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Assessment of the Impacts of the Entry Level Scheme on Bird Populations: Results from the Baseline Year, 2005

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Executive Summary

1. A new agri-environment scheme, the Entry Level Scheme, was rolled out across the whole of England in 2005. This is the 'broad and shallow' component of Environmental Stewardship that aims to encourage a large number of farmers to deliver effective environmental management on their farm. A key objective of the scheme is to reverse declines in biodiversity, especially farmland birds, and hence contribute to the delivery of Defra's PSA 3(a) which seeks to reverse the decline in farmland birds by 2020. Progress with the PSA is measured by the Farmland Bird Indicator (FBI), which forms part of the wild birds indicator adopted by Government as one of 20 'headline indicators' of the sustainability of lifestyles in the UK.

2. The BTO/RSPB/JNCC Breeding Bird Survey (BBS), based on data from random 1-km squares across Britain, provides the basis for the FBI. Currently there are c. 1,500 BBS squares surveyed annually in lowland England. A previous analysis of BBS data indicated that 1,000 extra BBS squares should be monitored in order to achieve adequate power to detect population changes in key species (especially Skylark and Yellowhammer) that may arise as a result of the Entry Level Scheme's introduction.

3. In 2005, 1,000 additional 1-km squares, divided equally between arable and pastoral landscapes, were selected for potential survey to supplement the current BBS sample. This provides the opportunity to assess the impact of the Entry Level Scheme on farmland bird populations by monitoring bird abundance coincident with implementation of the Entry Level Scheme (in 2005) and post-implementation (2008 and 2011).

4. A total of 975 additional sample survey squares (referred to as 'ASS squares') and 1,474 standard BBS squares were surveyed in lowland farmland landscapes in 2005. The coverage of extra squares was therefore very close to the target required for adequate power to detect overall population change. ASS square coverage was not random but showed a bias towards more northerly and westerly regions. This provided surveys in regions where BBS coverage was relatively poor.

5. There was no systematic bias in the number of species recorded between ASS and BBS squares. There were some significant differences in abundance and occurrence for individual species: several farmland specialists were more abundant and widespread in ASS squares, but several habitat generalists were less abundant. This may have been due to a higher cover of built land on BBS squares.

6. A previous power analysis suggested that 1,000 squares in each landscape type would provide adequate power to detect population change in Skylark and Yellowhammer and one or more of Lapwing, Starling and Linnet. There was a total of 1,119 arable squares and a total of 816 pastoral squares for the combined BBS and ASS sample.

7. New power analyses based on the combined BBS and ASS samples were performed. In pastoral landscapes, estimated power to detect population change between 2008 and 2011 was 51% for Skylark, 28% for Yellowhammer and 27% for Starling. For other species power was less than 20%. In arable landscapes, estimated power was 96% for Skylark, 67% for Yellowhammer, 25% for Starling and less than 20% for other species. For the combined sample of arable and pastoral squares, respective figures were 98%, 80% and 34%.

8. Future surveys on the same ASS squares are planned to be carried out in 2008 and 2011. In combination with the standard BBS, this will allow full assessment of the impacts on farmland bird populations of the Entry Level Scheme, especially in arable landscapes.

1. INTRODUCTION

There have been dramatic declines in many farmland bird populations in the UK since the mid-1970s. The Department for Environment, Food and Rural Affairs (Defra) has adopted a Public Service Agreement target that seeks to reverse the decline in farmland birds by 2020. The Farmland Bird Index (FBI), a composite index of 19 farmland bird population trends, will provide the means by which progress towards this target is assessed. Agri-environment schemes are a key delivery mechanism for the target and, in principle, provide most of the resource requirements (nesting and year-round foraging habitats) of the FBI species (Vickery *et al.* 2004). Particularly important amongst these is the new Entry Level Scheme (ELS), which was rolled out across the whole of England in 2005. This scheme aims to encourage a large number of farmers across a wide area of farmland to deliver simple but effective environmental management on their farm. A large number of the ELS management options have been demonstrated, in relatively small-scale field trials, to deliver benefits for birds (Bradbury *et al*. 2004; Stevens & Bradbury 2006) and, if widely adopted, they could form a significant mechanism for addressing the declines of FBI species. ELS is expected to be especially beneficial to the declining species, such as Skylark, Yellowhammer, Linnet, Starling, Reed Bunting and Kestrel, which remain widespread across English farmland and which are likely to respond to an increase in the overall quantity and quality of habitats created and/or managed by the scheme.

The BTO/RSPB/JNCC Breeding Bird Survey (BBS), based on data from random 1-km squares across Britain, provides the basis for the FBI and will therefore be crucial in assessing the success or otherwise of the Entry Level Scheme in reversing farmland bird population declines. The BBS has been running since 1994, covering approximately 2,500 squares annually, although only approximately 1,500 squares are in English lowland farmland. In 2004, a power analysis was carried out on existing BBS data (Freeman *et al*. 2005) to determine with a high degree of certainty whether the current BBS sample was adequate to: (i) detect population changes that may arise due to the implementation of the Entry Level Scheme over the period 2005 to 2011 over all squares; and (ii) detect differences in the trend between survey squares where ELS has been taken up ('ELS squares) and those where it hasn't (non-ELS squares). The analyses indicated that an additional 500 BBS 1-km squares in each of three landscape types (arable, mixed and pastoral) would provide adequate power to detect short-term population changes in the order of 5% over this time period, and differences of 10% between ELS squares and non-ELS squares for two key species – Skylark and Yellowhammer. This sample size is likely to be sufficient to detect changes in populations of at least one of three additional species, Lapwing, Starling and Linnet.

Following this pilot analysis, Defra contracted the BTO to survey approximately 1,000 additional sample survey squares (referred to henceforth as 'ASS squares'), divided equally between arable and pastoral landscapes. The BBS, supplemented by these additional survey squares to ensure adequate power, will provide the opportunity to assess the impact of Entry Level Scheme on farmland bird populations by monitoring bird abundance coincident with implementation of the Entry Level Scheme (in 2005) and post-implementation (2008 and 2011). Using this enlarged BBS data set, the long-term aims are to quantify changes in the abundance of farmland bird species in the total sample of 1-km farmland survey squares in England (core BBS plus ASS squares) between 2005 and 2011, and to assess differences in the estimated population trends in key farmland bird species on land influenced by the Entry Level Scheme and land not influenced by the Entry Level Scheme. These analyses will also be carried out according to the major farming types, arable and pastoral, as the effect of agricultural management strategies may have differing effects according to landscape type (Robinson *et al*. 2001).

The UK leads the way in Agri-Environment Scheme development and monitoring, but as in many countries, monitoring has been criticised due to the lack of rigour, especially before and after comparisons (Kleijn & Sutherland 2003). The project presented here is one of the first to attempt to gather extensive national baseline data. This report summarises the additional data collected in the implementation year, 2005 (note that even though the baseline data were obtained in the 'implementation year', it was before any management was undertaken on the ground), and compares

the geographical coverage achieved and the species richness and individual species occurrence on these additional squares with that from the standard BBS in the same year. This baseline survey will provide invaluable data to assess population trends in the short-term until 2008. The suitability of these data to compare ELS squares and non-ELS squares will depend to a great extent on the nature (scale and location) of Entry Level Scheme uptake and on the availability of additional habitat data within and around survey squares.

2. METHODS

2.1 Survey Square Selection

1,500 1-km grid squares with a minimum of 50% farmland in England were randomly selected, where farmland was defined according to LCM2000 subclasses (www.ceh.ac.uk/sections/seo/documents/leaflet3.pdf1) and consisted of all arable and grassland subclasses. Any squares classified as upland landscape according to Environmental Zones derived from LCM2000 (http://www.defra.gov.uk/wildlife-countryside/cs2000/01/04.htm[1]), were omitted. Arable squares were defined as over 50% of a square covered by any of the three LCM2000 arable subclasses. Pastoral squares were defined as over 50% of a square covered by any of the five LCM2000 grass subclasses. Squares that were currently or had previously been surveyed under the BBS were not included.

Observers were allocated squares from the original 1,500 lowland 1-km squares. To a large extent this allocation was based on the observers location, as most worked from home. However, some areas were targeted for coverage where there were no home-based observers in a given region. In particular, an effort was made to cover regions that had relatively few BBS squares, so the whole sample (BBS+ASS) could be said to be representative of English lowland farmland. ASS square selection was not, therefore, truly random. However, square allocation was always based purely on geographical location rather than any additional habitat selection (outside of the original selection criteria). The initially selected 1,500 squares contained only arable or pastoral squares. A small number of mixed squares (<50% arable and <50% pastoral) were included in the final survey due to initially selected squares having restricted access, or due to habitat changes (e.g. urban development) that rendered them unsuitable for the survey. In such cases, observers were allowed to select, at random, one of the eight adjacent 1-km squares, so long as they were farmland.

Professional fieldworkers were recruited to cover the additional survey squares. Recruitment involved interview, a bird identification field test and a computer-based audio-visual test. Accepted candidates attended a one-day course for training in BBS methods, to ensure that all professional fieldworkers were using the correct methodology. Each fieldworker was provided with a CD of bird songs and calls to aid identification.

2.2 Field Methods

Field methods were identical to BBS methods (Raven *et al*. 2004). In summary, all surveyors made two visits to count birds along a 2 km pre-selected transect route through each 1-km square. All birds seen and heard were recorded in distance bands and in transect sections as for BBS, thereby providing a potential spatial resolution of the data to 200m x 50m, and 200m x 200m, for subsequent analyses as required. Estimates of abundance of all bird species on each 1-km square were estimated from the maximum count, summed over distance bands and transect sections, of the two visits. Comparisons of geographical coverage (by Environmental Zone, farm type and region), survey time duration, species richness and the occurrence and abundance of individual species were carried out between standard BBS squares and the ASS squares.

[1] Accessed at 22/02/2006

3. RESULTS

A total of 975 ASS squares was surveyed by 30 professional field staff in 2005. In addition 1,474 BBS squares covered in 2005 that met the same criteria used for ASS square selection were used as a comparison. The location of BBS and ASS squares surveyed in 2005 are shown in Fig. 1.

3.1 Geographical Coverage

Squares were divided into regions based on the classification used by the BTO to allocate BBS squares to volunteers (these regions correspond roughly to English counties). There were 41 regions with at least one survey square (BBS or ASS). Expected frequencies of ASS squares per region were determined based on the proportion of BBS squares in each region. There were three regions where expected values were less than five: Hereford, Wiltshire South and London. These were combined with, respectively, Worcestershire, Wiltshire North and Essex. χ^2 values were calculated for each region. Coverage for the ELS square survey was generally higher in western and northern England compared to BBS. For example, χ^2 values of greater than 20 was found for Cornwall, Devon, Somerset, Wiltshire and Cumbria. Conversely, ASS coverage was relatively lower in southern regions and particularly the Home Counties. The ASS squares therefore provide additional coverage in areas that are not well covered under the standard BBS. This is clear from Fig. 1, which shows coverage of either ASS or BBS squares over most of lowland England. The major gaps are either due to large urban areas (e.g. London, West Midlands) or upland areas (e.g. Pennines, Lake District).

The proportion of Easterly Lowland squares was roughly equivalent in each sample (Table 1). There was a slightly lower proportion of ASS squares in the Westerly Lowlands compared to BBS (Table 1). There were four BBS squares and two ASS squares where Environmental Zones were unavailable in the LCM2000 database.

The proportion of arable squares in each survey was roughly equivalent (Table 2). ASS squares had greater coverage in pastoral and much lower coverage in mixed farmland compared to BBS (Table 2). The latter result is not surprising as the ASS square selection was targeted at either arable or pastoral landscapes. There was a single ASS square surveyed that was unclassified (30% pasture but over 50% woodland) that does not appear in the totals in Table 2.

3.2 Survey Time

ELS square surveyors took less time than BBS surveyors when combining visit times for both visits (mean ASS = 143 ± 36 minutes, n = 975; mean BBS = 180 ± 60, n = 1227). This difference was significant ($Z = 18.69$, $P < 0.0001$). Note that there were slightly fewer BBS squares in this analysis due to missing survey time data. There were a small number of squares where only one visit was carried out. When these were omitted and visit times were compared for only squares with two visits, the results were very similar (mean ASS = 143 ± 36 minutes, n = 972; mean BBS = 183 ± 59, n = 1185; $Z = 19.77$, $P < 0.0001$).

3.3 Species Richness, Occurrence and Abundance

There was no difference in the total number of species recorded between ASS and BBS squares (mean ASS = 27.38 ± 5.55, n = 975; mean BBS = 27.48 ± 6.73, n = 1474; $Z = 0.38$, ns).

Species-specific analyses were restricted to Farmland Bird Indicator (FBI) species and those that occurred in at least 50% of BBS survey squares. There were seven species that showed a significantly higher occurrence on BBS squares compared to ASS squares (Table 4). These were mostly generalist or non-farmland species (Blue Tit, Magpie, Collared Dove, Mallard, Great Spotted Woodpecker), but also two FBI species, Lapwing and Starling. There were eight species that showed a significantly higher occurrence on ASS squares compared to BBS squares. There was a clear tendency for these species to be more strongly associated with farmland, including Yellow Wagtail, Whitethroat,

Goldfinch, Linnet, Yellowhammer, Stock Dove and Tree Sparrow that are FBI species. Wren also occurred significantly more frequently on ELS squares.

There were 17 species where abundance was significantly greater in the BBS survey (Table 5). Only three species showed a significantly greater abundance on ASS squares. The species in the former group were mainly habitat generalists or non-farmland species (Pheasant, Blue Tit, Carrion Crow, Blackbird, Magpie, Collared Dove, Chaffinch, Great Tit, Song Thrush, Great Spotted Woodpecker, Dunnock, Mallard, House Sparrow, Blackcap). Only three FBI species, Woodpigeon, Greenfinch and Starling, showed significantly higher abundance on BBS squares. Of the three species showing greater abundances on ASS squares, all were farmland specialists that are included in the FBI (Linnet, Tree Sparrow and Stock Dove). Note also that in some cases differences, though significant, were small, as may happen with such large sample sizes. Biological significance may therefore be questionable in some cases. For example, of the significant species, only five (Woodpigeon, Blackbird, Starling, Carrion Crow, Blue Tit) showed a mean difference greater than or equal to two.

4. DISCUSSION

The combined sample of BBS and ASS squares provides a comprehensive coverage of lowland farmland in England. The ASS squares provided survey data from areas where the standard BBS coverage is poor, in particular the southwest and northwest of England. BBS square selection is based on a random stratified sample, where the stratification is by human population size for each region (this is to maximise coverage relative to the number of potential volunteers within a region). The coverage was however generally representative of environmental zones and farm types in England, with the exception of mixed farming landscapes where there were few ASS squares. The original power analysis (Freeman *et al*. 2005) recommended approximately an extra 500 squares was needed in each of the three landscape types. Covering a third landscape type would therefore have significantly increased the costs of the baseline and subsequent surveys. If the impacts of the Entry Level Scheme on mixed farming regions were to be assessed separately based on the current sample, caution should be used in interpreting the results given that the power is likely to be low relative to pastoral and arable landscape change.

Professional fieldworkers took less time on average to survey ASS squares compared to standard BBS squares. The selection procedures and training provided to professionals may have meant that they were more efficient at carrying out the survey. Certainly, the differences in survey time did not have any discernible effect on the number of species detected, the species richness for ASS and BBS squares being virtually identical. There were some differences between the two surveys in terms of occurrence and abundance of individual species however. It was apparent that differences in occurrence in particular were likely to have been caused by some bias in the habitat between ELS and BBS squares rather than differences in identification/ detection between professional surveyors and BBS volunteers. ASS squares tended to have more FBI species than BBS squares which in turn had more waterbirds and woodland/garden species. It is likely that the geographically non-random distribution of ASS and BBS squares caused these differences, in particular, the greater proportion of BBS squares towards more populated areas. BBS squares had a significantly greater cover of urban land (according to LCM2000) than ASS squares (mean BBS = 6.78 ± 9.21%, n = 1474; mean ASS = 4.92 ± 7.48%, n = 975; $Z = 5.48$, $P < 0.01$). Such biases are of little importance when change over time is the key measure of interest, so long as the errors are constant. Moreover, the differences detected illustrate the effect of the underlying stratification of the BBS selection procedure, which is linked to human population size in each region (this is due to a purely practical reason in that more volunteer BBS surveyors are available in more populated regions). The targeting of ASS squares effectively redresses this balance and ensures a thoroughly representative survey (albeit with an intentional bias away from mixed farmland) of lowland farmland in England.

Power analysis based on assumptions of likely effects of the Entry Level Scheme suggested that 1,000 squares in each landscape type would provide adequate power to detect a population change of 10% between 2005 and 2011 in Skylark and Yellowhammer and one or more of Lapwing, Starling and Linnet (Freeman *et al*. 2005). There was a total of 1119 arable squares and 816 pastoral squares for the combined BBS and ASS sample (Table 2). New power analyses based on these combined samples were performed using the methodology of Freeman *et al*. (2005). In pastoral landscapes, estimated power to detect population change was 51% for Skylark, 28% for Yellowhammer and 27% for Starling. For other species power was less than 20%. In arable landscapes, estimated power was 96% for Skylark, 67% for Yellowhammer, 25% for Starling and less than 20% for other species. Furthermore, for the combined sample of arable and pastoral squares, estimated power was 98% for Skylark, 80% for Yellowhammer, 34% for Starling and 29% for Linnet. Therefore, Skylark and Yellowhammer are still very likely to show significant change over time in arable landscapes and across both arable and pastoral landscapes if there are impacts at the scale anticipated of the Entry Level Scheme on their populations. However, our confidence to detect population changes is less in pastoral landscapes.

Future surveys on the same ASS squares, and indeed using exactly the same survey routes and transect sections, are planned to be carried out in 2008 and 2011. In combination with the standard

BBS, this will allow full assessment of the impacts on farmland bird populations of the Entry Level Scheme, especially in arable landscapes. It is also hoped that spatially referenced data detailing the uptake of the Entry Level Scheme will be available so that population change can be compared between squares where the Entry Level Scheme has been implemented and those where it has not.

Recommendations

1. Additional surveys on the same squares should be carried out in 2008 and 2011 in order to assess the broad-scale impacts of the Entry Level Scheme on bird populations.
2. Spatially referenced data is required on Entry Level Scheme uptake in order to assess: (i) differences in bird population trends between ELS and non-ELS squares; (ii) the effects of different Entry Level Scheme options on bird population trends, and (iii) the influence of scale of uptake at a landscape scale (e.g. 3x3km centred on the survey square) on bird population trends.

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Table 1. The number of BBS and ASS squares surveyed in different Environmental Zones in 2005 and the proportion these contribute to the total coverage (n = 1,470 BBS, 975 ASS). Note that there were four BBS squares that were unclassified. Column values cannot be tested alone, but are given to illustrate where there are large deviations from the proportion of total squares in the BBS sample. Total $\chi^2_1 = 8.06$, $P < 0.001$.

Zone	BBS squares	Proportion of total BBS	ASS squares	Proportion of total ASS	Chi
Easterly Lowlands	868	0.59	531	0.54	3.24
Westerly Lowlands	602	0.41	442	0.45	4.82

Table 2. The number of BBS and ASS squares surveyed in different farming types (defined according to LCM2000 landcover data) in 2005 and the proportion these contribute to the total coverage (n = 1,474 BBS, 975 ASS). Column values cannot be tested alone, but are given to illustrate where there are large deviations from the proportion of total squares in the BBS sample. Total $\chi^2_2 = 213.21$, $P < 0.0001$.

Farm type	BBS squares	Proportion of total BBS	ASS squares	Proportion of total ASS	Chi
Arable	643	0.44	476	0.49	6.04
Mixed	425	0.29	88	0.09	132.67
Pastoral	406	0.28	410	0.42	74.50

Table 3. The number of BBS and ASS squares surveyed in different regions of England (BTO-defined) in 2005 and the proportion these contribute to the total coverage (n = 1,474 BBS, 975 ASS). χ^2 measures deviance from the expected proportion based on the BBS sample. Column values cannot be tested alone, but are given to illustrate where there are large deviations from the proportion of total squares in the BBS sample. Total $\chi^2_{37} = 534.32$, $P < 0.0001$.

Region	BBS squares	Proportion of total BBS	ASS squares	Proportion of total ASS	Chi
Avon	77	0.05	16	0.02	23.96
Birmingham	52	0.04	40	0.04	0.91
Bucks	34	0.02	6	0.01	12.09
Cheshire	58	0.04	34	0.03	0.50
Cornwall	12	0.01	33	0.03	79.13
Cumbria	18	0.01	41	0.04	71.09
Derbys	22	0.01	12	0.01	0.45
Devon	59	0.04	73	0.07	29.57
Dorset	32	0.02	22	0.02	0.03
Durham	20	0.01	3	0.00	7.91
Essex & London	36	0.02	41	0.04	12.41
Glos.	33	0.02	18	0.02	0.67
Hants	52	0.04	24	0.02	3.14
Herts	103	0.07	24	0.02	28.59
Hereford & Worcester	50	0.03	18	0.02	6.87
Huntingdon	48	0.03	47	0.05	7.32
Kent	59	0.04	6	0.01	27.95
Lancs	17	0.01	21	0.02	8.46
Leics	26	0.02	25	0.03	3.54
Lincs East	11	0.01	17	0.02	13.00
Lincs North	8	0.01	3	0.00	0.99
Lincs South	14	0.01	15	0.02	3.56
Lincs West	15	0.01	15	0.02	2.60
Manchester	39	0.03	13	0.01	6.35
Northumberland	27	0.02	26	0.03	3.71
Northants	16	0.01	17	0.02	3.89
Norfolk	51	0.03	54	0.06	12.17
Notts	44	0.03	13	0.01	8.91
Oxon	123	0.08	32	0.03	29.95
Shrops	37	0.03	25	0.03	0.01
Somerset	22	0.01	37	0.04	34.63
Suffolk	46	0.03	51	0.05	13.91
Surrey	30	0.02	5	0.01	11.10
Sussex	82	0.06	27	0.03	13.68
Wilts	21	0.01	32	0.03	23.61
Yorks Central	38	0.03	44	0.05	14.16
Yorks East	32	0.02	38	0.04	13.39
Yorks North	10	0.01	7	0.01	0.02

Table 4. The occurrence rate of individual species in BBS and ASS survey squares in 2005. Proportions are determined relative to the whole sample for each survey (n = 1,474 BBS squares, 975 ASS squares). Only species that are either in the Farmland Bird Indicator (in bold), or that have a higher than 0.50 occurrence rate on BBS squares are shown. Species are given in order of occurrence rate on BBS squares. χ^2 values derived from 2 x 2 contingency tables. * P < 0.05, ** P < 0.01, otherwise not significant.

Species	BBS	ASS	χ^2
Woodpigeon	0.99	1.00	2.13
Blackbird	0.99	0.98	1.64
Chaffinch	0.99	0.99	1.47
Blue Tit	0.95	0.93	4.33*
Carrion Crow	0.95	0.94	0.32
Wren	0.95	0.97	5.88*
Robin	0.94	0.94	0.07
Great Tit	0.92	0.91	1.16
Dunnock	0.90	0.92	2.78
Pheasant	0.88	0.89	0.35
Greenfinch	0.84	0.84	0.02
Song Thrush	0.80	0.77	2.84
Magpie	0.79	0.74	8.98**
Skylark	0.79	0.81	0.74
Blackcap	0.73	0.75	1.10
Starling	0.72	0.67	7.75**
Jackdaw	0.72	0.75	2.71
Whitethroat	0.69	0.75	8.58**
Goldfinch	0.69	0.74	8.04**
House Sparrow	0.67	0.65	1.46
Chiffchaff	0.65	0.65	0.00
Yellowhammer	0.65	0.71	8.04**
Collared Dove	0.63	0.52	27.03**
Mallard	0.58	0.47	31.94**
Rook	0.58	0.61	1.61
Pied Wagtail	0.56	0.58	1.54
Linnet	0.55	0.68	38.77**
Great Spotted Woodpecker	0.51	0.44	10.30**
Stock Dove	0.40	0.55	47.73**
Kestrel	0.35	0.32	1.57
Lapwing	0.34	0.28	7.46**
Grey Partridge	0.13	0.12	0.52
Turtle Dove	0.10	0.10	0.06
Yellow Wagtail	0.09	0.14	12.19**
Corn Bunting	0.08	0.09	0.34
Tree Sparrow	0.08	0.15	28.90**

Table 5. The mean (±SD) abundance of individual species in BBS and ASS survey squares in 2005. Abundance is based on the maximum count taken on each square over two visits. Sample sizes were n = 1,474 BBS squares, 975 ASS squares. Only species that are either in the Farmland Bird Indicator (in bold), or that have a higher than 0.50 occurrence rate on BBS squares (Table 4) are shown. Species are given in order of abundance on BBS squares. Z values test the difference between means. * P < 0.05, ** P < 0.01, otherwise not significant.

Species	BBS	ASS	Z
Woodpigeon	36.108 ± 31.925	32.353 ± 33.828	2.754**
Rook	16.794 ± 39.717	15.042 ± 38.333	1.093
Blackbird	15.144 ± 9.722	11.813 ± 7.086	9.816**
Starling	15.021 ± 26.643	10.770 ± 27.099	3.831**
Chaffinch	14.902 ± 8.503	13.677 ± 6.937	3.914**
Carrion Crow	12.931 ± 14.894	9.104 ± 9.404	7.810**
Blue Tit	10.599 ± 8.225	7.957 ± 5.844	9.306**
Wren	10.259 ± 7.190	10.565 ± 6.786	1.068
House Sparrow	10.052 ± 15.208	8.679 ± 13.065	2.387*
Jackdaw	9.981 ± 15.866	9.884 ± 15.905	0.153
Robin	7.896 ± 5.823	8.129 ± 3.086	0.944
Skylark	7.166 ± 8.727	7.459 ± 8.128	0.849
Greenfinch	7.091 ± 7.553	6.096 ± 6.335	3.525**
Great Tit	6.477 ± 5.362	5.335 ± 4.162	5.927**
Pheasant	6.083 ± 6.628	5.225 ± 5.449	3.503**
Dunnock	4.829 ± 3.987	4.342 ± 3.302	3.295**
Magpie	4.137 ± 4.482	2.806 ± 3.137	8.662**
Mallard	4.072 ± 7.982	2.419 ± 4.520	6.544**
Yellowhammer	3.790 ± 5.409	3.930 ± 4.641	0.687
Linnet	3.752 ± 6.489	4.687 ± 7.647	3.148**
Goldfinch	3.594 ± 4.555	3.836 ± 4.165	1.358
Song Thrush	3.498 ± 3.402	2.727 ± 2.652	6.290**
Collared Dove	3.368 ± 5.088	1.992 ± 3.074	8.354**
Whitethroat	2.915 ± 3.365	2.870 ± 3.016	0.349
Blackcap	2.799 ± 2.998	2.555 ± 2.824	2.049*
Chiffchaff	2.463 ± 3.013	2.371 ± 2.918	0.755
Lapwing	2.425 ± 9.356	1.901 ± 6.883	1.599
Stock Dove	1.520 ± 2.902	2.203 ± 3.601	4.961**
Pied Wagtail	1.281 ± 1.697	1.334 ± 1.632	0.783
Great Spotted Woodpecker	1.133 ± 1.618	0.810 ± 1.209	5.644**
Kestrel	0.509 ± 0.836	0.470 ± 0.826	1.150
Tree Sparrow	0.399 ± 1.906	0.640 ± 2.174	2.826**
Grey Partridge	0.368 ± 1.290	0.286 ± 0.915	1.848
Corn Bunting	0.352 ± 1.854	0.350 ± 1.492	0.036
Yellow Wagtail	0.288 ± 1.276	0.368 ± 1.236	1.563
Turtle Dove	0.197 ± 0.776	0.170 ± 0.628	0.927

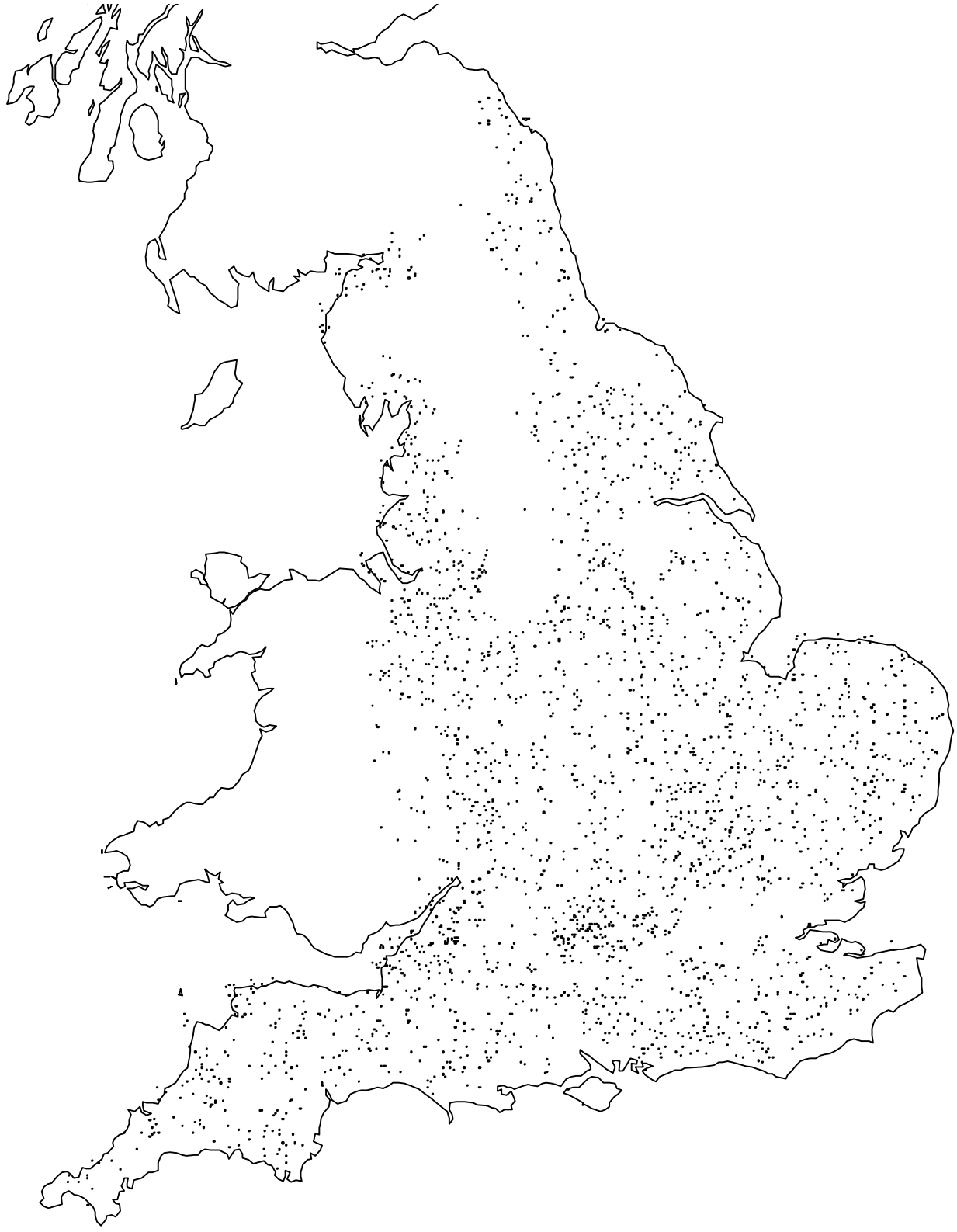

Figure 1. ASS (red) and BBS (green) squares surveyed in 2005.