The Breeding Bird Survey 1996 -1997

British Trust for Ornithology

JOINT NATURE CONSERVATION COMMITTEE

RSPB

The Breeding Bird Survey 1996-1997

Report Number 3

BBS

by

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BREEDING BIRD SURVEY

The Breeding Bird Survey partnership comprises:

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ACKNOWLEDGEMENTS

This third Annual Report for the Breeding Bird Survey (BBS) covers the years 1996 and 1997. Over 2,200 volunteers are now involved in the BBS, generously donating their free time to collect bird, habitat and mammal data across the whole of the UK. We would like to thank everyone who has been involved with the BBS since it began in 1994 either as a volunteer carrying out the legwork and counting the birds or as a Regional Organiser promoting the survey to local birdwatchers.

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 David Stroud (JNCC), Dr David Gibbons (RSPB), Dr Stephen Baillie (BTO) and Dr Richard Gregory (BTO).

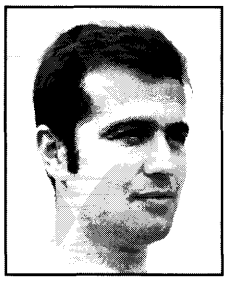
We are grateful to the following people who have provided assistance to the scheme since its inception: Dr Mark Avery (RSPB), Lyn Aylward (BTO), Dr Ian Bainbridge (RSPB), George Boobyer (JNCC), Tracey Brookes (BTO), the late Dr Steve Carter (BTO), Anita Donaghy (RSPB), Dr Colin Galbraith (JNCC), Dr David Gibbons (RSPB), Dr Jeremy Greenwood (BTO), Viv Hiom (BTO), Mike Meharg (EHS), Chris Morley (BTO), Ken Perry (BTO Honorary), Carol Povey (BTO), Nicki Read (BTO), Samantha Rider (BTO), Dr Ken Smith (RSPB), David Stroud (JNCC), Dr Derek Thomas (BTO Honorary), Susan Waghorn (BTO), Jane Wells (BTO) and Richard Weyl (EHS).

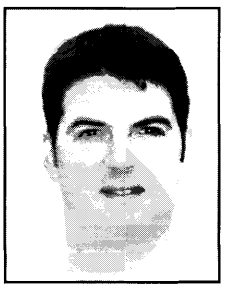
The Pilot Census Project, which was a forerunner of the BBS, was supported under a contract from the JNCC (on behalf of English Nature, Scottish Natural Heritage, Countryside Council for Wales and the Environment and Heritage Service in Northern Ireland). The project to evaluate sampling strategies was funded by the RSPB. Members of the BTO's Integrated Population Monitoring Working Group, Dr Rhys Green, Prof. Steve Buckland, Dr Nicholas Aebischer, Dr John Goss-Custard, Dr Dorian Moss, David Stroud, Dr Ken Smith, Dr Jeremy Greenwood, Dr Will Peach and Dr Humphrey Crick, provided invaluable advice on the survey design.

Maps of coverage and distribution were produced using DMAP which was written by Dr Alan Morton. The cover illustration and BBS logo are by Andy Wilson. Other illustrations in this report are by Simon Gillings, Andy Wilson and Peter Wilson. Report production and design are by Sonia Davies.

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

Profiles





Dr Richard Gregory is the Head of the Census Unit and oversees the running of the CBC, WBS, and most recently the BBS for which he played a key role in the design, development and implementation. He is responsible for the analytical development of the BBS and for associated research. Richard is also involved in a number of other ecological projects at the BTO. He previously studied ecology at York and Oxford Universities.

Richard Bashford is the National Organiser of 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. Before working for the BTO, Richard worked as an Information Officer for the RSPB, coordinating the Birdbus project.

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The Breeding Bird Survey 1996-1997

BBS

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Breeding Bird Survey

EXECUTIVE SUMMARY

1. This is the third annual report of the BTO/JNCC/RSPB Breeding Bird Survey (BBS), covering the years 1996 and 1997 and also the emerging trends from 1994 to 1997. The report details progress since the scheme's introduction in 1994. The primary aim of the survey is to provide representative population trends for a range of common and widespread birds in the UK.

2. Survey plots are based on 1x1 km squares of the National Grid. Squares are chosen on the basis of a formal, stratified, random sampling design, with larger numbers of squares selected in regions with more potential volunteers. The same squares are surveyed year after year. Population indices are calculated using methods that remove the potential for sampling bias.

3. 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 just five hours' fieldwork per year, enabling a large number of people to become involved across the UK.

4. The scheme is organised centrally by BTO Headquarters and regionally by voluntary Regional Organisers (ROs), who in most cases are BTO Regional Representatives. ROs play a vital role in co-ordinating and fostering local fieldwork effort.

5. While the majority of fieldwork is carried out by volunteers, professional fieldworkers, supported by RSPB and the Environment and Heritage Service in Northern Ireland, have covered a number of squares in remote parts of Scotland and Northern Ireland respectively in recent years.

6. Survey coverage and promotion during 1994-1997 are discussed. The number of BBS squares covered each year has increased steadily from 1569 in 1994 to 2169 in 1997. The long-term aim is to survey 2-3000 squares on an annual basis.

7. A total of 209 species was recorded in 1997. For about 100 species we were able to measure population changes with a medium to high degree of precision. In the UK as a whole, 30 species increased significantly and 18 decreased significantly between 1994 and 1997. Of ten species identified as of high conservation concern, nine declined in number, Song Thrush and Corn Bunting significantly so.

8. With four years of BBS monitoring and over 300 squares covered annually in Scotland, we have detailed Scottish population changes for the first time, allowing interesting comparisons with national figures.

9. Mammal recording within the BBS was introduced in 1995 and continued in 1997 recording a total of 40 species. Coverage is limited to those that are likely to be observed by BBS participants.

Coal Tit was recorded in 559 squares in 1997. Recent trends (1994-1997) show that this species appears to be doing fairly well with a significant increase of 35%. (Drawing by Peter Wilson)

INTRODUCTION

Changes in bird populations have long been recognised as a useful indicator of the health of our environment. Developments in our surroundings from urban growth, new roads and housing to changes in farming practices, all have an effect on bird populations and their habitats.

In recent years, it has become clear that we need to improve the monitoring of common land birds across the UK. Following a number of field- and desk-based studies, the BTO, in conjunction with the JNCC and the RSPB, introduced the Breeding Bird Survey (BBS) in 1994. The final design for the BBS combined the need for precise and detailed information with an efficient method. The simple and quick nature of fieldwork has allowed a large number of people to become involved across the UK.

Previous monitoring

The BTO has an international reputation for monitoring bird numbers based largely on the long-running Common Birds Census (CBC) which has been the main monitoring tool for common birds in the UK over the last 35 years. It is based on a survey method known as "territory mapping" which involves intensive fieldwork designed to map breeding territories of birds within a chosen plot. Skilled volunteers make typically nine or ten visits to their plot each year to record birds. Survey maps are returned to BTO HQ where the position and number of bird territories are assessed by trained staff.

The CBC has proved highly valuable in revealing population fluctuations among UK birds and helping to understand their causes. Long-term information of this kind is extremely rare and valuable for that reason. The CBC has played a key role in revising the conservation priorities of UK birds within the *Birds of Conservation Concern*, the *Birds of Conservation Importance* and the *Biodiversity Steering Group* reports.

Few monitoring programmes can compare with the quality and duration of the CBC. Despite its considerable achievements, there are a number of limitations to the territory mapping method as carried out by BTO:

- The geographical distribution of survey plots is not representative of the UK as a whole, with most squares in the south and east.
- Only farmland, woodland and riparian habitats are represented.
- Because observers choose areas they wish to census, the area sampled may not be representative of UK bird populations as a whole.
- Relatively few plots can be covered in total (approximately 230 CBC and 120 Waterways Bird Survey (WBS) plots) because of the time-consuming nature of the fieldwork and analysis required by the mapping method.

  N.B. The CBC is currently being maintained to allow calibration with the BBS.

Aims of the BBS

Our reasons for setting up the BBS were:

- To improve the geographical scope of bird monitoring in the UK;
- To improve the habitat representation of bird monitoring in the UK; and
- To increase species coverage of bird monitoring in the UK, largely as a product of the points above.

The BBS aims to provide precise information on year-to-year and longer-term changes in population levels for a broad spectrum of our commoner breeding birds across the range of regions and habitats in the UK. Our primary objective is to identify declining species that require conservation action and, in combination with other data from the BTO/JNCC's Integrated Population Monitoring Programme, to provide pointers as to the causes of population changes.

In a wider context, the BBS will promote a greater understanding of UK birds through a unique partnership of large numbers of skilled

volunteers with a small number of professional staff at BTO HQ. The result is high quality monitoring information collected in a highly cost-effective manner.

In terms of population trends the BBS will provide:

- Trends for as many species as possible for the UK as a whole, because this information is essential for bird conservation.
- Trends for individual countries within the UK. This information is required by the three country agencies (English Nature, Scottish Natural Heritage and the Countryside Council for Wales) and by the Environment and Heritage Service in Northern Ireland.
- Trends for European Union (EU) regions within the UK. The EU Birds Directive is a key piece of legislation in international bird conservation.
- Trends by habitat type. Conservation of particular species and habitat types will be greatly improved by a more complete understanding of relationships between birds and habitats.

SURVEY METHODS

Selecting survey squares

Survey squares are selected at random from within 83 sampling regions across the UK. In most cases, these are standard BTO regions, but a few smaller regions have been linked with larger ones. BBS regions with larger numbers of potential volunteers are allocated a larger number of squares enabling more birdwatchers to become involved in these areas. This does not introduce bias in our results because the analysis takes account of differences in area and sampling intensity between regions.

Survey design

The principal features of BBS are:

- Standardised bird counts are made in randomly selected 1-km squares of the National Grid.
- An initial site visit is made to set up two 1-km line transects and to record habitat and land use details.
- Two morning visits are made to count birds of all species seen or heard. Birds are recorded from the transect line in one of three distance categories or as in flight.
- Fieldwork is coordinated through a network of BBS Regional Organisers, who, like most of the fieldworkers, are volunteers.

Fieldwork

Full details of methods are given in the BBS instructions which we issue freely from BTO HQ. In brief, fieldwork involves three visits to each survey square each year. The first is to record details of the habitat and to establish the survey route, the second and third to count birds early and late in the season. Early counts take place between early April and mid-May, late counts between mid-May and late June. Both the bird and habitat data are recorded on specially designed forms so that they can be readily processed.

The survey route is made up of two parallel lines, each 1 km in length, although for practical reasons routes typically deviate somewhat from the ideal. Each of these lines is divided into five sections, making a total of ten 200 m sections, and birds and habitats are recorded within these units. Habitat type and land use are recorded annually on a habitat form. Habitat information is essential for interpreting why bird numbers are changing through time and thus focusing conservation effort. BBS habitat recording is also valuable in its own right in measuring land use changes through time across the UK. In this respect, the survey is of unique value, because there is surprisingly little comparable information.

Organisation

The survey is organised locally through a network of Regional Organisers (ROs), who are mostly BTO Regional Representatives. Each RO is provided with a list of target squares for their region at the beginning of each season with the instruction that squares should be allocated in strict order from the top downwards. The highest priority each year is to resurvey squares covered in the previous year and then to find volunteers for any gaps in the list. This ensures the random design of the scheme is maintained. The same squares are surveyed year after year and a new surveyor is found if the original one drops out.

Timetable

Survey forms are sent out to ROs at the start of each year with the bulk of fieldwork being completed between April and June. **We ask that completed forms are then returned to the ROs in July and August, and then on to BTO HQ.** While the great majority of forms are received by the late autumn, forms continue to trickle in, even into the New Year. While we very much welcome these late forms, they can cause difficulties in terms of data checking and inputting. Please try to get your forms back to us as soon as possible after completing fieldwork.

Once received by BTO HQ, the job of checking and processing can then begin in earnest and with 5000-10,000 separate forms this is a considerable task. Forms are double-checked by staff for clarity and obvious mistakes. They are then sent away to be input, before final checking can be completed. All this obviously takes time and so results for any one year will not be available until the following spring or summer. The earlier we receive data, the quicker we are able to report the results back to participants.

Feedback

We acknowledge the safe receipt of BBS forms directly with observers when they reach BTO HQ. Each spring everyone taking part will receive a copy of *Census News*, the newsletter of the Census Unit, and in the autumn a copy of the BBS annual report. Survey news is also reported regularly in *BTO News*, the BTO's bimonthly membership magazine.

Species summaries

Many county-based bird reports have incorporated species summaries from BBS data. These are available from the Census Unit from May each year for the previous year's figures and include counts of common species which are often missing from local reports. Use of BBS data in this form also helps to promote the survey to potential volunteers.

Professional coverage

While the vast majority of fieldwork is carried out by skilled volunteers, professional input is needed in some remote areas in the north and west. The RSPB and the Environment and Heritage Service in Northern Ireland have supported professional fieldwork in Scotland and Northern Ireland respectively. While our aim in the medium term is to increase volunteer effort in these areas, this coverage is extremely valuable in monitoring species and habitats that are rare within the BBS as a whole.

Mammal recording

Mammal recording was introduced to the BBS on a trial basis in 1995, to help improve our knowledge of the distribution and population trends of some of our commoner mammals. The focus of the BBS is on birds but we recognise that the collection of information on extra groups can add great value to the scheme as a whole, in addition to providing added interest for participants. The response so far has been very encouraging and mammal recording within the BBS looks set to continue, providing valuable and much needed data which will be evaluated to determine what can be learned from this form of data collection (see Survey Results).

Which species do we monitor?

The BBS attempts to monitor as many terrestrial breeding species as possible. Of the 215 or so species which breed regularly in the UK, around 80% are monitored annually through a variety of surveys. These are the Heronries Census, the Seabird Monitoring Programme/Seabird Colony Register, the Statutory Conservation Agency/RSPB Annual Breeding Bird Scheme (SCARABBS) and rarer species by the Rare Breeding Birds Panel (RBBP); many of the remaining, more abundant species are the focus of the BBS.

SURVEY NEWS

The 1997 season

We had high hopes of breaking the 2000 squares mark in 1997 with promised increases following targeted promotion around the country. Following the 1996 season, talks were given in Scotland to four more SOC branches and at the SOC/BTO Conference. Five other talks were given in England and BBS was again promoted at bird fairs in England, Scotland and Northern Ireland, and at the BTO Annual Conference at Swanwick. We paid particular attention to areas where we have professional help (Scotland and Northern Ireland). In future years, this support may be reduced so it is important for us to find volunteers to cover these squares as soon as possible.

1998 targets

The emphasis in 1998 is to concentrate our efforts on parts of the country which have low coverage. For the first few years of the survey, most of our attention was focused on Scotland and Northern Ireland. Our coverage in Wales had remained fairly constant since 1994 with a slight increase in 1997. Several talks and meetings were arranged in Wales before the field season of 1998. This promotion coincided with the appointment of Derek Thomas as BTO Wales Officer. Derek had been instrumental in the coordination of our efforts this year and has enrolled the support of the Welsh Ornithological Society who are adopting the BBS. He has also managed to secure some useful publicity about the scheme. As a result, many new volunteers have been coming forward and will hopefully be taking part in the 1998 season. In addition, several newly appointed Regional Organisers have made excellent progress in finding volunteers in previously poorly covered areas. One area where there should be substantial improvement is on the Cheshire-north Wales border. The BTO regions of Mid Cheshire and Clwyd East had a combined total of just 3 squares covered in 1997. The two new ROs in these regions have allocated all 27 squares to volunteers which means that not only the national figure will improve but data at a more regional level will be greatly enhanced. Glamorgan is another area which could well boost the Welsh total. There was a significant increase from 1996 to 1997, with an extra 12 squares being covered, but following targeted promotion in 1998 a further 44 squares were issued with many being allocated to new volunteers by our hard working ROs. Well done to all those involved for such a tremendous effort!

SURVEY RESULTS

Survey coverage

Bumper volunteer recruitment was an outstanding feature of the 1997 season. What is perhaps most amazing is the 1997 increase in the number of 1x1km squares covered - far higher than anticipated, proving that there are plenty more volunteers out there. In 1995 the number of squares covered increased by 181, in 1996 by 167, but in 1997 252 additional squares were surveyed by volunteers.

Thanks to the tremendous efforts of our survey organisers and volunteers around the county, we soon reached and passed the 2000 squares mark (Table 1). Our present total of 2169 will probably increase a little as late forms trickle in but it is pleasing to note that of the returns for 1997, 1689 were also covered in 1996. Since our measure of change is calculated from squares covered through time, this improves the overall accuracy of BBS results.

Perhaps the most amazing increase in square numbers from one region came from Shropshire where nearly forty extra squares were covered, largely because the Shropshire Wildlife Trust and Ornithological Society both adopted the BBS. Elsewhere, BBS enjoyed modest increases of between five and ten squares in twenty regions. The main reasons for these increases are more volunteers coming forward in well-populated regions, new initiatives by ROs, new ROs and circulations to BTO members in regions with no RO.

Species coverage

In 1997, a total of 209 species was recorded (including eight non-naturalised exotics) and five species recorded for the first time. A lucky observer in Wales managed to stumble across a Woodchat Shrike, requiring a new BTO two-letter species code! The other scarce birds recorded for the first time were: Bearded Tit, Capercaillie, White-tailed Eagle and Black-necked Grebe. These species represent useful and interesting local records but the main focus of the BBS is the large number of common and widespread birds we are recording. Tables 2 to 6 illustrate just how successful the BBS is in monitoring the majority of our common breeding birds. Eighty-five species were recorded from over 100 squares in 1996/7 (Table 2). This group of species can be monitored with a good level of accuracy. Note that six species have moved up from Table 3 (birds recorded from 50-100 squares) this year which shows the importance of gaining extra coverage. Because more

Table 1. A breakdown of the BBS squares by country from 1994 to 1997. These are the numbers of squares issued, surveyed or reported as 'uncoverable' by volunteers. The numbers in parenthesis are the percentages of squares surveyed out of those selected. Note that in many areas new squares are issued each year and are added to the end of each region's list. These squares will be covered in future years if volunteers are found.

		England	*Scotland*	*Wales*	*N Ireland*	*Channel Is.*	*Isle of Man*	*Total*
1994	Issued	1648	507	191	74	10	6	2436
	Surveyed	**1170 (71%)**	**246 (49%)**	**123 (64%)**	**25 (34%)**	**1 (10%)**	**4 (67%)**	**1569 (64%)**
	Uncoverable	83	53	14	0	1	1	152
1995	Issued	1843	540	210	76	10	7	2686
	Surveyed	**1322 (72%)**	**283 (52%)**	**123 (59%)**	**17 (22%)**	**1 (10%)**	**4 (57%)**	**1750 (65%)**
	Uncoverable	91	64	14	2	1	1	173
1996	Issued	2050	570	219	78	10	10	2937
	Surveyed	**1415 (69%)**	**308 (54%)**	**118 (54%)**	**65 (83%)**	**7 (70%)**	**4 (40%)**	**1917 (65%)**
	Uncoverable	84	42	9	1	0	1	137
1997	Issued	2359	625	237	100	12	11	3344
	Surveyed	**1634 (69%)**	**312 (50%)**	**137 (49%)**	**74 (73%)**	**6 (50%)**	**6 (55%)**	**2169 (65%)**
	Uncoverable	83	36	12	1	0	2	134

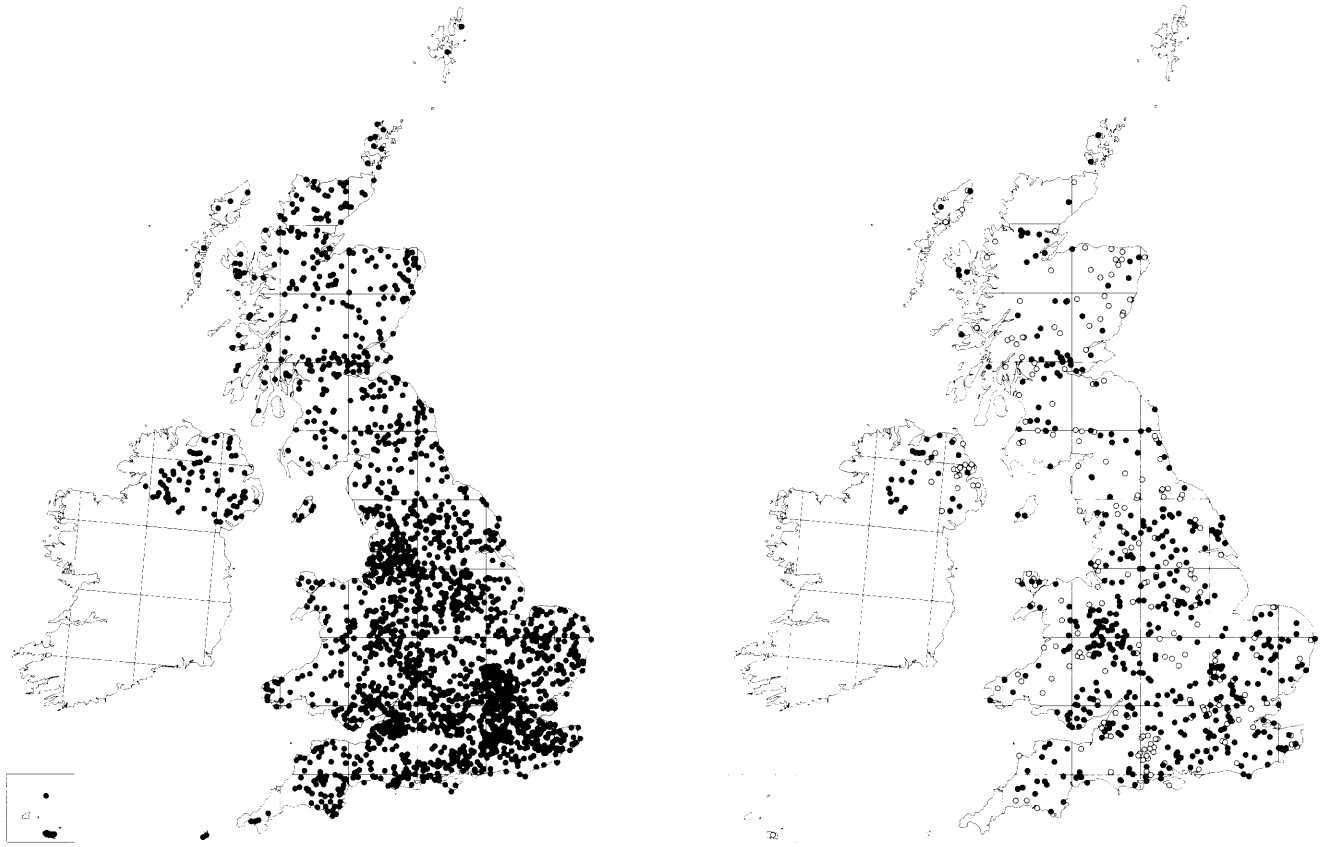


Figure 1. The distribution of BBS plots in 1997. The left-hand map shows the overall coverage in 1997 (2169 squares). The right-hand map shows the gains and losses (closed symbols = squares surveyed for the first time in 1997 and open symbols = squares surveyed in 1996 but not in 1997). The Republic of Ireland is not covered by the BBS but a new scheme to monitor its birds started in 1998 (see page 14).

squares were covered, we are now able to monitor breeding Shelduck, Tufted Duck, Red Grouse, Hooded Crow, Siskin and Redpoll populations with greater precision. That birds such as Red Grouse and Hooded Crow (both of which have a northerly bias to their populations) can be monitored with confidence means that the BBS is achieving one of its main aims and collecting data from northern and upland areas. The last two species, Redpoll and Siskin (recorded in 130 and 131 squares respectively), we are very keen to keep an eye on. The dramatic decline in Redpoll numbers in the late seventies and early eighties means that we can no longer index the population using the CBC, since so few are recorded. Fortunately, we can now continue to monitor this species through the BBS. Previous BTO schemes have not been able to monitor Siskin populations but the BBS is now able to do this. Table 3 changes little from last year apart from the above promotions. The only addition is Crossbill which was recorded in 60 squares in 1997, due to the invasion of this species last summer. There are a few species around the hundred squares mark (Golden Plover, Great Black-backed Gull, Little Owl, Sand Martin and Whinchat), most of which may move to Table 2 next year. The Grasshopper Warbler is particularly interesting as it is a species about which we know relatively little. In 1994, it was recorded from around 45 squares but with major increases in BBS coverage, particularly in Northern Ireland, it is now recorded from 76 squares.

The birds recorded in less than 50 squares are shown in Table 4. Looking through this table, one appreciates the wide range of habitats covered by the BBS. Most BBS field-workers would be happy to see any of the scarcer species listed here, such as Little Egret, Corncrake or Hawfinch. The majority of the species here are unlikely to be monitored adequately by the BBS but many are the subject of specific surveys and projects. However, as coverage increases, we are hopeful of collecting useful information on some of the birds mentioned, such as Hobby, Peregrine, Dunlin, Nightingale, Ring Ouzel and Pied Flycatcher. It is still interesting to look at these results; e.g. several of the 13 Red Kites were recorded close to English and Scottish release sites. Considering the amazing success of this establishment project, it won't be long before more are recorded from England than Wales. From this table, we can see that 1997 was a minor 'Quail year' with 28 records compared with just 6 the year before.

We are also conscious that there is a need to monitor non-native or escaped species and these are shown in Table 5. Some of the introductions of the past have become well-liked, familiar birds, while others have made more of a nuisance of themselves. It is the latter species we need to keep an eye on so that future problems are averted. Our intention is to record all species which are apparently living in a wild state without human assistance.

Between-year changes

The main purpose of the BBS is to monitor population changes and Table 6 shows changes for an impressive 100 species. With our fourth full year completed, we can look at the changes between 1994 and 1997. We have concentrated on the species recorded from more than 50 squares (i.e. those listed in Tables 2 and 3) since sample sizes allow sufficient precision in the results (Table 6). The table shows the percentage change in population level over two different time periods, 1996-97 and 1994-97. A change without a sign is an increase while a negative sign indicates a decrease. Those changes labelled with an asterisk are statistically significant and we can therefore be confident that a real change in population level has occurred. It is important to emphasise that it is the long-term trend which is of greater interest; the between-year changes are bound to fluctuate for some species, often driven by the weather.

Since the BBS will ultimately take over the monitoring role of the CBC, it is vital that we understand how the results from the two schemes interrelate. Once again there is good agreement between the two schemes. For example, both show significant declines among Robin, Blackbird and Lesser Whitethroat, and gains for Blackcap. Comparisons with the Constant Effort Sites ringing results are also favourable.

Table 2. Species recorded by the BBS in 1996-97 in more than 100 squares in each year. For each year the figures on the left are the number of squares a species was recorded from (n) and the figures on the right the percentage of squares with that species (%). Species in parenthesis are usually recognised as races or forms rather than full species.

Species[1]	1996		1997		Species	1996		1997	
	n	%	n	%		n	%	n	%
Cormorant	114	6	131	6	Robin	1572	82	1804	83
Grey Heron	413	22	483	22	*Redstart*	118	6	146	7
Mute Swan	150	8	169	8	Wheatear	259	14	244	11
Canada Goose	261	14	291	13	*Blackbird*	1662	87	1894	88
Shelduck	109	6	124	6	**Song Thrush**	1287	67	1389	64
Mallard	848	44	936	43	Mistle Thrush	859	45	944	44
Tufted Duck	115	6	125	6	Sedge Warbler	247	13	268	12
Sparrowhawk	227	12	272	13	Lesser Whitethroat	217	11	154	7
Buzzard	356	19	458	21	Whitethroat	966	50	1062	49
Kestrel	440	23	552	26	Garden Warbler	347	18	406	19
Red Grouse	103	5	114	5	Blackcap	831	43	1045	48
Red-legged Partridge	369	19	412	19	Chiffchaff	803	42	973	45
Grey Partridge	267	14	283	13	Willow Warbler	1193	62	1314	61
Pheasant	1136	59	1297	60	Goldcrest	455	24	524	24
Moorhen	440	23	480	22	**Spotted Flycatcher**	197	10	210	10
Coot	161	8	179	8	Long-tailed Tit	553	29	606	28
Oystercatcher	238	12	251	12	*Marsh Tit*	105	5	140	6
Lapwing	570	30	552	26	Coal Tit	510	27	559	26
Snipe	134	7	128	6	Blue Tit	1559	81	1811	84
Curlew	433	23	448	21	Great Tit	1388	72	1608	74
Black-headed Gull	421	22	477	22	Nuthatch	259	14	296	14
Common Gull	141	7	134	6	Treecreeper	270	14	290	13
Lr Black-backed Gull	379	20	447	21	Jay	434	23	532	25
Herring Gull	418	22	489	23	Magpie	1286	67	1457	67
(Feral Pigeon)	481	25	576	27	Jackdaw	1046	55	1259	58
Stock Dove	527	27	582	27	Rook	954	50	1084	50
Woodpigeon	1709	89	1925	89	(Carrion Crow)	1565	82	1798	83
Collared Dove	890	46	1050	49	(Hooded Crow)	111	6	127	6
Turtle Dove	198	10	200	9	Raven	147	8	161	7
Cuckoo	774	40	810	37	*Starling*	1383	72	1538	71
Swift	787	41	819	38	House Sparrow	1153	60	1300	60
Green Woodpecker	451	24	529	24	**Tree Sparrow**	142	7	148	7
Gt Spotted Woodpecker	518	27	593	27	Chaffinch	1673	87	1897	88
Skylark	1342	70	1488	69	Greenfinch	1174	61	1376	64
Swallow	1326	69	1508	70	*Goldfinch*	947	49	1057	49
House Martin	701	37	741	34	Siskin	116	6	131	6
Tree Pipit	120	6	118	5	**Linnet**	965	50	1104	51
Meadow Pipit	632	33	658	30	Redpoll	135	7	130	6
Yellow Wagtail	184	10	169	8	**Bullfinch**	**466**	**24**	**525**	**24**
Grey Wagtail	120	6	120	6	Yellowhammer	953	50	1104	51
Pied Wagtail	913	48	941	44	**Reed Bunting**	**334**	**17**	**337**	**16**
Wren	1608	84	1812	84	**Corn Bunting**	150	8	165	8
Dunnock	1361	71	1521	7					

Table 3. Species recorded by the BBS in 1996-97 in 51-100 squares in at least one of the years. For details see Table 2.

Species[1]	1996		1997		Species	1996		1997	
	n	%	n	%		n	%	n	%
Gt Crested Grebe	46	2	57	3	*Sand Martin*	114	6	99	5
Greylag Goose	75	4	85	4	Whinchat	93	5	89	4
Golden Plover	78	4	96	4	*Stonechat*	48	3	50	2
Redshank	74	4	59	3	*Grasshopper Warbler*	56	3	76	4
Common Sandpiper	73	4	79	4	Reed Warbler	82	4	84	4
Gt Black-backed Gull	87	5	98	5	Wood Warbler	51	3	67	3
Little Owl	85	4	114	5	*Willow Tit*	66	3	63	3
Tawny Owl	71	4	71	4	Common Crossbill	38	2	60	3

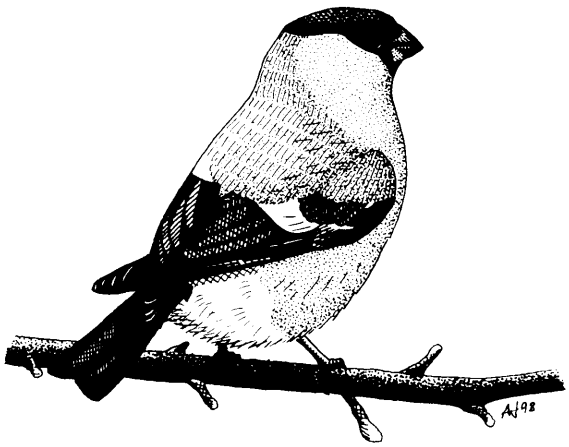
[1] Species in bold are red listed in *Birds of Conservation Concern* or within Tables 1-3 on the list of *Birds of Conservation Importance.* Species in italics are listed as amber in *Birds of Conservation Concern* or within Table 4 on the list of *Birds of Conservation Importance.*

Table 4. Species recorded by the BBS in 1996-97 in 1-50 squares in at least one of the years. The table shows the number of squares occupied in each year. Annual monitoring of these rarer species within the BBS will be limited. Species in parenthesis are usually recognised as races or forms rather than full species.

Species	*1996*	*1997*	*Species*	*1996*	*1997*	*Species*	*1996*	*1997*
Red-throated Diver	14	17	Montagu's Harrier	2	1	Little Tern	3	1
Black-throated Diver	1	4	Goshawk	7	11	Black Tern	2	0
Great Northern Diver	1	1	Golden Eagle	10	7	Guillemot	3	0
Little Grebe	43	48	Osprey	3	4	Razorbill	3	0
Black-necked Grebe	0	2	Merlin	16	22	Black Guillemot	2	2
Fulmar	17	21	Hobby	29	26	(Rock Dove)	8	9
Manx Shearwater	1	0	Peregrine	30	26	Ring-necked Parakeet	6	7
Gannet	5	5	Ptarmigan	3	2	Barn Owl	12	13
Shag	8	7	Black Grouse	9	14	Long-eared Owl	1	3
Little Egret	4	1	Capercaillie	0	1	Short-eared Owl	25	18
Spoonbill	1	0	Quail	6	28	Nightjar	0	1
Pink-footed Goose	4	7	Golden Pheasant	4	0	Kingfisher	34	48
White-fronted Goose	1	1	Water Rail	3	3	Woodlark	9	10
Snow Goose	1	1	Corncrake	1	3	Rock Pipit	12	11
Barnacle Goose	5	6	Lr Spotted Woodpecker	25	18	Waxwing	1	0
Brent Goose	5	1	Avocet	2	4	Dipper	46	42
Egyptian Goose	0	4	Stone Curlew	4	3	Nightingale	20	30
Mandarin	3	10	Little Ringed Plover	6	13	Black Redstart	0	1
Wigeon	3	10	Ringed Plover	22	22	Ring Ouzel	20	14
Gadwall	18	19	Dotterel	3	2	Fieldfare	25	30
Teal	27	19	Grey Plover	1	2	Redwing	14	7
Pintail	3	1	Sanderling	2	1	Cetti's Warbler	6	4
Garganey	1	0	Purple Sandpiper	1	0	Marsh Warbler	0	1
Shoveler	9	9	Dunlin	33	28	Dartford Warbler	3	2
Pochard	11	18	Woodcock	7	5	Pied Flycatcher	34	48
Scaup	1	1	Black-tailed Godwit	1	1	Bearded Tit	0	1
Eider	6	8	Bar-tailed Godwit	1	0	Crested Tit	2	2
Long-tailed Duck	1	0	Whimbrel	23	22	Short-toed Treecreeper	3	3
Common Scoter	1	1	Greenshank	11	19	Golden Oriole	1	1
Goldeneye	2	2	Green Sandpiper	2	4	Red-backed Shrike	0	2
Red-breasted Merganser	10	11	Turnstone	4	4	Woodchat Shrike	0	1
Goosander	32	32	Arctic Skua	10	7	Chough	2	6
Ruddy Duck	8	5	Great Skua	5	7	Brambling	4	7
Black Kite	1	0	Kittiwake	1	1	Twite	19	26
Red Kite	12	13	Sandwich Tern	4	6	Scottish Crossbill	2	5
White-tailed Eagle	0	1	Common Tern	32	45	Hawfinch	3	3
Marsh Harrier	11	7	Arctic Tern	5	9	Cirl Bunting	3	3
Hen Harrier	10	16						

Table 5. Feral or non-native species on category E of the official British list that were recorded by the BBS during 1996-97.

Species	*1996*	*1997*
Alexandrine Parakeet	1	0
Peacock	2	11
Guineafowl sp.	1	0
Reeves's Pheasant	1	1
Harris Hawk	1	1
Wood Duck	2	2
Ruddy Shelduck	1	0
Australian Shelduck	1	0
Muscovy Duck	1	1
Black Swan	1	2
Red-crested Pochard	0	1
(Feral Goose)	0	1
(Feral Aylesbury Duck)	0	2



One of our most colourful birds, the Bullfinch was recorded in 24% of all BBS squares. Falling numbers have led to the Bullfinch being listed as of high conservation concern. (Drawing by Andy Wilson).

Population changes between 1996 and 1997, and between 1994 and 1997 are presented for a total of 100 species in Table 6. In the following taxonomic sections we concentrate on the significant population changes between 1994 and 1997 because they provide a clearer picture of medium-term change. The analysis is based on the standard bird counts from BBS and so excludes the colonial nest counts that BBS observers make for Rook, Sand Martin and gulls.

Overall trends

Among the group of 100 species we are able to index using BBS, we find 30 to be increasing significantly and 18 to be decreasing significantly between 1994 and 1997. Ten of the species monitored by BBS were identified as of high conservation concern in a recent review of conservation priorities. They are Grey Partridge, Turtle Dove, Skylark, Song Thrush, Spotted Flycatcher, Tree Sparrow, Linnet, Bullfinch, Reed Bunting and Corn Bunting. The Government has recently published Biodiversity Action Plans for each of these birds. The action plans are designed, first, to identify causes of population decline and, second, to instigate remedial action to reverse the downward trends.

The BBS shows that all these birds are continuing to decline, except for the Grey Partridge that has increased (non-significantly) by 10%. Among the nine species showing population declines, only the Song Thrush and Corn Bunting declined significantly between 1994 and 1997. The time series from the BBS is still too short to draw any conclusions about trends of these and other birds, but early indications are not particularly encouraging for these species.

Grebes to Gulls

We are able to index a variety of waterbirds, waders and seabirds using BBS, but it should be borne in mind that, in many cases, their main populations and habitats are not well covered by the scheme. Numbers of Canada Goose, Buzzard, Red-legged Partridge and Common, Herring, Lesser and Greater Black-backed Gulls were all up significantly between 1994 and 1997. Population increases among the gulls were particularly pronounced. In contrast, Kestrel, Oystercatcher, Golden Plover and Redshank showed significant declines over the same period. For waders, and other migrants, counts may well be influenced by the presence of migrant individuals that breed far from where they are counted in the UK. Future analyses will attempt to overcome these problems. Table 6 shows that sample sizes for some of these species tend to be small and we have low confidence in the change measures. The contrast between the fortunes of Buzzard and Kestrel populations is striking. Buzzards appear to be benefiting from reduced persecution by gamekeepers, which is thought to have limited their populations in the past. In contrast, Kestrels, which have not suffered in the same way, have been in decline on CBC plots for some time and this may reflect a reduction in prey abundance. These changes are likely to be linked with agricultural change.

Pigeons to Woodpeckers

Over the period 1994 to 1997 two species show significant population gains, the Collared Dove and Great Spotted Woodpecker, while two show population declines, the Cuckoo and Swift. The upward trend in the numbers of Collared Doves is well documented by the CBC and it shows no signs of stopping. The increase in the numbers of Great Spotted Woodpeckers is a more recent phenomenon and is in stark contrast to the closely related Lesser Spotted Woodpecker which is in severe decline. The latter is now so rare that we struggle to monitor its numbers using BBS or CBC. The downturn in numbers of Cuckoo and Swift is curious. They are both long-distance migrants wintering in Africa, so a change in their status may tells us more about wintering than breeding conditions. Cuckoos advertise their presence by their characteristic call and are fairly easily censused for this reason. Their numbers on CBC have been stable over the last 25 years, with the suggestion of a slight decline in the last ten years. Swifts are more difficult to census; they are aerial feeders and semi-colonial, and non-breeding and breeding birds can be mixed in large flocks. The BBS is the first scheme to attempt to monitor population change in a systematic manner. Concern about falling numbers of Swift are borne out by figures from BBS. We obviously need to keep a close eye on this species in the future.

Larks to Thrushes

A total of five species increased significantly and eight declined significantly between 1994 and 1997 in this group of birds. Encouragingly, numbers of Swallow, Yellow Wagtail, Pied Wagtail, Redstart and Wheatear were all up, though confidence limits on some of these changes were large. A number of these birds are thought to have been declining in recent times so that the upturn in BBS numbers is most welcome.

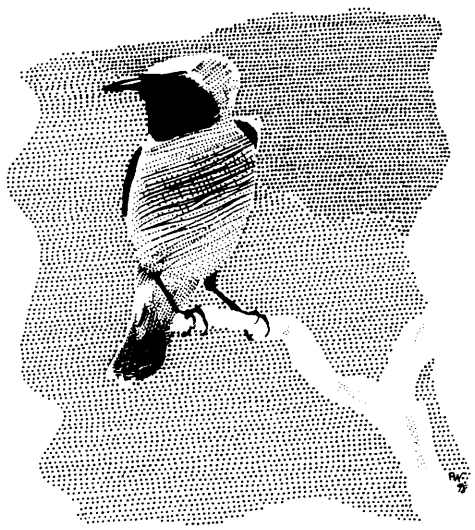
Numbers of Meadow Pipit, Grey Wagtail, Wren, Dunnock, Robin, Blackbird, Song Thrush and Mistle Thrush were all down. Many of these birds are affected by cold winter weather but recent winters have not been particularly severe and so weather doesn't provide an explanation for the declines. Declines among the three species of thrush are extremely worrying. There is a *Biodiversity Action Plan* in place for the Song Thrush and ongoing research by BTO and RSPB is improving our understanding of the causes of decline. Blackbird and Mistle Thrush, however, were given Amber and Green listing respectively at the time the *Birds of Conservation Concern* list was drawn up. The CBC now shows that their populations have declined by 33% and 34% respectively over the last 25 years. If the two species continue to decline at their present rates we will need to revise their conservation status.

Warblers to Flycatchers

Warbler populations have, in general, been increasing according to BBS data over 1994-1997. Numbers of Grasshopper Warbler, Whitethroat, Garden Warbler, Blackcap, Chiffchaff, Willow Warbler and Goldcrest were all up significantly (although sample sizes for Grasshopper Warbler were small). The numbers of Lesser Whitethroat have, however, fallen by around half over the same period. While it appears that improved wintering conditions in drought-prone areas of trans-Saharan West Africa may have benefited many of our warblers, the Lesser Whitethroat, which is unusual among our warblers in wintering in East Africa, has crashed in numbers. We can only speculate that changes perhaps on its migration route through the eastern Mediterranean, or on its wintering areas in East Africa, have driven the population decline.

Tits to Starlings

Many of the tits and their allies have been increasing in recent years according to CBC and this is reflected in the BBS results. There were significant increases in the numbers of Coal Tit, Blue Tit, Great Tit, Nuthatch and Treecreeper during 1994-97. A series of relatively mild winters coupled with good breeding seasons may be responsible for these trends. British Nuthatches have been extending their range and increasing in numbers for some time. The CBC shows that the increase



Redstarts are found mainly in our western woodlands. Through increases in the number of BBS squares covered in these areas, we have a sample size of 146 which allows us to monitor this species with some confidence. (Drawing by Peter Wilson).

How the percentage changes are calculated

Population changes were assessed using a loglinear model with Poisson error terms. We used the higher count from the early or late visit for each species on each square as our best estimate of the abundance of that species. Counts were modelled as a function of square and year effects, with counts weighted to account for the under- or over-sampling of BBS regions within the UK. Correction for under- or over-dispersion of the count data was also incorporated. Any square with two annual counts between 1994 and 1997 was included in the analysis. Note that missing data for particular years are imputed using these methods.

Table 6. Population changes of common and widespread species 1996-1997 and 1994-1997. The sample size is the average number of squares occupied each year over the period under consideration. The figures presented are percentage changes in population levels for the respective time periods. Those figures marked with an asterisk are statistically significant at the 5% level. The lower (lcl) and upper (ucl) 95% confidence limits are given for the population changes from 1994 to 1997. See box above for further details. As in Table 2 species in bold are red listed in *Birds of Conservation Concern* or within Tables 1-3 on the list of *Birds of Conservation Importance*. Species in italics are listed as amber in *Birds of Conservation Concern* or within Table 4 on the list of *Birds of Conservation Importance*.

Species	*Sample*	*Change 96-97*	*Change 94-97*	*lcl*	*ucl*	*Species*	*Sample*	*Change 96-97*	*Change 94-97*	*lcl*	*ucl*
Great Crested Grebe	49	6	-1	-28	35	Wren	1474	4	-19 *	-22	-16
Cormorant	104	10	-2	-25	26	*Dunnock*	1220	-8	-6 *	-11	-1
Grey Heron	378	-2	3	-10	18	Robin	1422	-11 *	-10 *	-13	-7
Mute Swan	132	7	-8	-24	11	*Redstart*	110	15	63 *	32	101
Greylag Goose	66	-17	30	-12	91	Whinchat	77	-21	8	-17	40
Canada Goose	224	-7	23 *	3	46	*Stonechat*	49	-37	-26	-52	15
Shelduck	97	-21	-13	-31	10	Wheatear	211	-4	35 *	17	56
Mallard	746	-1	3	-4	12	*Blackbird*	1495	-6 *	-5 *	-8	-2
Tufted Duck	101	9	3	-18	30	**Song Thrush**	1141	-17 *	-17 *	-22	-12
Sparrowhawk	219	15	-12	-27	7	Mistle Thrush	774	-6	-15 *	-22	-6
Buzzard	323	4	18 *	4	34	*Grasshopper Warbler*	50	52	112 *	41	218
Kestrel	445	6	-15 *	-25	-3	Sedge Warbler	202	-14	5	-10	22
Red Grouse	90	9	13	-9	40	Reed Warbler	70	-1	7	-16	36
Red-legged Partridge	315	-1	26 *	11	42	Lesser Whitethroat	182	-35 *	-49 *	-59	-36
Grey Partridge	217	-10	10	-8	31	Whitethroat	817	-3	23 *	15	32
Pheasant	1014	-8	0	-6	5	Garden Warbler	311	10	23 *	7	41
Moorhen	412	-13	-9	-19	2	Blackcap	794	15 *	18 *	10	26
Coot	147	-16	8	-10	29	Wood Warbler	54	47	-5	-30	28
Oystercatcher	202	-19	-42 *	-48	-35	Chiffchaff	736	6	15 *	8	24
Golden Plover	78	89 *	-42 *	-55	-25	Willow Warbler	1064	-1	15 *	10	21
Lapwing	498	2	-2	-12	8	Goldcrest	415	25 *	36 *	24	50
Snipe	113	12	1	-19	26	**Spotted Flycatcher**	170	-7	-13	-29	7
Curlew	372	-9	-7	-15	2	Long-tailed Tit	509	16	4	-8	17
Redshank	60	6	-25 *	-43	-2	*Marsh Tit*	103	-13	14	-13	49
Common Sandpiper	58	-7	-2	-26	28	*Willow Tit*	58	20	-4	-32	36
Black-headed Gull	393	16	-11	-21	0	Coal Tit	445	8	35 *	22	48
Common Gull	119	23	36 *	10	67	Blue Tit	1395	1	21 *	16	26
Lesser Black-backed Gull	336	9	45 *	27	67	Great Tit	1252	1	12 *	7	18
Herring Gull	358	-16	33 *	17	51	Nuthatch	228	1	41 *	21	64
Great Black-backed Gull	72	6	46 *	10	93	Treecreeper	230	3	32 *	10	57
Feral Pigeon	445	7	0	-11	12	Jay	422	-5	-12 *	-22	-1
Stock Dove	495	-1	8	-3	21	Magpie	1148	4	4	-1	9
Woodpigeon	1523	5	-4	-8	0	Jackdaw	951	3	8 *	1	15
Collared Dove	817	1	10 *	4	18	Rook	849	-5	5	-4	14
Turtle Dove	167	-17	-16	-31	2	Carrion Crow	1514	1	3	-3	8
Cuckoo	697	-14	-13 *	-21	-5	Raven	125	-12	12	-13	46
Little Owl	79	12	9	-20	49	*Starling*	1252	1	3	-4	9
Tawny Owl	61	-10	-18	-43	18	House Sparrow	1040	-5	-2	-6	2
Swift	728	1	-20 *	-27	-12	**Tree Sparrow**	122	-22	-13	-31	10
Green Woodpecker	415	8	1	-10	14	Chaffinch	1503	-5	1	-2	4
Great Sp. Woodpecker	454	-3	25 *	11	41	Greenfinch	1060	9	19 *	12	26
Skylark	1212	-2	-4	-8	0	*Goldfinch*	847	-6	1	-7	10
Sand Martin	80	-38	30	-3	74	Siskin	102	-4	64 *	30	108
Swallow	1160	6	10 *	4	17	**Linnet**	880	-2	-5	-12	3
House Martin	602	-4	4	-5	15	Redpoll	102	26	41 *	10	81
Tree Pipit	107	-13	-7	-25	16	Common Crossbill	35	22	-17	-44	24
Meadow Pipit	548	-8	-6 *	-11	-1	**Bullfinch**	400	-13	-2	-14	12
Yellow Wagtail	152	-13	30 *	9	55	Yellowhammer	883	-6	-12 *	-17	-7
Grey Wagtail	116	-23	-38 *	-53	-17	**Reed Bunting**	290	-3	-7	-19	6
Pied Wagtail	780	-2	12 *	3	21	**Corn Bunting**	140	-4	-21 *	-33	-6

began in the early 1970s and the *New Atlas* that expansion has been most pronounced in the north of England. Marsh and Willow Tits (both of which are in long-term decline according to CBC results), in contrast with their close relatives, remain quite rare and show no particular trend in numbers according to BBS.

Among the crows monitored by BBS, the number of Jays was down and the number of Jackdaws was up; the rest of the species show non-significant trends have been stable.

Sparrows to Buntings

The House Sparrow for which the CBC and Garden Bird Feeding Survey suggest a substantial long-term decline over the last 25 years, has hardly changed in numbers on BBS. The numbers of Greenfinch, Siskin and Redpoll have increased over the period 1994-97, although sample sizes for the last two remain quite small. In contrast, Yellowhammer and Corn Bunting populations have both declined significantly over the same period. The Yellowhammer appears to be going the way of other seed-eating birds of farmland. Its population had been stable according to CBC up until the early 1990s but has been declining rapidly ever since. At the time the *Birds of Conservation Concern* list was drawn up, Yellowhammer populations were considered to be secure; recent events show that this is no longer the case. The position of the Corn Bunting is equally precarious, if not more so as the BBS shows a relatively large decline from 1994 to 1997 and this is on top of sustained declines from the early 1970s. Research by BTO and other organisations has investigated the causes of decline for this species and a *Biodiversity Action Plan* has just been published in an attempt to reverse the downward trend. Farmland birds as a whole appear to be faring worse than their counterparts in other habitats.

Habitat coverage

Habitat change through time is almost always linked to changes in bird populations for better or for worse. By monitoring the habitat on each square we are able not only to keep an eye on these changes but to identify key habitat elements for each species. Figure 2 details the habitat breakdown recorded within the BBS. These figures are unlikely to change much annually.

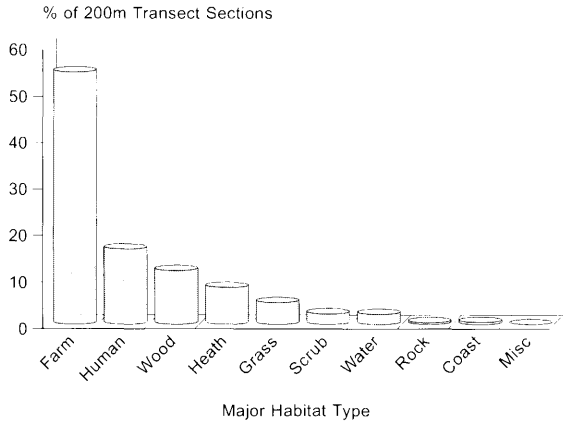


Figure 2. Overall habitat coverage in the BBS in 1997. The histogram shows the percentage (%) of 200 m transect sections falling into the major categories. Unlike bird population changes presented, these figures have not been corrected for the distribution of BBS effort so that they do not represent the proportions of these habitats in the UK as a whole.

Mammals

During the third year of mammal recording, 86% of all BBS returns supplied data for mammals. This tremendous effort provides invaluable data at little extra effort to BBS fieldworkers. The 177 squares (10%) recording no mammals also provide essential information.

Forty species were recorded in 1997 including Chinese Water Deer in Norfolk and Common Dormouse in Kent. One observer even recorded Prairie Dog which had set up home in a field outside the confines of its zoo enclosure! Mammal recording doesn't attempt to monitor all species just as BBS doesn't attempt to monitor all breeding birds. Obviously the natural history of some mammals makes them very difficult to detect. However, some species like Mole or Badger do reveal their presence through signs. BBS mammal recording is able to note presence or absence of our common or obvious mammals, which allows their distribution to be mapped. Considering the lack of systematic mammal data collection presently undertaken in the UK, these data are of significant value.

Table 7. Mammal recording within the BBS 1997. The table shows the number (n) and percentage (%) of squares occupied for the 15 most widespread species.

Mammal	*n*	%
Rabbit	1291	69
Brown Hare	648	39
Grey Squirrel	598	32
Red Fox	474	25
Roe Deer	296	16
Mole	290	16
Hedgehog	162	9
Badger	155	8
Red Deer	101	5
Common Shrew	89	5
Stoat	86	5
Brown Rat	76	4
Weasel	71	4
Muntjac Deer	67	4
Fallow Deer	64	3

Tips to volunteers

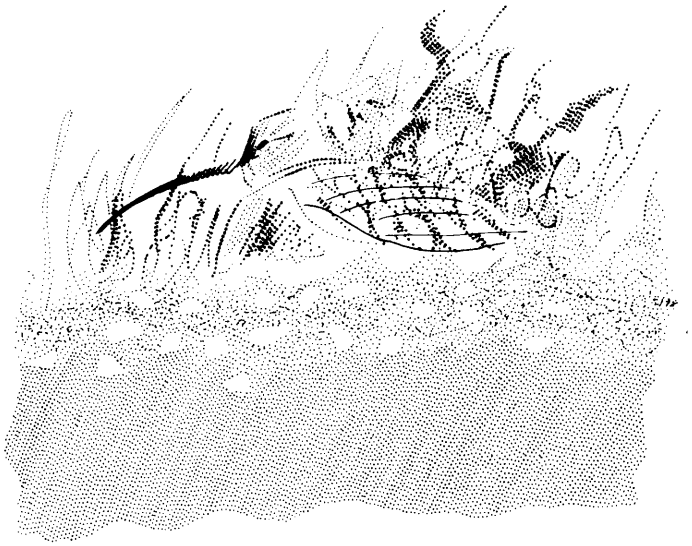
Habitat recording - extra guidelines

The BTO habitat coding system may not be everyone's favourite part of the BBS but by providing a detailed description of the habitat in each square we are able to undertake important studies of bird-habitat relationships and, in particular, assess how changes in habitat affect bird populations. This information is vital if your data are to be of maximum use for conservation.

Last year we provided some extra guidelines on habitat recording which we hope answered some queries. This year we have again updated the form, in an attempt to reduce the number of errors. However, there are still some quite common problems which occur on several forms. For example, it is important to ensure that only one letter or number is entered in each box. In levels three and four, numerical values can go up to 15. It is important that numbers from 10 to 15 are entered into one box rather than across two. Sometimes, only one entry is needed in levels three and four. If this is the case, please leave the other box blank or insert a dash.

Birds in flight - extra guidelines

Participants in the BBS will be aware that we ask for birds to be recorded in one of three distance categories. This helps us to understand the differences in the detectability of birds within habitats and allows population densities to be estimated. There is also a category for 'birds in flight' which is designed to be used for birds flying over the square. It is important to separate these birds from those genuinely living in the square. For instance, a Lesser Black-backed Gull flying high over your square should be recorded in the flight category whereas a Greenfinch flying over and landing in a tree 50 metres away should be entered into distance category 2. In fact, most small birds should be in a distance category rather than in flight, except if they are seen to fly over and do not land. Birds such as hirundines, Swifts and others which are most often recorded in the flight category are obviously treated differently during analysis. The Skylark is a special case because we would like birds in song-flight to be recorded in the appropriate distance band from the transect line rather than as in flight.



The fact that the BBS recorded Curlews in 448 squares is evidence that the survey is successfully reaching upland areas where the majority of this species breeds. (Drawing by Peter Wilson).

Mammal recording

Please remember that we do need nil returns, i.e. forms with completed header information and marked 'N' in the box provided to tell us that you detected no mammals. Blank mammal forms not marked 'N' cannot be used.

Late forms

The late receipt of forms continues to be a problem in a few cases. The sooner we have the data the sooner we are able to produce the BBS report and provide feedback to volunteers. Late data are always of course welcome but, depending on when they are received, they may not be incorporated in the most recent annual report.

FOCUS

Scotland

Our coverage in Scotland has been increasing steadily since the scheme began. With 312 squares covered in 1997 we are able to look at Scottish population changes for many common species. Previous BTO monitoring has been largely restricted to the south and the east of the UK and we have been less confident with the data from the north and west. Although the BBS offers us the facility of analysing results from particular countries or regions, we must remember that, with just four years' data, it is still too early to identify population trends with great confidence particularly where the sample sizes are so small.

Of the Scottish squares covered in 1997, 48 were surveyed by RSPB professional fieldworkers, mainly in Highland Region. There are encouraging numbers of squares covered in many parts of Scotland but we are still reliant on professional help in the more remote regions. We are, however, keen to hear from volunteers wherever they are in Scotland. With 50% of issued squares covered, there are plenty spare.

For the UK, more species showed increases than decreases. This is also the case in Scotland with 10 significantly up and 7 significantly down. Concentrating on species showing significant changes in Scotland, most show results similar to those from the UK. Buzzard shows encouraging gains in both change tables suggesting that persecution is declining across the UK. Both tables show a decrease in Swift, a species which we are increasingly concerned about. The trend in Swallows is quite different with a 10% increase in the UK but a 22% decrease Scotland. This perhaps indicates a north-south difference in trends and we must remain vigilant. This also emphasises one of the strengths of the BBS, which is that we can look at regional trends that we have never been able to estimate in the past. Variation of this kind is particularly useful because it can shed light on the causes of population declines. A good proportion of all Wheatears recorded were in Scotland. The BBS results for this species suggest that it is doing fairly well in the UK and Scotland with increases of 35% and 58% respectively. Previous surveys have not been able to monitor this species and we hope that this is one of several in the north and west for which we can now produce trends. Recent research on Song Thrushes has highlighted their serious decline. This work has shown that related species such as Blackbird and Mistle Thrush have also declined. This also appears to be the case in Scotland but it will be interesting to see whether any differences in trends emerge over time. Scottish samples sizes of several passerines would suggest that we can be fairly confident in the emerging trends. Willow Warbler, Goldcrest, and Coal and Blue Tit all show gains which mirror UK increases. Whilst this is also true of Chaffinch, Linnet appears to be doing fairly well in Scotland compared with a slight decrease in the UK. Differences in these change figures will perhaps point towards important factors in the decline or otherwise of these species, which will in turn help us identify conservation measures.

Table 8: Population changes of common and widespread species in Scotland 1994-1997. As in Table 6, those species marked with an asterisk are statistically significant at the 5% level. Only species with a sample size more than twenty are included. Bold = Red listed, Italics = Amber listed.

Species	*Sample*	*Change 94-97*		*lcl*	*ucl*
Mallard	74	12		-15	47
Buzzard	77	36	*	3	81
Red Grouse	57	9		-20	49
Pheasant	90	-20	*	-35	-3
Oystercatcher	109	-48	*	-56	-40
Golden Plover	51	-25		-45	2
Lapwing	83	-18		-33	1
Snipe	55	7		-24	51
Curlew	120	-11		-25	6
Black-headed Gull	72	-39	*	-54	-20
Common Gull	68	14		-13	49
Lesser Black-backed Gull	55	95	*	42	168
Herring Gull	90	38	*	5	82
Feral Pigeon	50	12		-22	63
Wood Pigeon	141	-18	*	-29	-6
Collared Dove	31	-27		-52	11
Cuckoo	67	7		-24	51
Swift	34	-48	*	-68	-16
Skylark	187	10		-1	24
Swallow	112	-22	*	-37	-4
Meadow Pipit	202	-4		-12	6
Pied Wagtail	106	11		-11	37
Wren	161	7		-7	24
Dunnock	82	8		-17	40
Robin	138	-15		-28	0
Wheatear	74	58	*	24	102
Blackbird	128	-20	*	-31	-8
Song Thrush	115	-8		-26	15
Mistle Thrush	52	-16		-43	26
Willow Warbler	167	48	*	30	69
Goldcrest	67	53	*	18	98
Coal Tit	98	51	*	23	86
Blue Tit	103	31	*	4	63
Great Tit	88	24		-4	60
Jackdaw	79	7		-14	35
Rook	90	15		-15	56
Carrion Crow	188	-9		-24	10
Raven	37	-4		-43	59
Starling	105	16		-14	57
House Sparrow	63	-7		-23	14
Chaffinch	181	15	*	4	27
Greenfinch	67	26		-4	66
Siskin	59	34		-7	93
Linnet	67	65	*	21	125
Yellowhammer	75	-6		-24	16

Habitat use by sparrows, finches and buntings

A recent piece of BBS research focused on habitat use of ten species of sparrows, finches and buntings. The birds chosen were House Sparrow, Tree Sparrow, Chaffinch, Greenfinch, Goldfinch, Linnet, Bullfinch, Yellowhammer, Reed Bunting and Corn Bunting. All are well represented in the BBS data, although the number of squares with Tree Sparrow or Corn Bunting is rather small. Many, but not all, of these birds have declined in numbers over the last twenty-five years, particularly on farmland. Our study was motivated by a need to understand how they use farmland and other habitats in Britain and why some birds have been affected more severely than others.

Using BBS bird and habitat data from 1996 we were able to estimate the area of different habitats and the average densities of birds, and thus work out how populations are distributed across British habitats. This was only possible because BBS volunteers have diligently recorded habitat details and recorded birds in distance bands.

Unsurprisingly, farmland held greater than 50% of the British population of six species, reflecting the predominance of this land use across Britain. Farmland specialists included Tree Sparrow, Yellowhammer and Corn Bunting. Substantial proportions of other species occurred outside farmland, but different birds had different preferences. Bullfinch and Chaffinch occurred mostly on farmland and in woodland, House Sparrow, Greenfinch and Goldfinch occurred on farmland and in built-up areas, and Reed Bunting occurred on farmland and in marshland.

Interestingly, those birds which were more reliant on farmland have declined more steeply than those that were less so. Thus the farmland environment has become a much poorer place for these seed-eating birds, almost certainly as a result of agricultural intensification.

In terms of the conservation of these birds, the sympathetic management of farmland would appear to be the single most important action that could be taken if we are to reverse the downward trends. However, since large parts of their populations occur on other specific habitats, we need to ensure that they are preserved and managed in an appropriate fashion. Some species utilise woodland, some marshland and, perhaps surprisingly, some are closely associated with human settlement and activity. All these different environments are important to particular birds and we need to keep this in mind when considering bird conservation in the wider countryside.

The BBS Steering Group

Representatives from the BTO, JNCC, RSPB meet annually to discuss the progress and development of the BBS. In the first few years of a new scheme such as this, it is important that all funding bodies are involved with development of analysis and informed of survey coverage, future promotion and targets. As the scheme progresses and another new set of results is analysed, population trends start to emerge and the results become more meaningful. The BBS Steering Group meets to decide how best to focus BBS research and, in the light of previous years' experience, what guidelines we need to pass on to volunteers or how the survey could be fine-tuned.

The Countryside Bird Survey in Ireland

In January 1998, Richard Gregory and Richard Bashford travelled to Ireland to run a workshop attended by representatives from BirdWatch Ireland and the National Parks and Wildlife Service. This event preceded the launch of the Countryside Bird Survey (CBS), a new scheme which follows the BBS methodology in the Republic of Ireland. The people attending the workshop subsequently held further training workshops for CBS volunteers across Ireland. Because the CBS and BBS use the same method we will be able to merge data from the two schemes to produce an all-Ireland index as well as overall trends for the UK and the Republic of Ireland. Early indications are that things are going very well and as many as 300 1km squares were expected to be covered in 1998.

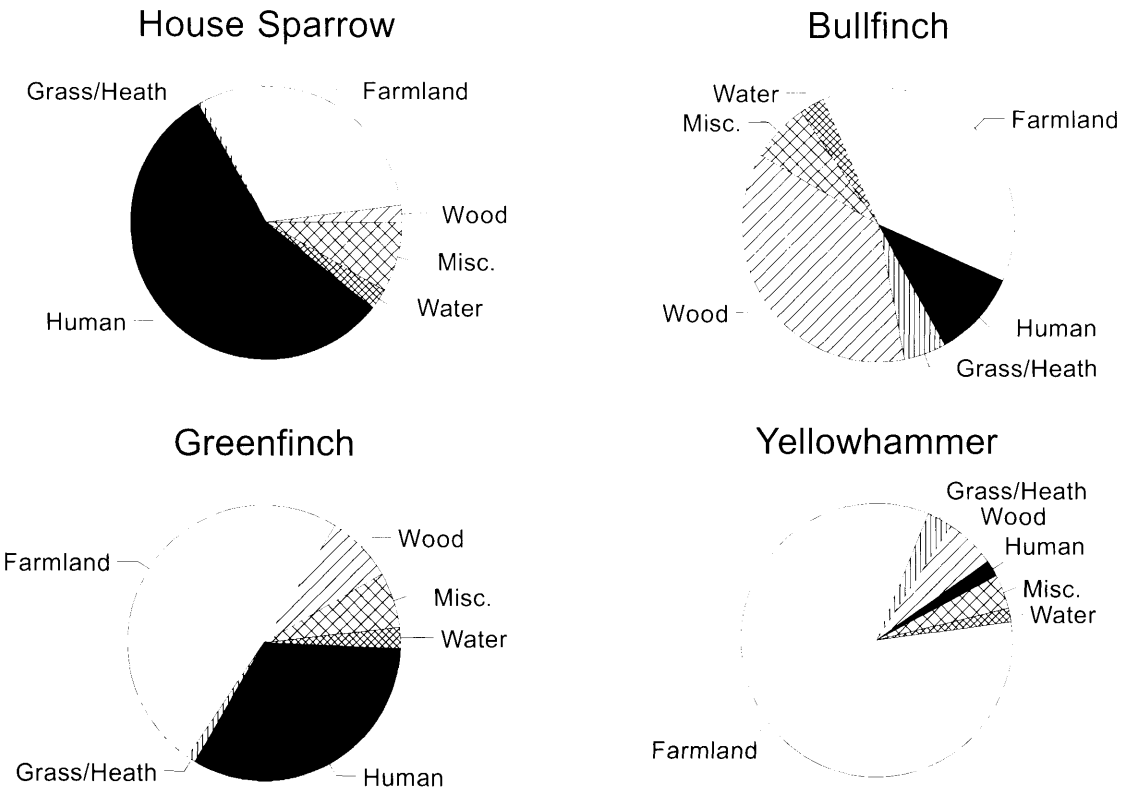


Figure3. The pie charts show the proportion of British populations of House Sparrows, Bullfinches, Greenfinches and Yellowhammers occurring in different habitat types. The House Sparrow is clearly reliant on human habitation, the Bullfinch on both farmland and woodland, the Greenfinch on both farmland and human sites, and the Yellowhammer is a farmland specialist. The BBS data are unique in allowing us to make robust estimates of how many birds of each species occur in different habitats.

The BBS and conservation

A very substantial part of the funding for the BBS comes from conservation organisations, both governmental - via the JNCC - and non-governmental, from the RSPB. The pots of money from which these funds come are not large, and only high priority work gets funded. All BBS partners agree that BBS data, and the long-term trends that they will produce, are very valuable indeed. Conservation priorities are often based on simple assessments, such as population size and trend, or the habitats occupied by declining species. Once the BBS has been in operation for a few more years it will be pivotal in helping set these priorities. Even in the absence of long-term trends, however, BBS can still be used for conservation purposes.

The Song Thrush, for example, is a species which is causing some concern as it has been in long-term decline. The CBC was unable to tell us in any quantitative way about habitat use and preference of the Song Thrush. Because of its sampling design, however, the BBS can do this and it tells us that about a quarter of all Song Thrushes are found on human sites - many probably in gardens. This new information will help guide conservation initiatives for the Song Thrush.

With a few exceptions, traditional methods of estimating bird population sizes are beset with problems, yet population estimates are one of the most commonly used results of bird surveys and monitoring. Because of the clever way in which BBS data are collected in the field (in separate distance bands) and because of the sampling design, BBS data can be used to generate robust population estimates. From the BBS we now know, for example, that there are many more Starlings in the UK than was previously thought to be the case. Once a few teething problems have been fixed, it is likely that BBS will be used to generate populations sizes for many breeding birds.

The BBS is not only a national scheme, it is also a method in its own right. The BBS method is being increasingly promoted for use in site-based survey work. Over the last two years at least six Environmentally Sensitive Areas (ESAs - five in Wales, one in England) have been comprehensively surveyed by the RSPB (in partnership with EN and the European Agriculture Guidance and Guarantee Fund) using the BBS method. Once again, the real interest will come in a few years when the surveys will be repeated, and population trends of birds on and off ESA agreement land can be compared. Even in the absence of this, however, BBS has been used to estimate sizes of bird populations on each ESA and to set these in a national context, thus highlighting their importance to birds. The BBS can (and will) be used to determine the success (or failure) of numerous environmental schemes and initiatives.

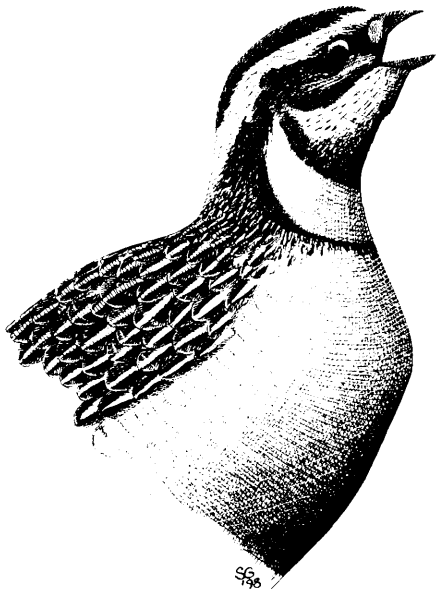
The success of the BBS is such that it is being adopted outside the UK, often in countries which previously had no common bird monitoring at all - the conservation gain of this is enormous. New schemes have started, or may soon start, in the Republic of Ireland (see page 14), Spain, Hungary and possibly Poland; the latter three RSPB-funded and run in partnership with BirdLife Partners and others in each country. Some of these schemes are direct mimics of BBS, others are developed along similar lines. In every case, however, the knowledge gained during the BBS has been invaluable in setting up the new scheme. The casual observer could be forgiven for thinking that the recording forms used by the Spanish scheme (SACRE) are the same as those used for the UK BBS. They are not, but the existence of UK BBS methods, instructions and recording forms allowed the Spanish scheme to develop much more quickly than otherwise would have been the case.

The conservation uses of BBS and its data will grow with the scheme. In a decade we will wonder how we managed without it.

Contributed by Dr David Gibbons (Head of Monitoring, RSPB)

The future

The long-term aim of the BBS is to achieve coverage of 2-3000 squares each year. This ambitious target seems much nearer thanks to the increases during the 1997 season. As each year passes, more and more regions are finding volunteers and minor problems which may have held back other regions are gradually being sorted out. We realise that over the next few years the level of coverage will stabilise, but we are still hopeful of increases in several areas. Of particular importance are the numbers of squares we can get covered in individual countries. You will see on page 13 that there are now enough squares in Scotland to allow us to look at population changes for many Scottish species for the first time. With the continuing increases in coverage, we hope to be able to do this for Wales and Northern Ireland as well.



BBS volunteers recorded Quails in 28 squares in 1997 compared with only six the year before. This suggests that 1997 was a 'Quail-Year' and proves that even the most unpromising square can turn up a real surprise. (Drawing by Simon Gillings).

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 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.

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 like especially to thank the ROs for their efforts. ROs at the time of writing are:

BBS Regional Organisers

ENGLAND: Avon - John Tully; Bedfordshire - Phil Cannings; Berkshire - Chris Robinson; Birmingham & West Midlands -Jim Winsper; Buckinghamshire - David Hughes; Cambridgeshire - Roger Clarke; Cheshire (mid) - Paul Miller; Cheshire (north & east) - Clive Richards; Cheshire (south) - Charles Hull; Cleveland - Russell McAndrew; Cornwall - Matt Southam; Cumbria (north) - John Callion; Cumbria (south) - Ian Kinley; Derbyshire (north) - Oly Biddulph; Derbyshire (south) - Dave Budworth; Devon - John Woodland (temporary cover); Dorset - Ray Broad; Durham - David Sowerbutts; Essex (north-east) - Peter Dwyer; Essex (north-west) - Geoff Gibbs; Essex (south) - Jean Stone; Gloucestershire - Rob Purveur; Hampshire - Glynne Evans; Herefordshire - Steve Coney; Hertfordshire - Chris Dee; Huntingdon & Peterborough - Bob Titman; Kent - Geoffrey Munns; Lancashire (east) - Tony Cooper; Lancashire (north-west) - Dave Sharpe; Lancashire (south) - David Jackson; Leicestershire & Rutland - Jim Graham; Lincolnshire (east) - Rob Watson; Lincolnshire (north) - Ian Shepherd; Lincolnshire (south) - Richard and Kay Heath; Lincolnshire (west) - Peter Overton; London & Middlesex - Derek Coleman; Manchester - Judith Smith; Merseyside - David Glasson; Norfolk (north-east) - Moss Taylor; Norfolk (north-west) - Mike Barrett; Norfolk (south-east) - Paul Gallant; Norfolk (south-west) - Vincent Matthews; Northamptonshire - Phil Richardson; Northumberland - Tom and Muriel Cadwallender; Nottinghamshire - Lynda Milner; Oxfordshire (north) - Roger Evans; Oxfordshire (south) - Peter Abbott; Rugby - David Porter; Shropshire - Allan Dawes; Isles of Scilly - Will Wagstaff; Somerset - Eve Tigwell; Staffordshire (central) - Frank Gribble; Staffordshire (north) - Alan Hancock; Staffordshire (south) - Peter Dedicoat; Suffolk - Mick Wright; Surrey - Hugh Evans; Sussex - John Tranter; Warwickshire - Joe Hardman; Isle of Wight - James Gloyn; Wiltshire (north) - Richard Williams; Wiltshire (south) - Andrew Carter; Wirral - Kelvin Britton; Worcestershire - Harry Green; Yorkshire (north-west) - Malcolm Priestley; Yorkshire (north) - John Edwards; Yorkshire (Harrogate) - Mike Brown; **Yorkshire (East) - vacant**; Yorkshire (north-east) - Peter Ottaway; Yorkshire (Bradford) - Mike Denton; Yorkshire (York) - Peter Hutchinson; Yorkshire (Leeds & Wakefield) - Peter Smale; Yorkshire (south-east & south-west) - Chris Falshaw. **ISLE OF MAN**: Pat Cullen. **SCOTLAND**: Aberdeen (north) - Paul Doyle; Aberdeen (south) - Graham Cooper; Angus - Ken Slater; **Argyll (north & Mull) - vacant**; **Argyll (south) - vacant**; **Arran - vacant**; **Ayrshire - vacant**; Benbecula & The Uists - Paul Boyer; Borders - Alex Copland; Caithness - Dave Butterfield (temporary cover); Central Scotland - Neil Bielby; Dumfries - Richard Mearns; Fife & Kinross - Norman Elkins; Inverness - Hugh Insley; Islay, Jura & Colonsay - Malcolm Ogilvie; **Kirkcudbright - vacant**; Lanark, Renfrew & Dunbarton - John Simpson; Lewis & Harris - Tony Pendle; Lothian - George Smith; Moray & Nairn - Bob Proctor; Orkney - Colin Corse; Perthshire - Bobby Sommerville; Ross-shire - Andrew Ramsay; Shetland - Dave Okill; Skye - Roger and Pat Cottis; Small isles (Rum, Eigg, Muck, Canna) - Bob Swann; Sutherland - Dave Butterfield (temporary cover); Wigtown - Geoff Sheppard. **WALES**: Anglesey - Jim Clark; Caernarfon - John Barnes; Brecon - John Lloyd; Cardigan - Wendy Oliver; Carmarthen - Julian Friese; Clwyd (east) - Andrew Gouldstone; Clwyd (west) - Peter Wellington; Glamorgan (west) - Dave Hanford; Glamorgan (mid and south) - Rob Nottage; Gwent - Jerry Lewis; Merioneth - Peter Haveland; Montgomery - Brayton Holt; Pembrokeshire - Graham Rees; Radnorshire - Pete Jennings. **CHANNEL ISLANDS** - Ian Buxton. **NORTHERN IRELAND: Co Antrim - vacant**; Co Armagh - David Knight; Co Down - Alistair McIlwain; Co Fermanagh/Tyrone (south) -Phil Grosse; Co Londonderry - Seamus Burns; Co Tyrone (north) - Mary Mooney.

Many thanks also to the following ROs who have retired during the last year and contributed significantly in developing BBS in their respective regions: Maurice Adcock, Geoff Carr, Syd Cochrane, Joan Howie, Roy Leigh, Mike Madders, Alistair Pout, Michael Pritchard, Mike Robb, Malcolm Ross, Stephanie Tyler and Barrie Watson.

Coverage in areas without a Regional Organiser (in bold) is co-ordinated from the Census Unit. Please contact Richard Bashford in the Census Unit if you would be able to take on the role of Regional Organiser in any of these regions.

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