The Breeding Bird Survey 1994-1995

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Report Number 1

by

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With the assistance of

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BREEDING BIRD SURVEY

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This report is provided free to all BBS counters, none of whom receive financial rewards for their invaluable work.

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This is the first Breeding Bird Survey (BBS) Annual Report covering the years 1994 and 1995. The data contained within have been collected almost entirely by the efforts of nearly 2000 volunteer ornithologists without whom, the BBS would not be possible. This report, and those to follow, are testament to the generous efforts of highly skilled volunteers. We would also like to thank members of RSPB staff in Scotland for their assistance in carrying out professional fieldwork in remote areas.

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

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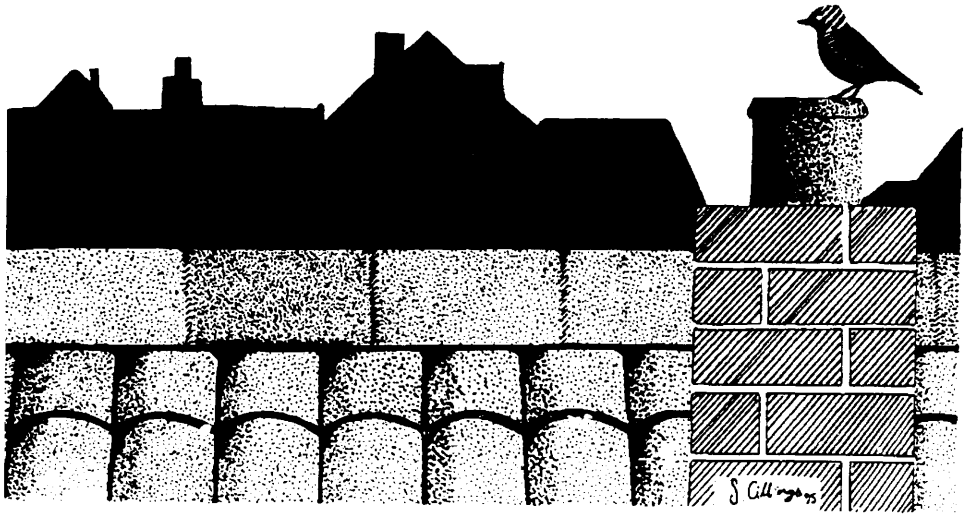
The maps of coverage and distribution were produced using DMAP which was written by Dr Alan Morton. The cover illustration and BBS logo are by Andrew Wilson. Other illustrations in this report are by the late Crispin Fisher, Simon Gillings, David Thelwell and Rob Hume. Report production is by Nicki Read.

Dedication

The first issue of the BBS report is dedicated to Dr Steve Carter, the first national organiser of the scheme, who died on 21 September 1995.



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INTRODUCTION

The need to monitor wildlife populations has arguably never been so great, with large-scale changes in farming practices and new human development increasingly evident all across the UK. Effective bird conservation would simply not be possible if there were no monitoring programmes to tell us how population levels are changing and, ideally, to provide pointers as to why these changes are taking place. Monitoring birds, as opposed to other elements of our wildlife, has the added advantage that birds can act as a valuable barometer of the health of the wider countryside. The BTO has been at the forefront of bird monitoring work since it was formed and has an international reputation in this area.

Against this backcloth the Breeding Bird Survey (BBS) was introduced in the breeding season of 1994 as an annual survey of widespread and abundant landbirds across the UK. The three BBS partners are the British Trust for Ornithology, the Joint Nature Conservation Committee (on behalf of English Nature, Scottish Natural Heritage, Countryside Council for Wales and the Department of the Environment for Northern Ireland) and the Royal Society for the Protection of Birds. This exciting new partnership demonstrates our shared interests in wildlife monitoring, in which each organisation makes a unique and valuable contribution. The BBS complements the annual monitoring of rare breeding birds, waterbirds, and seabirds that is carried out by a number of different UK organisations and partnerships.

This is the first annual report of the BBS and is designed to inform birdwatchers, especially survey volunteers and organisers, of progress and of future plans. It will also provide a valuable source of information for conservation practitioners and policy makers who are interested in the results of the survey. Here we describe the background to the scheme's introduction and population change between 1994 and 1995.

Previous monitoring

The Common Birds Census (CBC) and Waterways Bird Survey (WBS) have been the main monitoring tools for common birds in the UK over the last 35 years. Both are 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. They return their survey maps to BTO HQ where the position and number of bird territories are assessed by trained staff.

These schemes have proved highly valuable in revealing population fluctuations among British birds and helping to understand their causes. CBC data have played a key role in drawing up the new listings of *Birds of Conservation Concern,* in which a number of relatively common birds are now listed as of high conservation concern, including Grey Partridge, Turtle Dove, Skylark, Song Thrush, Spotted Flycatcher, Tree Sparrow, Linnet, Bullfinch, Reed Bunting and Corn Bunting. The predominance of farmland birds on this list is striking. The numbers of all these birds have fallen by more than 50% in the last 25 years. Quite why these changes have occurred remains open to debate but changes in farming practice seem most likely to be responsible. Our findings have stimulated related research and specific action plans designed to help these birds recover. CBC data have also contributed to the Government's Biodiversity Action Plans for the UK.

Few monitoring programmes can compare with the quality and duration of the CBC and WBS. Long-term information of this kind is extremely rare and valuable for that reason. Despite the considerable achievements of the schemes, however, 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 being concentrated in the south and east.
- Only farmland, woodland and riparian habitats are represented.
- Because observers choose areas they wish to census, bird populations in the sample may not be representative of UK bird populations as a whole.
- Relatively few plots can be covered in total (approximately 200 CBC and 100 WBS plots) because of the time-consuming nature of the fieldwork and analysis required by the mapping method.

It is vital that we continue the CBC in parallel with BBS for some time so that the results from the two can be properly calibrated.

Survey development

We have been exploring alternative ways of monitoring common birds for some time. Before embarking on a new survey scheme it was essential that the alternatives were properly assessed. This involved a number of field- and desk-based studies dating back to the late 1980s. There are two obvious alternatives to territory mapping for wide-scale bird monitoring and these are line or point count transects. All three methods are used for this purpose in other European countries and in North America.

First, we tested whether point counts carried out on CBC plots were able to measure population changes among birds in the same way as CBC mapping. The answer was that they could - simply making two point counts per year on a CBC plot produced measures of population change that were similar to CBC, but with a great saving in time for the volunteer. While point counts provided a reliable overall picture of bird populations, they did not provide information at the individual plot level that was comparable with CBC. This showed us that alternative survey methods were feasible and that as few as two site visits per year were acceptable for monitoring purposes, provided that the number of sites covered was relatively large. In fact, we estimated that at least one thousand sites would need to be covered by point counts for monitoring to be on a par with the CBC.

As a continuation of these trials, the Pilot Census Project (PCP) tested line and point count transects in 1992-93. The aim was to develop a quick, simple and enjoyable survey method that would appeal to a wide range of birdwatchers across the UK. Indeed, the response of volunteers formed a vital part of the project and shaped how it was to develop. The sampling unit chosen was the 1x1 km square of the National Grid. The position of a square can be easily defined by a grid reference and each usually contains a large enough variety of birds to be of interest to a birdwatcher, without being unworkable. Squares were chosen as a random sample and assigned to a suitable volunteer by Regional Organisers, who in the main were BTO Regional Representatives.

Two morning bird counts were completed each year using each of the two methods so that they could be compared. Two one-kilometre transects were set up in each square. One counting method involved line transects, the other five-minute point counts linked by line transect sections. Birds were recorded on specially designed forms and in distance bands from the transect line when first detected. Observers needed to assess in which distance band (0-25m, 25-100m, 100m or more) each bird occurred. Volunteers also recorded the sorts of habitats along their transects using special codes.

The PCP broke ground in testing a number of new approaches to extensive survey work in the UK. These included choosing sites randomly, using 1x1 km squares as survey units, recording birds in distance bands, and recording habitat in detail. It was very well supported

and provided valuable results. We showed that the line and point count transects produced similar measures of population change across species. Line transects were marginally more precise, required slightly less time to complete, recorded more birds per unit time, and also tended to be favoured by volunteers - but there was little to choose between the two methods. Our conclusion, bearing in mind that the BBS was to cover a wide variety of habitats across the UK, was that the line transect method was the more suitable.

The PCP also confirmed that carrying out just two bird counts per year (using either line or point count transects), produced measures of population changes that were comparable with those from the CBC. All the indications were that two visits would be adequate to measure changes in bird numbers. Furthermore, the smaller time input per year meant that we could involve many more birdwatchers and thus spread the geographical range of our monitoring.

The final issue to be resolved was the sampling design, that is, how to set about choosing the survey squares. It was immediately clear that some kind of formal sampling strategy would be necessary to assess population changes in a statistically rigorous manner. This is the only way to guarantee that our monitoring results are representative and without it our findings would always be open to question. A desk-based study tested different ways of selecting survey squares, including sampling at random, sampling on a regular grid, and sampling by landscape type.

Overall, species coverage was similar for each of the different sampling strategies in our trials. Perhaps surprisingly, choosing squares by landscape type, either choosing squares in proportion to their occurrence in UK, or taking the same number of squares from each landscape type, did not significantly increase the number of species we were able to cover. This was probably because these strategies were not able to target specialised habitats like lowland heaths or reedbeds. Since we know that volunteers are unevenly spread across the UK, with most people living in the south and east, we chose to select larger numbers of squares where there were more volunteers. In doing so we ensure adequate coverage in all areas, while allowing many people to be involved in well-populated ones. We concluded that the selection of BBS squares should be based on random sampling with the number of squares in each region proportional to observer density. This is the sampling strategy used by BBS.

Aims of the BBS

Our reasons for setting up the BBS were:

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

The BBS will 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. A primary objective will be to identify rapidly declining species that require conservation action and, in combination with other data from the BTO's Integrated Population Monitoring Programme, to provide pointers as to the causes of population changes. The parallel recording of birds and land use within the BBS will facilitate a much better understanding of the factors responsible for population changes. This will be of particular importance for birds in serious decline.

In a wider context, the BBS aims to promote a greater understanding of the population biology of British 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.

The broader aims of the BBS are to provide:

- Population trends, for as many species as possible, for the UK as a whole - such information is essential for bird conservation at a national level.
- Species population trends for individual countries within UK. Information is required by the three country agencies (English Nature, Scottish Natural Heritage and the Countryside Council for Wales) and by the Department of the Environment for Northern Ireland.
- Population trends for European Union (EU) regions within the UK. The EU Birds Directive is a key piece of legislation in relation to international bird conservation.
- Population 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. In most cases, these are standard BTO regions, but we have linked a few smaller regions 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. Note that this does not introduce bias in our results because the analysis takes account of differences in sampling intensity between regions.

For the reasons described above, BBS methods require relatively large sample sizes. In the first year of the BBS, we aimed to cover one thousand 1x1 km squares and we intend this figure to rise to between two and three thousand squares in the next few years.

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 details.
- Two morning visits are made to count birds of all species seen or heard. Birds are recorded individually in one of three distance categories or as in flight.
- Fieldwork is co-ordinated 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. 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 200m sections, and birds and habitats are recorded within these units. Habitat type and land use are recorded annually on a habitat form. This form describes the habitat surveyed along the actual route and also along the 'ideal' transect if it is different. By recording the ideal route we are able to assess whether the deviations observers necessarily make have the effect of over- or under-representing habitats within their squares.

All the survey forms were designed so that the data can be readily computerised. For example, codes for species names, county, weather conditions and habitat allow detailed information to be input efficiently. Observers choose appropriate habitat codes from an established system which is common to a range of BTO schemes.

Habitat information is essential in 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.

Count visits are timed so that the first is in the first half of the breeding season and the second in the second half. It is recommended that visits should be at least four weeks apart. Volunteers are asked to begin their counts between 6am and 7am so that they coincide with maximum bird activity, but avoid the concentrated song activity at dawn. Volunteers record all the birds they see or hear as they walk methodically along their transect routes. Observers are encouraged to pause, listen and scan for birds as they walk along their transects. Birds are noted in three distance categories (within 25m, 25-100m, or over 100m either side of the line) measured at right angles to the transect line, or as in flight. Recording birds in distance bands is important because it gives a measure of bird detectability in different habitats and allows population density to be estimated. The average time observers spend per visit is around 90 minutes.

Birds are noted on specially designed forms using the two-letter species codes that were pioneered by the CBC. Observers are encouraged to transfer the field records onto summary forms as soon after the fieldwork as is convenient. Header information on both forms includes the observer's name, address and telephone number, the square reference, county code, date, whether the bird count was the early or the late one in the season, weather conditions, and the starting and finishing times of the two halves of the transect. Counties are recorded using 4-letter codes which are standard across BTO schemes. Weather codes describe cloud cover, rain, wind, and visibility.

The majority of forms are returned to BTO HQ through our network of organisers. Organisers are therefore in a position to chase up outstanding forms, answer queries and note interesting observations. On receipt at BTO HQ, all forms are double-checked by staff for clarity and obvious errors, before being sent to be input by an outside agency. Field forms are kept for reference. Further detailed checking is carried out on the computerised data set.

Organisation

The survey is organised locally through a network of Regional Organisers (ROs), who are mostly BTO Regional Representatives. The main task of the RO is to find volunteers for each of their survey squares and to coordinate the distribution and return of survey forms. 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 list comes complete with the names of the volunteers who carried out fieldwork in the previous year(s). The same squares are surveyed year after year and new volunteers are found if the original one drops out. The highest priority is to resurvey squares covered in the previous year and then to find volunteers for any gaps in the list.

It is important that organisers deviate as little as possible from the priority order of coverage, so that the random design of the survey is maintained. Obviously, geography comes into play when finding squares near to observers, but it is important that the most promising squares are not picked in preference to squares containing less appealing habitats. Ideally, there should be no gaps in a list but we recognise that it is not always possible to find volunteers for every square, especially in the more remote areas. We do need to ensure that particular habitats are not excluded through observer choice - all habitats are of importance to certain birds.

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 newsletter.

Professional coverage

While the greater part of BBS fieldwork is carried out by skilled amateurs across the country, we recognise that there are few volunteers in the more remote north and west. In order to maintain proper coverage the RSPB has funded professional fieldworkers to cover remote squares in Caithness, Sutherland, Argyll, Ross-shire, and Inverness-shire. A total of 68 squares were covered in 1994 and 1995. This forms a significant proportion of Scottish squares (see Table 1) and covers habitat types that are scarce in the BBS sample as a whole. This input has been invaluable to the survey but the RSPB cannot guarantee this level of support indefinitely. Accordingly, the promotion of the survey to potential volunteers in these areas continues to be a high priority.

Mammal recording

Mammal recording was introduced to the BBS on a trial basis in 1995, with a view to help improve our knowledge of the distribution and population trends of some of our commoner mammals. Of course, 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. Compared with birds, population trends of mammals are quite poorly known. Historically, there has been just one national atlas of mammals but three different atlases of birds. Volunteers have been encouraged to record mammals again in 1996 and we will continue to review the popularity and effectiveness of the trial.

Analysis

The BBS aims to measure between-year changes in population sizes of birds. Briefly, this involves comparing species counts from one year to the next for those squares that have been counted in both years. Counts from the early and late visits can be summarised for this purpose in a number of ways: e.g. as the average bird count from the two visits, as the highest count from the two visits, or as the sum of the counts from both visits. We also have to decide how to treat data when only one visit was made. Further work is necessary to decide which of these options provides the most precise population monitoring. Complications also arise when a new volunteer takes over a square. In this case, we might down weight the change measures for that pair of years, compared with sites where the observer has not changed, although this is not implemented at present. Again more work is required in developing the analysis of BBS data and this we plan to do on a species-by-species basis over the next few years.

SURVEY NEWS

The 1994 season

The introduction of BBS was reported in a variety of magazines and journals, and we achieved far more than we could have hoped in the first year. Our target number of squares was easily reached, and then surpassed, thanks to the tremendous efforts of observers and organisers across the UK. Our hopes of being able to achieve a good geographical spread were also realised with promising numbers of returns from the north and west. We realised that it was important to build on this early success and the scheme was widely publicised through articles and talks.

The 1995 season

Publicity in several magazines in the early spring resulted in over two hundred new enquiries from volunteers wanting to take part in the survey. The majority of the existing volunteers are made up from BTO members. Most subsequent enquiries have come from people who hadn't yet joined. This has given many people their first contact with the BTO and has resulted in many new members. Each volunteer was sent information on the BBS and BTO, and the name and address of their RO. The regional network is without doubt the key to the success of the scheme and promotion at a local level is essential.

The BBS was promoted at the major bird fairs in the summer and a tour of Scottish Ornithologists' Club Branches was undertaken in the autumn. In addition, several talks were given about the work of the Census Unit, including a workshop at the BTO Annual Membership Conference at Swanwick in Derbyshire. Promotion was also directed to regions with no current RO, by circulating calls for help to BTO members. This resulted in improved coverage in a number of regions - but it is no substitute for an effective RO.

Tips to volunteers

With growing experience of the BBS we can now provide a number of tips and reminders to volunteers. The first point is that it is very important to maintain consistency from one year to the next. Try to repeat your survey along the original transect routes and close to the dates and times of the previous year. You can shift your visits a little earlier or later if the spring is particularly early or late.

We would strongly encourage volunteers to carry out a habitat survey each year, so that even minor land use changes are recorded. Collection of habitat data is essential if we are to understand population declines. Time might be saved if you are able to take a photocopy of the habitat form each year. Note that it isn't necessary to draw a detailed sketch map each year if you have previously completed one, but please draw and number your transect route in the box provided.

We would also ask all observers to write the bird names in full beside the two-letter codes on the summary sheets. It is surprising how often we need to check these codes, since it is so easy to write down the wrong code and, even when it is correct, it can be wrongly input. There are also a few problem species. Mistle Thrush (M.) often gets reported as MT (Marsh Tit), Greenfinch (GR) as GF (Golden Pheasant), and Swallows (SL) as SW (Sedge Warbler). Please make sure that single-letter species codes are followed by a full stop - this solves any confusion when the data are computerised (e.g. R. Robin). Another problem species is the Skylark because most records are bird singing in flight. A singing Skylark should be recorded in the most appropriate distance category, rather than as in flight.

Species Summaries

Once the BBS data are checked and computerised it is easy for us to produce county-based species summaries. We have been actively encouraging ROs and the editors of local bird reports to use these summaries, since this provides feedback to volunteers, provides data on the commoner birds that tend to be under-recorded, and promotes the survey among birdwatchers. Obviously, the more squares surveyed in a county or region, the more accurate and meaningful the information collected. Several 1994 bird reports have already included summary information from the BBS.

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 BTO HQ 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 5,000-10,000 separate forms this is a considerable task. Forms are then sent out 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. This process is slowed by the receipt of late forms - so the earlier we receive data, the quicker we are able to report the results back to participants.

RESULTS

Survey coverage

Our target in 1994 had been to cover 1000 BBS squares, and with the help of our volunteers and organisers, we actually covered 1565 squares across the UK (Table 1). Our aim in 1995 was to consolidate this success and expand coverage where possible. This our volunteers were able to do, pushing the total number of squares to at least 1725.

The table shows the numbers of squares issued to Regional Organisers and the proportions actually surveyed by country and year. The numbers of squares in England increased from 1994 to 1995, with the proportion of squares surveyed constant at 70%. Similarly, the numbers of squares covered in Scotland also increased, as did the proportion of squares issued, from 49% to 52%. The number of squares covered in Wales was fairly constant, although the proportion of squares covered was down slightly in 1995, from 64% to 58%. Coverage in Northern Ireland fell between 1994 and 1995 from 34% to 27% of squares issued, but we hope for much better success in the 1996 breeding season. At a UK level, we were able to increase the number of squares surveyed between 1994 and 1995, and maintain the proportion of squares covered at 64% (Table 1). We would obviously like to see coverage increase in all countries, with Northern Ireland, Wales and Scotland being priority areas.

Table 1 also shows the numbers of squares reported as uncoverable by volunteers or regional organisers, mostly because landowners have refused permission to carry out fieldwork. The proportion of uncoverable squares is relatively low at 12% in Scotland, 7% in Wales, 5% in England and 3% in Northern Ireland in 1995. The proportion of these squares were similar in 1994 and 1995.

The distribution maps show the breadth of BBS coverage in the UK (Figure 1). There are obvious clusters, e.g. around London, Bristol and Manchester, but tremendous spread to all points of the compass. The losses and gains between 1994 and 1995 shows us how we are faring regionally and there has been an encouraging increase in coverage in many regions. It is particularly heartening to see improved coverage in many parts of Scotland, south Wales, the south-west of England, East Anglia and many other English counties. There are also many regions where we would like to do a little better.

Table 1. A breakdown of the 1994 and 1995 coverage of BBS squares by country.

	England	*Scotland*	*Wales*	*Northern Ireland*	*Total*
1994					
Issued	1669	506	189	74	2438
Surveyed	**1172 (70%)**	**247 (49%)**	**121 (64%)**	**25 (34%)**	**1565 (64%)**
Uncoverable	87 (5%)	53 (11%)	15 (8%)	0	154 (6%)
1995					
Issued	1861	540	206	76	2683
Surveyed	**1309 (70%)**	**281 (52%)**	**119 (58%)**	**16 (21%)**	**1725 (64%)**
Uncoverable	90 (5%)	64 (12%)	14 (7%)	2 (3%)	170 (6%)

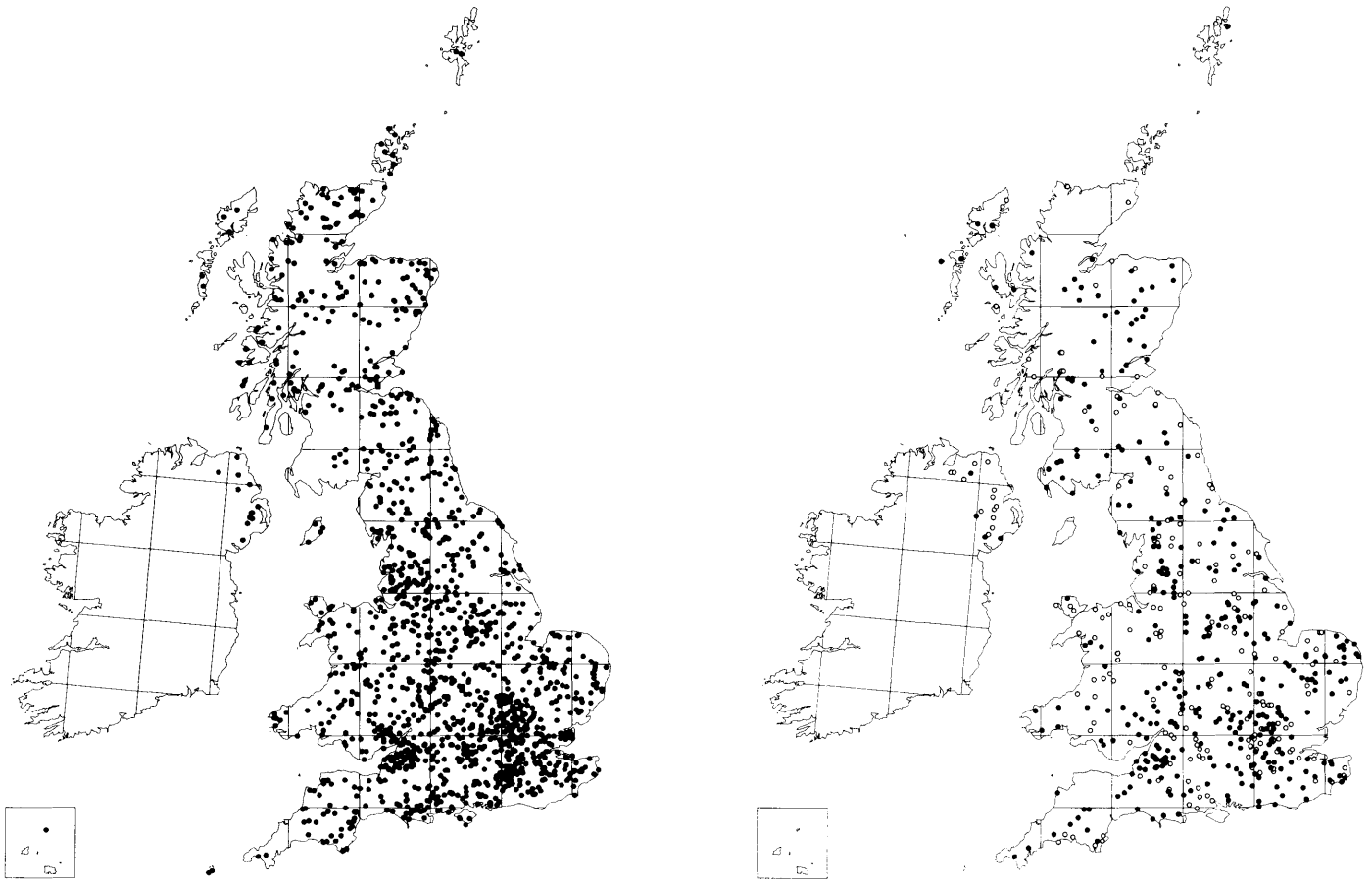


Figure 1. The distribution of BBS squares in 1994 and 1995. The left-hand map shows those 1x1 km squares covered in both 1994 and 1995. The right-hand map shows 1x1 km squares surveyed for the first time in 1995 (closed symbols) and those surveyed in 1994 but not in 1995 (open symbols). Note that the Republic of Ireland is not covered by the BBS at present.

Species coverage

The focus of the BBS is on widespread species and Tables 2-4 show species coverage on the basis of the number of squares found to be occupied.

The range of species recorded in the two years is most impressive, with 192 and 199 species seen in 1994 and 1995 respectively (Tables 2-5). These totals include introduced birds such as Bar-headed Goose and Peacock (since we need to keep an eye on exotic birds in the UK), but not races or forms such as Hooded Crow, Rock Dove and Yellow-legged Gull. Seven species were recorded in 1994 but not in 1995: Great Northern Diver, Snow Goose, Dotterel, Crested Tit, Golden Oriole, Red-backed Shrike and Serin. Fifteen were recorded for the first time in 1995: Whooper Swan, Pintail, Red-crested Pochard, Honey Buzzard, Crane, Grey Plover, Sanderling, Ruff, Jack Snipe, Spotted Redshank, Black Tern, Marsh Warbler, Great Grey Shrike, Scottish Crossbill and Snow Bunting. Of course, these birds are too rare to be monitored annually by BBS and those that stay to breed are mostly covered by the Rare Breeding Birds Panel, but we can still collect valuable information on their occurrence and they would brighten up anyone's BBS visit.

Encouragingly, a total of 76 species were recorded from over 100 squares in both survey years, indicating that these birds would be covered accurately by the BBS (Table 2). This list includes Buzzard, Meadow Pipit and Wheatear, which will all be monitored accurately for the first time in the UK. Four waders will also be monitored, including Oystercatcher, Curlew, Lapwing and Snipe, the latter two have been poorly covered by the CBC and WBS in recent years because of population declines. The table also suggests that monitoring of urban birds such as House Sparrow, Starling and Feral Pigeon will be greatly improved over the present situation. There have been worries over population declines of House Sparrow and Starling, and the BBS should allow us to track their fortunes more accurately from now on.

A further 23 species were recorded from 51-100 squares (Table 3), indicating that while we will be able to measure population changes, this will be with less certainty than those species in Table 2. Ideally, we need to increase the sample sizes for these species over the next few years: Cormorant, Tufted Duck, Redstart, Marsh Tit and Siskin are all close to the threshold of around 100 squares occupied each year.

Species recorded from 1-50 squares tend to be rarer birds that are confined to specific habitats or regions (Table 4). Waterbirds, birds of prey, waders, terns and a varied group of passerines appear on this list. They include a number of upland birds and those with ranges restricted to northern areas including Red-throated Diver, Hen Harrier, Merlin, Peregrine, Whimbrel, Greenshank, Ring Ousel, Twite, Fieldfare, Pied Flycatcher and Crossbill. With increased coverage in the west and north we hope to be able to monitor species such as Grasshopper Warbler, Pied Flycatcher and Crossbill. Overall, it is unlikely that we would be able to provide accurate coverage of most of these birds because of their relative rarity. The scheme is not designed to cover colonial seabirds, though a small number are recorded from coastal survey squares.

Note that colonial landbirds such as Rook, Sand Martin and some gulls can be recorded within BBS as nest counts, although results from these are not presented here.

Table 2. Species recorded by the BBS in 1994-95 in more than 100 squares in each year. For each year, figures on the left are the number of squares the species was recorded from (n) and the figures on the right represent the percentage of squares with that species (%). Species in parenthesis are usually recognised as races or forms of species already represented.

Species	1994		1995		Species	1994		1995	
	n	%	n	%		n	%	n	%
Grey Heron	337	22	394	23	Dunnock	1087	69	1227	71
Mute Swan	114	7	125	7	Robin	1273	81	1427	83
Canada Goose	184	12	226	13	Wheatear	190	12	222	13
Mallard	661	42	742	43	Blackbird	1351	86	1489	86
Sparrowhawk	221	14	210	12	Song Thrush	1030	66	1151	67
Buzzard	286	18	323	19	Mistle Thrush	710	45	774	45
Kestrel	458	29	452	26	Sedge Warbler	163	10	191	11
Red-legged Partridge	262	17	300	17	Lesser Whitethroat	203	13	184	11
Grey Partridge	183	12	191	11	Whitethroat	674	43	772	45
Pheasant	900	58	999	58	Garden Warbler	267	17	306	18
Moorhen	375	24	447	26	Blackcap	713	46	787	46
Coot	128	8	152	9	Chiffchaff	644	41	729	42
Oystercatcher	176	11	196	11	Willow Warbler	972	62	1071	62
Lapwing	492	31	496	29	Goldcrest	347	22	438	25
Snipe	104	7	117	7	Spotted Flycatcher	173	11	160	9
Curlew	352	22	368	21	Long-tailed Tit	472	30	535	31
Black-headed Gull	372	24	415	24	Coal Tit	413	26	421	24
Common Gull	109	7	117	7	Blue Tit	1230	79	1367	79
Lr Black-backed Gull	294	19	323	19	Great Tit	1113	71	1248	72
Herring Gull	320	20	328	19	Nuthatch	205	13	213	12
Feral Pigeon	364	23	449	26	Treecreeper	214	14	213	12
Stock Dove	457	29	526	30	Jay	421	27	392	23
Woodpigeon	1353	86	1521	88	Magpie	1022	65	1131	66
Collared Dove	723	46	807	47	Jackdaw	844	54	942	55
Turtle Dove	141	9	158	9	Rook	775	50	845	49
Cuckoo	658	42	704	41	Carrion Crow	1302	83	1438	83
Swift	716	46	754	44	Raven	120	8	122	7
Green Woodpecker	358	23	406	24	Starling	1136	73	1273	74
Gt Spotted Woodpecker	362	23	458	27	House Sparrow	934	60	1041	60
Skylark	1123	72	1220	71	Tree Sparrow	113	7	121	7
Swallow	1057	68	1099	64	Chaffinch	1359	87	1502	87
House Martin	527	34	609	35	Greenfinch	917	59	1050	61
Tree Pipit	108	7	110	6	Goldfinch	776	50	826	48
Meadow Pipit	521	33	550	32	Linnet	794	51	879	51
Yellow Wagtail	128	8	166	10	Bullfinch	371	24	349	20
Grey Wagtail	113	7	144	8	Yellowhammer	814	52	891	52
Pied Wagtail	668	43	804	47	Reed Bunting	272	17	300	17
Wren	1346	86	1520	88	Corn Bunting	152	10	140	8

Table 3. Species recorded by the BBS in 1994-95 in 51-100 squares in at least one of the years. See Table 2 for details.

Species	1994		1995		Species	1994		1995	
	n	%	n	%		n	%	n	%
Great Crested Grebe	43	3	53	3	Sand Martin	54	3	81	5
Cormorant	81	5	111	6	Redstart	95	6	112	6
Greylag Goose	50	3	63	4	Whinchat	66	4	78	5
Shelduck	85	5	91	5	Stonechat	52	3	62	4
Tufted Duck	97	6	94	5	Reed Warbler	57	4	70	4
Red Grouse	83	5	90	5	Wood Warbler	63	4	50	3
Golden Plover	81	5	76	4	Marsh Tit	88	6	113	7
Redshank	59	4	66	4	Willow Tit	63	4	55	3
Common Sandpiper	55	4	46	3	(Hooded Crow)	73	5	70	4
Gt Black-backed Gull	64	4	67	4	Siskin	96	6	91	5
Little Owl	66	4	68	4	Redpoll	90	6	89	5
Tawny Owl	56	4	60	3					

Table 4. Species recorded by the BBS in 1994-95 in 1-50 squares in at least one of the years. The table shows the number of squares occupied in each year. In all cases, these birds occur on fewer than 3% of survey squares.

Species	*1994*	*1995*	*Species*	*1994*	*1995*	*Species*	*1994*	*1995*
Red-throated Diver	13	11	Hobby	22	22	Black Tern	-	1
Black-throated Diver	1	1	Peregrine	26	22	Black Guillemot	1	2
Great Northern Diver	1	-	Ptarmigan	2	1	(Rock Dove)	7	6
Little Grebe	28	37	Black Grouse	5	13	Ring-necked Parakeet	4	6
Fulmar	18	18	Quail	11	17	Barn Owl	11	13
Gannet	4	8	Golden Pheasant	1	4	Long-eared Owl	2	3
Shag	6	6	Peacock - feral	2	1	Short-eared Owl	9	12
Little Egret	1	1	Water Rail	3	3	Nightjar	1	2
Whooper Swan	-	3	Corncrake	1	2	Kingfisher	24	40
Pink-footed Goose	3	1	Crane	-	1	Lr Spotted Woodpecker	28	7
Bar-headed Goose - feral	-	1	Avocet	1	2	Woodlark	8	8
Barnacle Goose	2	4	Stone Curlew	3	2	Rock Pipit	10	11
Snow Goose	1	-	Little Ringed Plover	8	4	Dipper	33	37
Brent Goose	1	1	Ringed Plover	25	19	Nightingale	26	25
Egyptian Goose	2	2	Dotterel	2	-	Black Redstart	2	1
Mandarin Duck	5	8	Grey Plover	-	3	Ring Ouzel	21	20
Wigeon	5	6	Sanderling	-	1	Fieldfare	10	40
Gadwall	17	15	Dunlin	23	28	Redwing	2	6
Teal	13	25	Ruff	-	1	Cetti's Warbler	2	4
Pintail	-	1	Jack Snipe	-	1	Grasshopper Warbler	40	46
Shoveler	9	11	Woodcock	6	9	Marsh Warbler	-	1
Red Crested Pochard	-	1	Black-tailed Godwit	1	3	Dartford Warbler	4	3
Pochard	11	10	Bar-tailed Godwit	1	2	Firecrest	2	1
Eider	7	9	Whimbrel	20	21	Pied Flycatcher	36	37
Goldeneye	5	6	Spotted Redshank	-	1	Crested Tit	1	-
Common Scoter	1	2	Greenshank	11	13	Golden Oriole	1	-
Red-breasted Merganser	7	7	Green Sandpiper	2	4	Red-backed Shrike	1	-
Goosander	20	31	Turnstone	4	3	Great Grey Shrike	-	1
Ruddy Duck	5	4	Arctic Skua	9	6	Chough	3	5
Honey Buzzard	-	1	Great Skua	6	5	Brambling	3	3
Red Kite	9	10	Little Gull	1	1	Serin	1	-
Marsh Harrier	5	9	(Yellow-legged Gull)	1	-	Twite	24	24
Hen Harrier	5	9	Kittiwake	3	1	Crossbill	37	19
Goshawk	7	5	Sandwich Tern	5	4	Scottish Crossbill	-	2
Golden Eagle	6	7	Common Tern	29	35	Hawfinch	1	1
Osprey	3	5	Arctic Tern	7	10	Snow Bunting	-	1
Merlin	10	11	Little Tern	1	1	Cirl Bunting	3	1

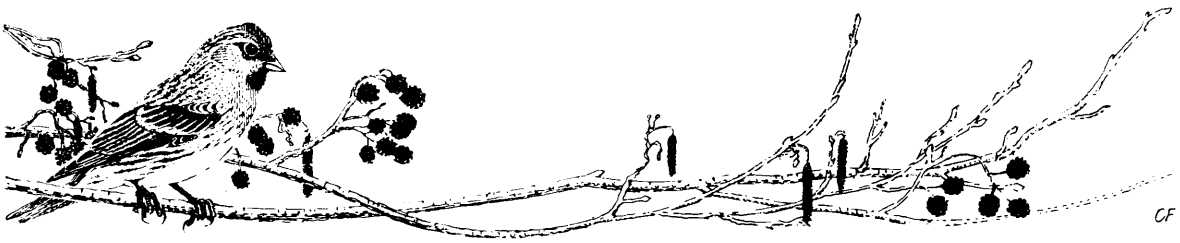
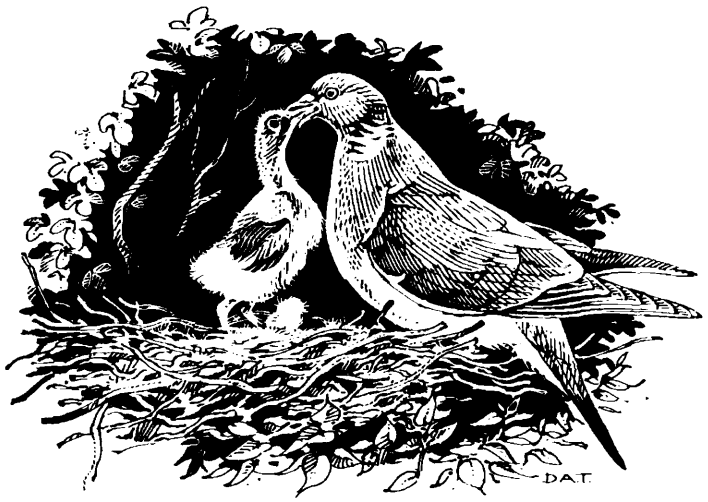


Table 5 shows the top twenty most widespread and abundant birds counted by volunteers. The Woodpigeon occurs on the highest number of squares across the UK followed by Wren, Chaffinch, Blackbird, Carrion Crow and Robin. The average BBS square held 15 Woodpigeon, 8 Wren, 8 Chaffinch, 9 Blackbird, 7 Carrion Crow and 6 Robin. In contrast the most abundant bird was the Starling followed by Woodpigeon, House Sparrow, Blackbird, Chaffinch and Wren. The average counter records 15 Starling, 15 Woodpigeon, 15 House Sparrow, 9 Blackbird, 8 Chaffinch and 8 Wren. It comes as no surprise that the most widespread birds are also the most abundant ones - nineteen birds occur on both lists. Crows are well represented with Carrion Crow, Magpie and Jackdaw all among the top twenty commonest species. Skylark, Song Thrush, and Linnet are also among the most abundant birds yet we know from the CBC that their populations have been in serious decline over the last 25 years. A further group of common birds, including Swallow, Starling and Blackbird give cause for conservation concern because their populations have shown signs of long-term decline, though at a lesser rate than those species above. This illustrates the point that the monitoring of apparently common birds is as every bit as valuable as monitoring the rare ones. The last 25 years have shown us how the commonest birds may be susceptible to dramatic declines - underlining the importance of the BBS.

Table 5. Top twenty species from the BBS in 1995 showing the average bird counts on survey squares. Distribution is measured as the number of squares occupied. Abundance is measured as the total number of birds counted. The numbers in brackets are the average counts across occupied squares.

	Most widespread			*Most abundant*	
Rank	***Species***	***Average count***	***Rank***	***Species***	***Average count***
1	Woodpigeon	(15)	1	Starling	(22)
2	Wren	(8)	2	Woodpigeon	(15)
3	Chaffinch	(8)	3	House Sparrow	(15)
4	Blackbird	(9)	4	Blackbird	(9)
5	Carrion Crow	(7)	5	Chaffinch	(8)
6	Robin	(6)	6	Wren	(8)
7	Blue Tit	(7)	7	Carrion Crow	(7)
8	Starling	(22)	8	Blue Tit	(7)
9	Great Tit	(4)	9	Jackdaw	(9)
10	Dunnock	(3)	10	Robin	(6)
11	Skylark	(6)	11	Skylark	(6)
12	Song Thrush	(3)	12	Swallow	(5)
13	Magpie	(4)	13	Greenfinch	(5)
14	Swallow	(5)	14	Linnet	(5)
15	Willow Warbler	(4)	15	Magpie	(4)
16	Greenfinch	(5)	16	Great Tit	(4)
17	House Sparrow	(15)	17	Willow Warbler	(4)
18	Pheasant	(4)	18	Dunnock	(3)
19	Jackdaw	(9)	19	Pheasant	(4)
20	Yellowhammer	(3)	20	Song Thrush	(3)



Between-year changes

The tracking of bird populations from year to year is the main purpose of the BBS and with two years of data computerised we can now show the first between-year changes from 1994 to 1995 (Table 6). The table shows the percentage changes in population sizes of the commoner species (i.e. those listed in Tables 2 and 3), a positive change indicates an increase, a negative one a decrease. Our aim in the medium- to long-term is to examine population trends over longer time periods, because these are most meaningful, even so, if we limit ourselves to the one between-year change we find interesting and sometimes unexpected results.

The upper and lower confidence limits (UCL and LCL) on the changes indicate the certainty that can be attached to each change measure. The closer the limits are to the change, the more precise that change measure. When the limits are both positive or both negative, we can be 95% confident that a real change, i.e. a statistically significant change has taken place. If the confidence limits overlap zero there is no statistical evidence that the population has changed either way.

The table illustrates, first, the wide range of birds covered by the BBS, a total of nearly 100 species. With increasing BBS coverage across the UK in the next few years, this figure can only rise. A variety of birds show significant changes between 1994 and 1995, and on balance,

Table 6. Population changes of abundant species 1994-1995. Change measures were assessed using a Loglinear model with Poisson error terms. We used the mean species count from early and late counts for each square (or the highest count if a square was only visited once in the breeding season). Counts were modelled as a function of square and year effects. Each observation was weighted to correct for the under- or over-sampling of BBS regions within the UK. Change is the percentage change between years with its lower and upper 95% confidence limits LCL and UCL respectively. Only squares surveyed in both years are included in the analysis. Population changes are statistically significant for those species in bold type. The sample sizes are the number of squares occupied in at least one of the years. See text for details.

Species	*Sample*	*Change*	*LCL*	*UCL*	*Species*	*Sample*	*Change*	*LCL*	*UCL*
Great Crested Grebe	55	18	-7	44	**Pied Wagtail**	**814**	**21**	**13**	**29**
Cormorant	124	15	-14	44	**Wren**	**1250**	**14**	**12**	**17**
Grey Heron	**461**	**21**	**8**	**33**	Dunnock	1079	4	0	9
Mute Swan	**140**	**-22**	**-43**	**-1**	**Robin**	**1193**	**11**	**8**	**14**
Greylag Goose	**75**	**169**	**116**	**222**	**Redstart**	**116**	**31**	**11**	**51**
Canada Goose	**265**	**24**	**7**	**41**	Whinchat	89	16	-10	42
Shelduck	93	8	-13	30	**Stonechat**	**69**	**57**	**26**	**89**
Mallard	757	6	-1	14	**Wheatear**	**249**	**32**	**18**	**45**
Tufted Duck	117	9	-15	34	Blackbird	1226	-1	-4	1
Sparrowhawk	305	-10	-29	9	Song Thrush	1061	-1	-6	4
Buzzard	**337**	**11**	**0**	**22**	Mistle Thrush	834	-6	-15	2
Kestrel	**586**	**-16**	**-28**	**-4**	Sedge Warbler	210	14	0	29
Red Grouse	89	13	-7	32	Reed Warbler	72	0	-23	23
Red-legged Partridge	305	12	0	24	Lesser Whitethroat	262	-12	-31	7
Grey Partridge	237	-13	-33	7	**Whitethroat**	**758**	**13**	**7**	**20**
Pheasant	917	0	-4	5	Garden Warbler	346	7	-7	21
Moorhen	454	11	1	21	Blackcap	755	6	-1	12
Coot	**155**	**21**	**5**	**38**	Wood Warbler	70	-19	-53	15
Oystercatcher	**202**	**-26**	**-37**	**-15**	**Chiffchaff**	**691**	**7**	**1**	**14**
Golden Plover	**89**	**-63**	**-95**	**-31**	**Willow Warbler**	**990**	**16**	**12**	**20**
Lapwing	**543**	**21**	**12**	**31**	**Goldcrest**	**420**	**30**	**21**	**39**
Snipe	129	3	-21	27	Spotted Flycatcher	229	-17	-37	3
Curlew	372	4	-4	13	Long-tailed Tit	593	11	-1	23
Redshank	71	4	-24	31	**Marsh Tit**	**136**	**36**	**11**	**61**
Common Sandpiper	65	-27	-60	5	Willow tit	76	-24	-60	12
Black-headed Gull	444	11	-1	23	Coal Tit	465	4	-5	13
Common Gull	140	7	-15	28	**Blue Tit**	**1147**	**8**	**5**	**12**
Lr Black-backed Gull	361	3	-10	15	**Great Tit**	**1112**	**5**	**0**	**10**
Herring Gull	376	-2	-14	10	Nuthatch	248	6	-10	21
Gt Black-backed Gull	84	-16	-46	14	Treecreeper	284	17	-1	35
Feral Pigeon	468	-6	-17	5	**Jay**	**493**	**-26**	**-39**	**-14**
Stock Dove	573	9	-1	20	**Magpie**	**1008**	**-5**	**-9**	**0**
Woodpigeon	**1237**	**-11**	**-14**	**-7**	Jackdaw	879	5	-1	11
Collared Dove	778	2	-4	8	Rook	827	2	-6	9
Turtle Dove	182	5	-14	24	Carrion Crow	1285	0	-5	4
Cuckoo	778	2	-7	10	**Raven**	**148**	**35**	**12**	**58**
Little Owl	102	-17	-51	17	**Starling**	**1098**	**8**	**2**	**13**
Tawny Owl	89	-16	-55	24	House Sparrow	910	3	-2	7
Swift	**827**	**-9**	**-18**	**0**	Tree Sparrow	137	-3	-25	19
Green Woodpecker	**457**	**-13**	**-25**	**-1**	Chaffinch	1236	-1	-3	2
Gt Spotted Woodpecker	483	11	0	23	**Greenfinch**	**952**	**6**	**1**	**12**
Skylark	1068	1	-3	4	Goldfinch	856	-4	-12	4
Sand Martin	**88**	**52**	**24**	**81**	Siskin	115	-25	-50	0
Swallow	**1043**	**-17**	**-23**	**-11**	**Linnet**	**859**	**15**	**9**	**22**
House Martin	**627**	**12**	**4**	**21**	Redpoll	118	0	-24	24
Tree Pipit	129	-17	-39	5	**Bullfinch**	**459**	**-17**	**-30**	**-3**
Meadow Pipit	**519**	**7**	**2**	**12**	**Yellowhammer**	**809**	**-8**	**-13**	**-3**
Yellow Wagtail	**166**	**24**	**6**	**42**	Reed Bunting	329	5	-7	18
Grey Wagtail	162	23	-1	46	Corn Bunting	170	-5	-21	10

most are population gains. In fact, many BBS results are very similar to those from the CBC, with both schemes indicating significant increases in Wren, Robin, Whitethroat, Chiffchaff, Willow Warbler, and Goldcrest, but a decline in the Yellowhammer. Some of these birds appear to be bouncing back from cold winter weather in previous years, but the increases among the warblers might reflect better conditions on their migration routes or wintering grounds. Some of the farmland birds also fared relatively well with significant, and encouraging, increases in Lapwing, Stock Dove, Yellow Wagtail and Linnet, but continued declines for Kestrel, Swallow, Bullfinch, and Yellowhammer. The long-term declines of farmland birds over the last twenty years places them in a perilous position and they remain a high priority for monitoring and conservation action.

Of course, the BBS covers many more habitats and birds than previous schemes. Many birds with western and northern distributions in the UK are well covered by the BBS and this allows us to see how their populations fluctuate for the very first time.

Grebes to Gulls

Numbers of Grey Heron, Greylag Goose, Canada Goose, Buzzard, Moorhen, Coot and Lapwing increased significantly from 1994 to 1995, the population change for Greylag Goose being particularly marked (Table 6). Populations of Mute Swan, Kestrel, Oystercatcher and Golden Plover all declined. The falling numbers of Kestrel is of particular concern as the CBC has shown their populations to have declined steadily over the last 25 years. The dramatic decline in the number of Golden Plover is of equal concern. For Golden Plover, and other waterbirds, changes may be complicated by the presence of migrants or large flocks close to the breeding grounds. It is probably too early to say whether the trends are of great consequence but we must remain vigilant and watch these birds in future seasons.

Pigeons to Woodpeckers

Woodpigeon numbers declined significantly between 1994 and 1995 (Table 6), although they remain the most widespread species and one of the most abundant (Table 5). Numbers of Swift and Green Woodpecker also declined and the reason for these changes are unclear.

Larks to Thrushes

There were significant and relatively large increases for Sand Martin, House Martin, Meadow Pipit, Yellow Wagtail, Pied Wagtail, Wren, Robin, Redstart, Stonechat and Wheatear. It is certainly encouraging to see that the latter three species are monitored by the BBS and a bonus that they appear to be increasing. Increases in the numbers of martins is also welcome given concerns for the health of their populations. In contrast, the number of Swallows fell significantly, and again, this is a species in long-term decline. Future seasons will tell us whether these changes are maintained.

Warblers to Flycatchers

Warbler numbers were generally up in 1995 with significant increases for Whitethroat, Chiffchaff, Willow Warbler and Goldcrest. These trends mirror those found by CBC as mentioned above.

Tits to Starling

Curiously, numbers of Marsh, Blue and Great Tit, Raven and Starling all increased significantly, while populations of Jay and Magpie fell. The upturn in Starling numbers is welcome given long-term declines detected by the CBC. It might be that the BBS is monitoring mostly urban Starling populations never previously surveyed and that they are faring better than their rural counterparts. The small decline in Magpie numbers may come as a surprise to many readers, but recent BTO research shows their populations to have levelled off from the late 1970s.

Sparrows to Buntings

Greenfinch and Linnet numbers were both up significantly in 1995, but those of Bullfinches and Yellowhammer were down. The upward trend for the Linnet is most welcome as this is a farmland bird that has been in decline and is of high conservation concern. The Bullfinch has been identified as a species of high conservation concern on account of severe population declines over the last 25 years. The continued downward trend is therefore of great concern. The decline of the Yellowhammer appears to be a more recent trend, first appearing in the CBC indices in the 1990s. Of all the farmland seedeaters, the Yellowhammer has held its own in the face of changing farming practices but may now be in decline. Future BBS data will tell us to what extent this decline is continued and over which areas.

Country-based trends

One of the great strengths of the BBS is its ability to provide regional information for a range of widespread species. Repeating the above analysis on a country basis demonstrates that many population trends are common across the UK, but there are a number of interesting regional differences. The results are preliminary, and further work is required to test whether trends differ significantly between countries. One should also remember that samples sizes may be very small in some countries and so these trends may be less reliable than those at a UK level.

To a large degree, population changes in England merely reflect those for the UK, which is to be expected as most data come from England. The only differences are that English populations of Dunnock, Blackcap, Jackdaw and House Sparrow show increases, while those of Grey Partridge, Lesser Black-backed Gull, Greater Black-backed Gull, Mistle Thrush, Wood Warbler, Spotted Flycatcher and Rook show declines. The decline of Grey Partridge and Spotted Flycatcher is worrying as these species are of high conservation concern and have been in steady decline. There are also a number of birds where there is a UK trend but none in England. These include Buzzard, Kestrel, Oystercatcher, Sand Martin, House Martin, Meadow Pipit, Stonechat, Chiffchaff, Marsh Tit, Great Tit and Magpie. While these trends are now non-significant, they are mostly in the same direction as those at UK level.

For Scotland and Wales it is easier to list those species where the population trends mirror those at a UK level and then describe any anomalies. Scottish populations of Meadow Pipit, Pied Wagtail, Wren, Robin, Stonechat, Wheatear, Willow Warbler, Goldcrest, Blue Tit, Raven, Starling and Linnet all increased significantly, while those of Kestrel, Oystercatcher, Golden Plover and Swallow declined. These trends are identical to those in the UK as a whole. In addition, Scottish populations of Lesser Black-backed Gull, Sedge Warbler, Treecreeper, Rook, House Sparrow and Reed Bunting all increased significantly between 1994 and 1995.

Welsh birds also appear to be fluctuating in synchrony with those in the UK. Welsh populations of Green Woodpecker, House Martin, Meadow Pipit, Wren, Robin, Chiffchaff, Willow Warbler and Linnet were all up, while those of Woodpigeon and Jay were significantly down. Again these trends are apparent at a UK level. In addition, Herring Gull, Great Spotted Woodpecker, Wood Warbler and Treecreeper increased in Wales, but Collared Dove, Cuckoo and Starling declined. Note that the latter trend is actually in the opposite direction to that shown at a UK level.

In the future, our aim is to produce a regional analysis for Northern Ireland as well. With such a small sample size this is not possible at present but as the number of squares increases across the UK, we shall be able to produce accurate regional analyses for each country.

Habitat coverage

An admirable, and most encouraging, 99% of volunteers completed habitat forms in 1994 and 97% in 1995. It is most important that every square has a habitat form for each year surveyed so that changes in land use can be followed and their impacts on wildlife understood. Just over half of the BBS sample is from a farmland landscape (Table 7), reflecting the fact that most of the UK is given over to farming. Human sites proved to be the second most common land use, emphasising that suburban and urban habitats are extremely widespread across the UK and presumably of considerable significance to our birds. A range of other habitats were covered by volunteers, including woodland, scrub, heath and grassland - each of these habitats being of value to certain bird populations. One of the principle aims of the BBS is to ensure that all habitats are covered. That this has been achieved emphasises the importance of randomly selecting the survey squares.

Mammals

The response to the trial mammal recording in 1995 was very encouraging with 76% of BBS volunteers taking part. Most fieldworkers were able to find mammals on their squares and only 7% recorded none at all. Please remember to return a nil form if you didn't come across any mammals - this is still valuable information in its own right.

A total of 38 species were recorded, ranging from Orkney Vole in the north to Common Dormouse in the south. Rabbit was by far the most widespread species followed by Brown Hare and Red Fox (Table 8). Some of the more interesting records include four squares with Pine Marten, six with Otter, and fifteen with Red Squirrel. Records of Red Squirrel came from the Isle of Wight, Cumbria, Northumberland and four regions in Scotland.

Table 7. Habitat coverage in the BBS in 1994 and 1995. The table shows the number (n) and percentage (%) of 200 m transect sections falling into the major habitat categories in each year.

Habitat type	*1994*		*1995*	
	n	%	*n*	%
Farmland	8247	54.1	8906	54.0
Human Sites	2400	15.8	2646	16.0
Woodland	1823	12.0	1969	11.9
Heathland & Bogs	1239	8.1	1294	7.8
Grassland	765	5.0	798	4.8
Scrubland	350	2.3	384	2.3
Water Bodies	265	1.7	347	2.1
Inland Rock	83	0.5	65	0.4
Coastal	53	0.3	84	0.5
Miscellaneous	11	0.1	8	0

Table 8. Mammal recording within the BBS 1995. The table shows the number and percentage of squares occupied for the top 15 most widespread species.

Mammal	*Number*	*Percentage*
	n	%
Rabbit	949	73
Brown Hare	487	37
Red Fox	417	32
Grey Squirrel	392	30
Roe Deer	247	19
Mole	89	7
Red Deer	86	7
Badger	80	6
Muntjac Deer	61	5
Fallow Deer	46	4
Mountain Hare	38	3
Stoat	34	3
Common Shrew	26	2
Hedgehog	24	2
Brown Rat	22	2

FOCUS

Bird distributions

Using BBS data from 1995 it is possible to plot distribution maps for each species. Indeed, the extensive nature of BBS fieldwork produces maps that are similar to the national atlas except perhaps, in the far north and west where coverage is not comprehensive. The following four maps illustrate particular distribution patterns and compare extremely favourably with the *The New Atlas of Breeding Birds* confirming the effectiveness of the BBS monitoring sample.

With excellent coverage in the south and east, the map for Turtle Dove shows its population to be concentrated in these areas. Turtle Doves are seldom recorded breeding outside England and this is borne out by their BBS distribution.

With species as widespread as Meadow Pipit, it is perhaps useful to look at areas where it doesn't occur in the UK. These tend to be urban or suburban areas, as well as lowland regions in south and central England with heavier clay soils. The highest densities are found on higher ground to the north and west, it is very encouraging to see how well these areas have been covered by the BBS.

In contrast, the Feral Pigeon is most common in urban areas. Looking at the map closely, it is possible to pick out conurbations like London, Manchester, Birmingham and Bristol. Those dots in the far north and west may well be Rock Doves but the two forms are difficult to separate.

One could probably guess the species from the Buzzard distribution map. Their numbers increase rapidly westwards across England towards the south west and Wales. It is a very scarce breeder in the east except in Scotland, where the species starts spreading further east from its stronghold in the west. In fact, some of the gaps in the west are probably gaps in coverage - we are keen to encourage more volunteers to take part in the west of the UK.

Human sites - undiscovered territory

Walking through a housing estate, or along a main road in the middle of a city, may not seem an ideal way to birdwatch. However, surveyors working in these habitats are providing extremely valuable information that has never been collected before. We have no way of knowing how important these areas are to our bird populations so the BBS is again breaking new ground. There is evidence that Starling and House Sparrow, for example, are declining across much of Northern Europe. This is matched by CBC data but we need much improved coverage of the UK to be sure. Indeed, BBS data show small population gains between 1994 and 1995, the change for Starling being statistically significant (Table 6).

One of our most familiar urban birds, the Feral Pigeon is well represented in the BBS sample, but in general the status of this species is poorly known. Data from two distribution atlases covering 1968-72 and 1988-91 show range expansion in the UK, most notably in built up areas. Friend or foe, the Feral Pigeon needs to be monitored and good coverage of Human Sites will allow us to keep a check on this bird.

Preliminary analysis shows that 33% of all Blackbirds, 40% of Greenfinches and Starlings, and an amazing 65% of all House Sparrows, were recorded from Human Sites in the BBS. Our villages, towns and cities are all acting as valuable habitats for a wide range of species.

Birdwatching in built up areas may not be as scenic as walking through the countryside, but quite often, greater numbers and more species are seen, and results can be quite surprising.

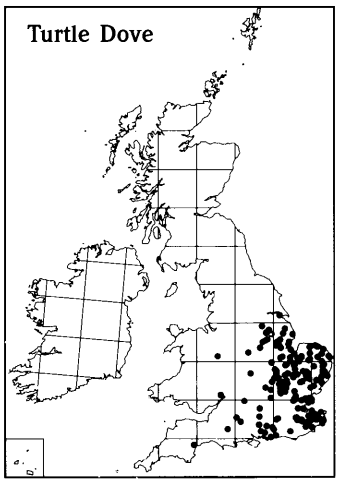
Upland squares - hard work producing valuable data

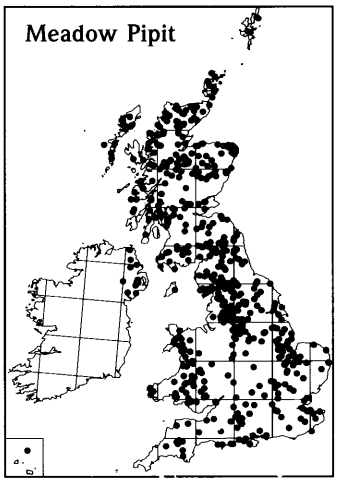
Remote squares often require a considerable journey to reach, sometimes longer than the survey takes to complete, and the diversity of birds found in these areas may be low. However, a square containing a handful of Meadow Pipits is as valuable as any other in the BBS as a whole. Again, this habitat has been under-recorded in the past. Upland birds like Buzzard, Red Grouse, Golden Plover, Meadow Pipit, Skylark and Wheatear are all well represented in the BBS. While Meadow Pipit and Wheatear showed significant gains between 1994 and 1995, the Golden Plover showed a large decline. We look forward to seeing how their numbers are changing in these precious and vulnerable habitats in the future. Rest assured that we very much appreciate the hard work of our volunteers in covering these areas.

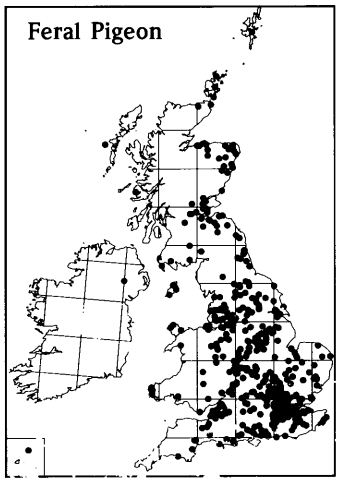
The future

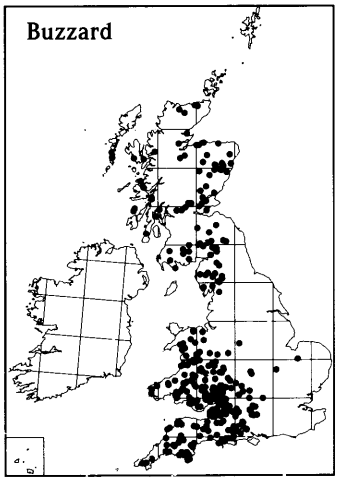
Our plans for the future are to build upon the success we have achieved so far by maintaining and developing BBS coverage across the UK. Our target of 2-3000 survey squares is ambitious but we move a little nearer to it each year. This report demonstrates the breadth of information we are able to gather with the present coverage. Increasing the number of squares surveyed will increase our ability to provide the baseline information for bird conservation.

Producing meaningful results and providing feedback to volunteers will remain high priorities. We will continue to present updates from the BBS and promote the survey around the country when opportunities arise. We believe it is very important to keep our volunteers fully informed of progress. Each square helps us to build a comprehensive picture of our breeding birds. As such, we want to ensure that every volunteer realises the value and importance of their data. Your support for BBS will continue to be highly valued in future years.









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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)* - Roy Leigh; *Cheshire (north & east)* - Clive Richards; *Cheshire (south)* - Colin Lythgoe; *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* - vacant; *Durham* - David Sowerbutts; *Essex (north-east)* - Peter Dwyer; *Essex (north-west)* - Geoff Gibbs; *Essex (south)* - Maurice Adcock; *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)* - John Mighell; *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 Cadwallender; *Nottinghamshire* - Lynda Milner; *Oxfordshire (north)* - Michael Pritchard; *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* - Barrie Watson; *Warwickshire* - Joe Hardman; *Isle of Wight* - James Gloyn; *Wiltshire (north)* - Jean Wilder; *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 Yorkshire)* - Dave Porter; *Yorkshire (north-east)* - Syd Cochrane; *Yorkshire (Bradford)* - Mike Denton; *Yorkshire (York)* - Peter Hutchinson; *Yorkshire (Leeds & Wakefield)* - Terry Dolan; *Yorkshire (south-west)* Geoff Carr; *Yorkshire (south-east)* - Chris Falshaw.

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Scotland: *Aberdeen, Kincardine & Deeside* - Paul Doyle; *Angus* - Ken Slater; *Argyll (north & Mull)* - Mike Madders; *Argyll (south)* - vacant; *Arran* - vacant; *Ayrshire* - vacant; *Islay, Jura & Colonsay* - Malcolm Ogilvie; *Benbecula & The Uists* - Paul Boyer; *Borders* - vacant; *Caithness* - vacant; *Central Scotland* - Neil Bielby; *Dumfries* - Richard Mearns; *Fife & Kinross* - Norman Elkins; *Inverness* - Hugh Insley; *Kirkcudbright* - vacant; *Lanark, Renfrew & Dunbarton* - John Simpson; *Lewis & Harris* - Chris Reynolds & Alistair Pout (jointly); *Lothian* - George Smith; *Moray & Nairn* - Bob Proctor; *Orkney* - Colin Corse; *Perthshire* - Bobby Sommerville; *Small isles (Rum, Eigg, Muck, Canna)* - Bob Swann; *Rossshire* - Andrew Ramsay; *Shetland* - Dave Okill; *Skye* - Roger and Pat Cottis; *Sutherland* - vacant; *Wigtown* - Geoff Sheppard.

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FURTHER READING

Carter, S.P. & Gregory, R.D. (1994). Keeping track of our breeding birds. *BTO News* 190: 12-13.

Gibbons, D.W., Reid, J.B. & Chapman, R.A. (1993). The New Atlas of Breeding Birds in Britain and Ireland: 1988-1991. T. & A.D. Poyser, London.

Greenwood, J.J.D. (1993). Random Sampling: Getting the numbers right. *BTO News* 188: 11-13.

Gregory, R.D. & Baillie, S.R. (1994). Evaluation of sampling strategies for 1km squares for inclusion in the Breeding Bird Survey. *BTO Research Report No. 139.* Thetford (BTO).

Gregory, R.D. & Baillie, S.R. (in press). Survey design and sampling strategies for breeding bird monitoring. Proceedings of the 13th International Conference of the European Bird Census Council, Estonia, 1995.

Gregory, R.D., Baillie, S.R & Bashford, R.I. (in press). Monitoring breeding bird in the United Kingdom. Proceedings of the 13th International Conference of the European Bird Census Council, Estonia, 1995.

Gregory, R.D. & Bashford, R.I. (1995). Results from the 1994 Breeding Bird Survey. *BTO News* 201: 14-15.

Gregory, R.D. & Carter, S.P. (1993). Breeding Bird Survey takes to the air. *BTO News* 189: 1.

Gregory, R.D. & Carter, S.P. (1994). Results from the Pilot Census Project. *BTO News* 194: 12-13.

Gregory, R.D. & Carter, S.P. (1995). Breeding Bird Survey: fourteen hundred squares and still counting. *BTO News* 196: 8-9.

Hume, R. (1995). Ups and Downs in the Bird World. *Birds.* Spring 1995: 20-24.

Marchant, J.H., Hudson, R., Carter, S.P. & Whittington, P.A. (1990). Population trends in British breeding birds. Tring (BTO).

Marchant, J.H. (1994). The new Breeding Bird Survey. *British Birds* 87: 26-28.

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