, Bute & Gigha) – David Wood; Argyll (north, Mull, Coll, Tiree & Morvern) – Richard Evans; **Ayrshire** – vacant; Benbecula & the Uists – Paul Boyer; Borders – Alex Copland; Caithness – Hugh Clark; Central Scotland – Neil Bielby; Dumfries – Duncan Irving; Fife & Kinross – Norman Elkins; Inverness – Hugh Insley; Islay, Jura & Colonsay – Malcolm Ogilvie; Kincardine & Deeside – Graham Cooper; Kirkcudbright – Andrew Bielinski; **Lanark, Renfrew & Dunbarton** – vacant; Lewis & Harris – Tony Pendle; Lothian – Alan Heavisides; Moray & Nairn – Bob Proctor; Orkney – Colin Corse; Perthshire – Andrew Wight; Ross-shire – Dave Butterfield; Shetland – Dave Okill; Skye – Roger and Pat Cottis; Small Isles (Rum, Eigg, Muck, Canna) – Bob Swann; **Sutherland** – vacant; Wigtown – Geoff Sheppard.

 **WALES:** Anglesey – Geoff Gibbs; Brecon – John Lloyd; Caernarfon – John Barnes; Cardigan – Moira Convery; Carmarthen – David Poulter; Clwyd (east) – Anne Brenchley; Clwyd (west) – Mel Ab Owain; Glamorgan (west) – Dave Hanford; Glamorgan (mid & south) – Rob Nottage; Gwent – Jerry Lewis; Merioneth – Peter Haveland; Montgomery – Brayton Holt; Pembrokeshire – Rod Hadfield; Radnorshire – Pete Jennings.

 **NORTHERN IRELAND:** Antrim – Ruth Wilson; Armagh – David Knight; Down – Alistair McIlwain; Fermanagh – Phil Grosse; Londonderry – Charles Stewart; Tyrone (south) – Phil Grosse; Tyrone (north) – Mary Mooney.

CHANNEL ISLANDS: Ian Buxton.

ISLE OF MAN: Pat Cullen.

Many thanks also to the following ROs who have retired during the last year and contributed significantly in developing BBS in their respective regions: Paul Boyer, Kelvin Britton, John Callion, Roger & Pat Cottis, Graham Coxall, Geoff Gibbs, Jim Graham, Rod Hadfield, Dave Sharpe, Jean Stone, Paul Stubbs and Bob Titman. We pay special tribute to David Jones of Cheshire and Dave Hanford, both of whom have recently died. We would also like to thank Roger Blakey, John Cameron, David Devonport, Rhian Evans, Martin Godfrey, Tim Grove, Clive Hartley, Terry Hasdell, Gerald Light, Robert McMillan, Annie Poole, Brian Rabbitts, Philip Todd, Tony White and Keith Woods for kindly taking over as BBS Regional Organisers since the 2002 season.

The success of the BBS is dependent on volunteer support throughout the UK. The most valuable data are collected from squares covered by the same observer year after year. We would also like to thank the farmers and landowners for their support and co-operation in allowing BBS volunteers onto their land. We greatly appreciate your continued support.

Please spread the word to other birdwatchers you may know, or even consider taking on another square if you have time. Thanks once again for all your hard work.

If you would like to take part in the BBS, we would be pleased to hear from you.

For further information, please contact:
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