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AN ASSESSMENT OF BIRD POPULATIONS IN SELECTED FOREST PLOTS: A CONTRIBUTION TO THE BIODIVERSITY RESEARCH PROGRAMME

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EXECUTIVE SUMMARY

1. **An assessment of bird numbers in commercial forestry was undertaken in the spring and summer of 1996 by the British Trust for Ornithology as a contribution to the Forestry Commission Research Division Biodiversity Research Programme. Point counts and a simplified territory mapping method were used to record birds within 12 commercial forests throughout England and Scotland. Within each forest, sample plots were established within forest stands of different ages (pre-thicket, mid-rotation, mature and over mature). The data collected were used to calculate bird numbers, density and diversity within each of the sample plots. The results of these analyses were used to investigate differences in bird assemblages between growth stages.**

2. **In total over 770 individual birds of 39 species were recorded in the 43 forest plots. The number of birds recorded and the species composition of the plots varied greatly. Although not significant, the highest number of birds and species were recorded in the younger forest growth stages, however, species diversity tended to be higher in the oldest forest plots. There was variation and much overlap between growth stages in species number, total individuals and diversity. Only three species appeared to show associations with forest stands of different ages. The most extreme example of this was Willow Warbler, where 84% of the birds recorded were associated with the youngest growth stage.**

3. **Detrended correspondence analysis of the data indicates that early forest growth stages (pre-thicket) support bird assemblages which differ from those found in the later growth stages. It appears that lowland pre-thicket assemblages may differ considerably from those of upland pre-thicket assemblages and further work on this is suggested. There as no clear distinction of bird assemblages between mid-rotation, mature and over-mature growth stages. Different bird species have clear habitat requirements in terms of the different successional stages of forest growth and this was also demonstrated clearly by the DCA.**

4. **Although producing some interesting results the data have some limitations, principally, the size of the sampling area may have been too small to record some species and nocturnal/crepuscular species were under-recorded. The absence of replicates of growth stages within each forest is also discussed.**

1. INTRODUCTION

1.1 Background

This report presents the results of an assessment of avian biodiversity within managed stands of commercial forestry and forms part of a much wider Biodiversity Research Programme (BRP) organised by the Forestry Commission Research Division. The BRP has been established to provide baseline data for a range of forest plot/species types and to identify key biodiversity indicators for future monitoring. The BRP falls within the Forestry Commission Research Division Biodiversity Initiative, which has the dual aims of enhancing biodiversity in British plantation forests and producing standards for biodiversity in plantation forests. The British Trust for Ornithology was commissioned to undertake counts of birds within each of the BRP plots during 1996. The specific aims of these bird counts were:

(1) to provide baseline data that could be used to explore patterns in bird numbers and bird species composition among stands differing in tree species and growth stage;

(2) to provide data on the relative abundance of bird species that could be used by the Forestry Commission Research Division, in combination with data from other taxa, to make appraisals of patterns in biodiversity within forests.

The primary aims were the provision of data to meet the above objectives. However, this report includes some preliminary analyses of data to describe general patterns. The results and discussion also consider the scope for further analyses of the data and wider development of the study.

1.2 Breeding bird assemblages in coniferous forests

The use made of coniferous forests is dealt with in depth by Avery & Leslie (1990), Petty & Avery (1990) and Fuller (1995) and only a summary is provided here of current understanding.

There is much regional variation in forest bird assemblages and the birdlife within plantations is dynamic, constantly changing with the structural development of the stand. Nonetheless, at the simplest level, the birdlife of coniferous forests can be effectively divided into two assemblages. The first assemblage typifies the establishment and pre-thicket stages of forest development. The second bird assemblage develops after the forest canopy closes, usually during the later part of the pre-thicket stage. The birds associated with the very earliest stages of forest growth are those which generally favour open habitats, and are usually ground nesting and insectivorous species (such as Nightjar, Skylark, Woodlark, Meadow Pipit and Tree Pipit). With increasing tree growth, these birds are supplemented by and in some cases replaced by species which favour scrub, most notably Willow Warbler. During the later stages of the pre-thicket stage, species which are associated with closed canopy move in (e.g. Coal Tit and Chaffinch). By the late thicket stage most of the bird species present in the earlier stages have been replaced by species such as Siskin, Crossbill, Goldcrest, Chaffinch and Coal Tit. This generalised picture probably holds true for the majority of Britain's coniferous forests and is broadly supported by the results of this study. However, the precise species composition of each forest stage varies with differing latitude, topography and climate. Bird species composition also varies depending on the species of tree grown within the forest.

2. METHODS

2.1 Data collection

Twelve commercial coniferous forests were selected by Forestry Commission Research Division staff in upland, lowland and foothill locations of England and Scotland as part of the BRP. At all of the forest locations a single 1ha sampling plot was established in species-specific coniferous stands of three different ages (chronosequences), namely pre-thicket (11-20 yrs), mid-rotation (21-60 yrs) and mature (60+ yrs). Additionally a fourth sampling plot was established within some of the forests in over-mature stands. The topography, tree species and chronosequence involved in each of the BRP plots are given in Table 2.1. Approximate locations are shown in Figure 2.1.

The BRP plots consist of 1 ha quadrats positioned within stands selected according to tree species and growth stage. The status of several taxonomic groups is being studied within these plots and it is inevitable that the scale of the study areas is not ideal for all the groups. This is probably especially true for the birds - a 1 ha sample will contain rather few individuals and many birds occupy territories that extend over areas considerably larger than 1 ha. Therefore, it was considered highly desirable to increase the size of the bird study area. This was achieved by establishing a 30 m 'buffer zone' around the 1 hectare plot which increased the size of the study area to 2.56 ha. The original 1 ha quadrat is subsequently referred to as the *core plot* and the extended area of 2.56 ha is referred to as the *whole plot*.

Bird data were collected at five point count locations (Bibby *et al*. 1992), which were established at each plot using a standardised pattern (Figure 2.2). Hence, on each visit counts were carried out at five different locations at each site. Each point count was of 10 minutes duration which Fuller & Langslow (1984) recommended as the maximum duration of counts under British conditions. Bird registrations were categorised as either less than or greater than 30 m from the point count location. Territory mapping (Bibby *et al.* 1992) along a standardised route was also used to collect bird data, which were combined with the point count data to maximise the amount of information which could be obtained from each plot. The route used for the territory mapping was standardised for all plots and ensured that all parts of the plot were approached to within 50 m. Each plot was visited twice between April 1996 and June 1996.

The over-mature plot at Kielder was not visited owing to the presence of breeding Goshawks, which were considered too prone to disturbance.

2.2 Data presentation and analysis

The data collected by the point counts were used to calculate the mean count of each species for the five count locations. In calculating the mean count, the highest count was taken from each count location irrespective of which visit it was made on. The data collected within 30 m of each point count location was used to calculate the density of individuals at each plot (area=(πr^2)=0.28ha (r=30 m)). In addition, the point count data were used to calculate the total number and total density of individuals and the total number of species at each plot. Data are presented for each of the chronosequences separately. The proportion of individuals for each of the 10 most numerous species recorded in the various stages within each of the chronosequences are compared to establish if a particular species associates with a particular growth stage.

The data collected by territory mapping were used to estimate the number and density of territories for each species within the core plot (and the whole plot). This was also based on the maximum count for each species from either of the two visits. The territory mapping data were also used to calculate the total number of territories and the total number of species present within the core and whole plot. Data are presented separately for each chronosequence. Note that this is not conventional territory mapping which typically involves making eight to ten visits to a plot. The

estimates of bird numbers derived from both point count and mapping as used in this study cannot be treated as absolute estimates.

Shannon diversity indices were calculated using the point count and territory mapping data. The Shannon diversity index (H) is calculated using the formula:

$$H = -\sum P_i \ln P_i$$

Where *H* describes the diversity of the bird community and P_i is the proportion represented by an individual species within the community.

3. RESULTS & DISCUSSION

In total over 770 individuals of 39 species were recorded in the 43 forest plots. The 39 species recorded represent approximately one third of the bird species known to breed in woodland (Fuller 1995). The raw counts are presented in Appendices 1 and 2.

3.1 Point counts

The mean number and density of each species recorded by the point counts at each of the BRP plots are given in Appendix 1. The mean number and density of birds varied greatly between each of the plots. The mean number of birds ranged between 0.2 and 3.2 birds per plot and density ranged between 0.71 to 11.53 birds per hectare (Appendix 1). The number of species recorded in each plot varied from one to 15 (Table 3.1) and the number of individuals in each plot ranged from two to 60 (Table 3.1). On average the highest number of species and individuals were recorded in the pre-thicket and over-mature plots though Kinskal-Wallis tests showed that these differences were not significant (Table 3.1, Figures 3.1 & 3.2). This was also apparent with the total density of birds (Table 3.1). The number of individuals and species recorded in each chronosequence growth stage, at each forest plot are shown in Figures 3.3 and 3.4. Although very similar across the growth stages, the highest mean diversity index was recorded in the over-mature plots, although again diversity did not differ significantly across stages (Figure 3.5). The widest range of diversity indices was recorded in the pre-thicket plots (Figure 3.5). There was very substantial variation within, and overlap between, each growth stage in numbers of species, individuals, total density and diversity.

The most commonly recorded species were Chaffinch and Coal Tit, for each of which 117 individuals were recorded in 34 (79%) of the BRP plots (Table 3.2). The total number of individuals of other species and the number of plots in which they were found are given in Table 3.2. Of the 10 most numerous species recorded, only Goldcrest, Woodpigeon and Willow Warbler showed an association with forest age (Figure 3.6). Willow Warbler showed the strongest association, with 84% of the birds recorded being present in the pre-thicket stage (Figure 3.6). Woodpigeon and Goldcrest were most abundant in mid-rotation sites.

3.2 Territory mapping

The number of territories recorded for each species and territory density in both the whole and core plot are given in Appendix 2. As with the point counts the number of territories and territory density varied between the different BRP plots. The total number of species, the total number of territories, total territory density and a diversity index for the whole and core plot are given in Table 3.3. In common with the point counts the highest number of species, territories and diversity indices were recorded in the pre-thicket and over-mature plots, however Kruskal-Wallis tests showed that the differences were not significant (Table 3.3, Figures 3.1 & 3.3). There was also considerable variation within growth stages and overlap between them in species number, individuals, total density and diversity. The number of territories and species recorded in each chronosequence growth stage, at each forest plot are shown in Figures 3.3 and 3.4. The most abundant species throughout all of the plots was Chaffinch, with 123 territories being recorded in 36 (84%) plots (Table 3.4). Coal Tits were slightly less abundant (120 territories) but slightly more widespread, being found in 37 plots (86%) (Table 3.4). The total number of territories recorded for the other species and the number of plots which held territories of each species are given in Table 3.4.

3.3 Patterns in bird assemblages: an indicative analysis

The project was not designed with the intention of collecting a data set that would provide a large detailed data set on habitat associations of birds within forests. Nonetheless it is instructive to undertake a multivariate analysis of the matrix of bird counts and plots. This was undertaken by

Detrended Correspondence Analysis (DCA) using the DECORANA program (Gauch 1982) without downweighting for rare species. The data used in this analysis were the mean counts of each species from the five point count locations within each plot. Ordination by DCA allows samples, here individual plots, to be arranged in a space defined by four axes representing independent gradients in bird species composition. Hence, plots that are close together in the ordination space hold similar bird assemblages and ones that are far apart are dissimilar in their assemblages.

The axes are of decreasing importance in terms of the variation accounted for in the bird assemblages. The eigenvalues were 0.624, 0.332, 0.157 and 0.105 for the four axes. Hence axes 1 and 2 represented relatively strong gradients. Figure 3.7 shows the relative locations of the 43 individual plots on DCA axes 1 and 2. Axis 1 appears to represent a 'successional' gradient because it clearly separates most of the pre-thicket plots from the older plots. Interestingly, the results suggest that there may be differences in pre-thicket assemblages between lowland and upland forests. The pre-thicket stages of Thetford Forest, New Forest, Fineshade and Forest of Dean held assemblages that were more similar to those of older stages than was the case for the pre-thicket plots in the other forests. The Sherwood and one of the Thetford pre-thicket plots did not, however, fit with this pattern for their bird assemblages were similar to those in the upland pre-thicket plots. There was large overlap between the mid-rotation, mature and over-mature plots in their bird assemblages. We are unable to offer a clear interpretation of axis 2 though it is worth noting that the three oldest stages of Glen Affric, the most northerly forest examined, achieve high scores on this axis. Furthermore, most of the overmature plots attain high scores on axis 2.

DCA also permits individual species to be plotted in ordination space and this is done in Figure 3.8. Species that are close together occur in similar suites of plots while ones that are far apart have rather different patterns of distribution across plots. As one might expect, axis 1 of the ordination tends to separate species associated with open areas within forest stands (e.g. Linnet, Yellowhammer, Tree Pipit) from ones associated with mature trees (e.g. Crossbill, Great Spotted Woodpecker, Treecreeper). Hole-nesting birds tend to score low values on axis 1. Species requiring bushy vegetation or dense undergrowth tend to occur in the middle of axis 1 - for example Willow Warbler, Dunnock, Chiffchaff, Blackcap.

3.4 Some comments on interpretation

The primary purpose of this project was to collect indicative baseline data for a study of biodiversity within the forest environment. The methods used were clearly defined and readily repeatable so that future trends in bird assemblages could be established at the study areas if desired.

A limitation for purposes of biodiversity assessment is that the study areas were of insufficient size to determine avian species richness within stand types. This was the case even after the study areas were extended beyond the core areas. It is also probable that not all species that use the study plots would have been detected during the fieldwork visits. This is most likely to be true for wide-ranging species or ones with large territories (e.g. crossbills, corvids, birds of prey). Nocturnal or crepuscular species would also be poorly sampled by this method (notably owls, Nightjar, Grasshopper Warbler). The data are likely, however, to be relatively robust for the majority of small passerines. Two exceptions to this are Skylark and Whinchat, both characteristic species of pre-thicket plantations (Fuller 1995) neither of which were recorded in this study. This is a consequence of the small sample areas employed. Populations of Whinchats in pre-thicket plantations may be of national importance so it is unfortunate that this species does not feature in the biodiversity database.

One further aspect of study design that should be borne in mind when interpreting these data is the lack of replicates within individual forest areas. It is clear from the bird counts that there can be considerable variation between plots that are located within the same stage of growth (Figures 3.1-

3.5). Unfortunately it is difficult to draw firm conclusions about differences *between* forests because nothing is known about variability *within* forests. Results from individual points cannot be used to assess this variability because each point represents such a small sample.

Despite the above comments, the data presented here can be used to undertake indicative analyses of patterns in bird assemblages such as those presented in Figures 3.7 and 3.8. These analyses are useful in highlighting several aspects worthy of future study. In particular the differences that may exist in the bird communities of upland and lowland pre-thicket stands.

4. REFERENCES

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Forest	Topography	Tree Species	Chronosequences			
			1. Pre-thicket	2. Mid-rotation	3. Mature	4. Over-Mature
1. Affric	Foothills	Scots Pine	✓	✓	✓	✓
2. Strathspey	Foothills	Scots Pine	✓	✓	✓	✓
3. Thetford	Lowland	Corsican Pine	✓	✓	✓	
4. New Forest	Lowland	Scots Pine	✓	✓	✓	✓
5. Knapdale	Upland	Sitka Spruce	✓	✓	✓	✓
6. Clunes	Upland	Sitka Spruce	✓	✓	✓	✓
7. F. of Dean	Lowland	Norway Spruce	✓	✓	✓	
8. Fineshade	Lowland	Norway Spruce	✓	✓	✓	
9. Kielder	Foothills	Sitka Spruce	✓	✓	✓	✓
10. Glentress	Foothills	Sitka Spruce	✓	✓	✓	✓
11. Thetford	Lowland	Corsican Pine	✓	✓	✓	✓
12. Sherwood	Lowland	Corsican Pine	✓	✓	✓	

Table 2.1 **The location, topography, tree species and chronosequence growth stages sampled at each of the BRP plots. Note that subsequent numbering of forestry plots consists of forest number followed by chronosequence number so that, for example, the mature plot at Knapdale is 5.3.**

Table 3.1 **The number of bird species, total number of individual birds, diversity index (H) and the total density of birds recorded at the five point count locations at each forestry plot.**

Plot	Number of Species	Total Number of Birds	Diversity Index (H)	Total Density (ha^{-1})
1.1	2	10	0.5004	7.0922
1.2	3	6	1.0114	4.2553
1.3	6	10	1.6957	7.0922
1.4	5	8	1.5596	5.6738
2.1	4	10	0.9405	7.0922
2.2	6	15	1.4878	10.6383
2.3	1	2	0	1.4184
2.4	5	15	1.2868	10.6383
3.1	11	30	2.1655	21.2766
3.2	5	14	1.3316	9.9291
3.3	6	28	1.4651	19.8582
4.1	8	16	1.9274	11.3475
4.2	6	21	1.6624	14.8936
4.3	7	27	1.7032	19.1489
4.4	12	39	2.3394	27.6596
5.1	4	12	1.1988	8.5106
5.2	3	4	1.0397	2.8369
5.3	3	5	1.0549	3.5461
5.4	7	14	1.7298	9.9291
6.1	2	7	0.5983	4.9645
6.2	4	7	1.3518	4.9645
6.3	6	9	1.6770	6.3830
6.4	7	13	1.8848	9.2199
7.1	13	32	2.3961	22.6950
7.2	6	18	1.4751	12.7660
7.3	9	23	2.0544	16.3121

Plot	Number of Species	Total Number of Birds	Diversity Index (H)	Total Density (ha^{-1})
8.1	15	60	2.4161	42.5532
8.2	9	25	1.9334	17.7305
8.3	6	24	1.6046	17.0213
9.1	2	7	0.5983	4.9645
9.2	5	27	1.4026	19.1489
9.3	7	18	1.7249	12.7660
10.1	6	15	1.4142	10.6383
10.2	8	19	1.8678	13.4752
10.3	6	19	1.6008	13.4752
10.4	6	26	1.4327	18.4397
11.1	10	39	1.8529	27.6596
11.2	6	20	1.5099	14.1844
11.3	4	12	0.9831	8.5106
11.4	5	7	1.5498	4.9645
12.1	7	31	1.4885	21.9858
12.2	6	14	1.5692	9.9291
12.3	5	7	1.4751	4.9645

Table 3.1 continued

Table 3.2 **The total number of each species and the number and percentage of plots where each species was recorded based on point counts.**

Species	Total number of birds	Number of plots with species present (%)
Blackbird	19	11 (26)
Blackcap	6	4 (9)
Blue Tit	18	12 (28)
Brambling	2	2 (5)
Bullfinch	1	1 (2)
Buzzard	1	1 (2)
Carrion Crow	1	1 (2)
Chaffinch	117	34 (79)
Chiffchaff	6	4 (9)
Coal Tit	117	34 (79)
Crested Tit	2	1 (2)
Crossbill	15	2 (5)
Cuckoo	1	1 (2)
Dunnock	3	2 (5)
Goldcrest	72	26 (61)
Goldfinch	1	1 (2)
Grasshopper Warbler	1	1 (2)
Great Tit	5	3 (7)
Great-spotted Woodpecker	1	1 (2)
Greenfinch	1	1 (2)
Linnet	2	1 (2)
Long-tailed Tit	13	3 (7)
Magpie	1	1 (2)
Mallard	2	1 (2)
Marsh Tit	1	1 (2)
Redpoll	14	2 (5)

Species	Total number of birds	Number of plots with species present (%)
Robin	52	24 (56)
Siskin	49	12 (28)
Song Thrush	7	6 (14)
Stock Dove	2	1 (2)
Tree Pipit	10	7 (16)
Treecreeper	7	4 (9)
Turtle Dove	2	1 (2)
Willow Warbler	104	17 (40)
Woodpigeon	32	12 (28)
Wren	67	26 (60)
Yellowhammer	10	2 (5)

Table 3.2 continued

Table 3.3 **The total number of species, total number of territories and total territory density in the core and whole plot based on mapping.**

Plot	Number of Species		Number of Territores, Whole Plot	Territory Density (per ha)		Diversity Index (H)	
	Core	Whole Plot		Core (also number of territories)	Whole Plot	Core Plot	Whole Plot
1.1	2	3	11	4	4.2969	0.5624	0.7595
1.2	3	5	9	4	3.5156	1.0397	1.5811
1.3	6	8	15	9	5.8594	1.7352	1.9914
1.4	6	8	17	7	6.6406	1.7478	1.9214
2.1	3	5	14	7	5.4688	0.7963	1.1275
2.2	2	5	14	2	5.4688	0.6932	1.3691
2.3	1	6	11	2	4.2969	0	1.6726
2.4	2	5	12	4	4.6875	0.5624	1.4242
3.1	7	11	26	11	10.1563	1.8462	2.1183
3.2	3	5	12	5	4.6875	0.9503	1.3522
3.3	5	8	27	12	10.5469	1.3579	1.6686
4.1	5	10	24	6	9.3750	1.5607	2.0813
4.2	4	9	26	5	10.1563	1.3322	2.0247
4.3	7	9	31	14	12.1094	1.8338	1.9633
4.4	11	14	34	20	13.2813	2.1548	2.3947
5.1	3	5	11	6	4.2969	1.0114	1.5157
5.2	3	4	9	3	3.5156	1.0986	1.1491
5.3	2	5	10	2	3.9063	0.6932	1.5048
5.4	6	7	20	10	7.8125	1.6957	1.8174
6.1	3	3	9	6	3.5156	1.0114	0.9951
6.2	3	6	10	3	3.9063	1.0986	1.6094
6.3	5	7	16	10	6.2500	1.5571	1.8407
6.4	5	8	15	8	5.8594	1.4942	1.8989
7.1	14	14	34	20	13.2813	2.5537	2.4688

Plot	Number of Species		Number of Territores, Whole Plot	Territory Density (per ha)		Diversity Index (H)	
	Core	Whole Plot		Core (also number of territories)	Whole Plot	Core Plot	Whole Plot
7.2	5	8	23	11	8.9844	1.5466	1.9596
7.3	8	10	26	13	10.1563	1.9915	2.2152
8.1	11	14	40	22	15.6250	2.2005	2.4042
8.2	9	12	36	16	14.0625	1.8346	2.1362
8.3	5	6	21	12	8.2031	1.4242	1.5917
9.1	4	4	11	4	4.2969	1.3863	0.8856
9.2	6	6	18	9	7.0313	1.7352	1.5655
9.3	3	4	7	3	2.7344	1.0986	1.2771
10.1	1	4	12	4	4.6875	0	0.9831
10.2	2	9	21	4	8.2031	0.6932	1.8637
10.3	6	6	13	7	5.0781	1.7478	1.6977
10.4	7	8	17	7	6.6406	1.9459	1.9869
11.1	10	11	31	16	12.1094	2.0141	2.0296
11.2	4	4	9	5	3.5156	1.3322	1.3108
11.3	2	5	9	2	3.5156	0.6932	1.4271
11.4	3	7	13	4	5.0781	1.0397	1.7783
12.1	4	6	19	7	7.4219	1.2771	1.3856
12.2	2	6	10	2	3.9063	0.6932	1.6957
12.3	2	5	8	2	3.1250	0.6932	1.5596

Table 3.3 continued

Table 3.4 **The total number of territories and the number and percentage of plots where each species was recorded.**

Species	Total number of birds	Number of plots with species present (%)
Blackbird	19	12 (28)
Blackcap	7	5 (12)
Blue Tit	18	11 (26)
Brambling	1	1 (2)
Bullfinch	1	1 (2)
Buzzard	3	2 (5)
Chaffinch	123	36 (84)
Chiffchaff	6	4 (9)
Coal Tit	120	37 (86)
Crossbill	6	3 (7)
Cuckoo	1	1 (2)
Dunnock	3	2 (5)
Garden Warbler	1	1 (2)
Goldcrest	70	30 (70)
Goldfinch	1	1 (2)
Grasshopper Warbler	1	1 (2)
Great Tit	4	3 (7)
Great-spotted Woodpecker	3	3 (7)
Green Woodpecker	2	1 (2)
Greenfinch	2	1 (2)
Linnet	3	1 (2)
Long-tailed Tit	6	3 (7)
Magpie	2	2 (5)
Mallard	1	1 (2)
Marsh Tit	1	1 (2)
Nuthatch	1	1 (2)

Species	Total number of birds	Number of plots with species present (%)
Redpoll	9	3 (7)
Robin	60	26 (60)
Siskin	45	22 (51)
Song Thrush	6	5 (12)
Tree Pipit	10	6 (14)
Treecreeper	12	8 (19)
Turtle Dove	2	1 (2)
Willow Warbler	86	16 (37)
Woodpigeon	49	17 (40)
Wren	68	32 (74)
Yellowhammer	7	2 (5)

Table 3.4 continued

Appendix 1 **The mean number per point and density (mean number ha^{-1}) of each species of bird recorded at the five point count locations at each forestry plot. Plot numbers follow Table 2.1**

Plot	Species	Mean number of birds	Density (Mean number ha^{-1})
1.1	Tree Pipit	0.4	1.42
1.1	Willow Warbler	1.6	5.67
1.2	Chaffinch	0.6	2.13
1.2	Coal Tit	0.2	0.71
1.2	Robin	0.4	1.42
1.3	Blue Tit	0.2	0.71
1.3	Chaffinch	0.4	1.42
1.3	Crossbill	0.4	1.42
1.3	Great Tit	0.2	0.71
1.3	Robin	0.2	0.71
1.3	Siskin	0.6	2.13
1.4	Chaffinch	0.2	0.71
1.4	Crested Tit	0.4	1.42
1.4	Goldcrest	0.2	0.71
1.4	Siskin	0.4	1.42
1.4	Treecreeper	0.4	1.42
2.1	Blue Tit	0.2	0.71
2.1	Chaffinch	0.2	0.71
2.1	Tree Pipit	0.2	0.71
2.1	Willow Warbler	1.4	4.96
2.2	Blackbird	0.2	0.71
2.2	Coal Tit	1.4	4.96
2.2	Goldcrest	0.6	2.13
2.2	Robin	0.2	0.71
2.2	Siskin	0.4	1.42
2.2	Willow Warbler	0.2	0.71

Plot	Species	Mean number of birds	Density (Mean number ha^{-1})
2.3	Robin	0.4	1.42
2.4	Chaffinch	0.4	1.42
2.4	Cuckoo	0.2	0.71
2.4	Coal Tit	0.6	2.13
2.4	Woodpigeon	0.2	0.71
2.4	Willow Warbler	1.6	5.67
3.1	Blackbird	0.4	1.42
3.1	Blue Tit	0.2	0.71
3.1	Chaffinch	1.0	3.55
3.1	Coal Tit	1.2	4.26
3.1	Goldcrest	0.8	2.84
3.1	Marsh Tit	0.2	0.71
3.1	Robin	0.6	2.13
3.1	Tree Pipit	0.2	0.71
3.1	Woodpigeon	0.2	0.71
3.1	Wren	0.2	0.71
3.1	Willow Warbler	1.0	3.55
3.2	Chaffinch	1.4	4.96
3.2	Coal Tit	0.6	2.13
3.2	Goldcrest	0.2	0.71
3.2	Treecreeper	0.2	0.71
3.2	Wren	0.4	1.42
3.3	Brambling	0.2	0.71
3.3	Chaffinch	2.4	8.51
3.3	Coal Tit	0.6	2.13
3.3	Goldcrest	0.8	2.84
3.3	Goldfinch	0.2	0.71
3.3	Wren	1.4	4.96
4.1	Blackbird	0.2	0.71

Plot	Species	Mean number of birds	Density (Mean number ha^{-1})
4.1	Blue Tit	0.6	2.13
4.1	Coal Tit	0.6	2.13
4.1	Goldcrest	0.2	0.71
4.1	Robin	0.8	2.84
4.1	Siskin	0.2	0.71
4.1	Woodpigeon	0.4	1.42
4.1	Wren	0.2	0.71
4.2	Blue Tit	0.2	0.71
4.2	Chaffinch	0.6	2.13
4.2	Coal Tit	1.2	4.26
4.2	Goldcrest	0.8	2.84
4.2	Robin	0.4	1.42
4.2	Wren	1.0	3.55
4.3	Blackbird	0.8	2.84
4.3	Chaffinch	0.2	0.71
4.3	Coal Tit	1.8	6.38
4.3	Goldcrest	0.2	0.71
4.3	Mallard	0.4	1.42
4.3	Robin	0.8	2.84
4.3	Wren	1.2	4.26
4.4	Blackcap	0.2	0.71
4.4	Blue Tit	0.4	1.42
4.4	Chaffinch	1.2	4.26
4.4	Coal Tit	1.0	3.55
4.4	Goldcrest	0.6	2.13
4.4	Greenfinch	0.2	0.71
4.4	Great Tit	0.4	1.42
4.4	Long-tailed Tit	1.2	4.26
4.4	Robin	0.6	2.13

Plot	Species	Mean number of birds	Density (Mean number ha^{-1})
4.4	Stock Dove	0.4	1.42
4.4	Wren	1.0	3.55
4.4	Willow Warbler	0.6	2.13
5.1	Chaffinch	0.6	2.13
5.1	Tree Pipit	0.2	0.71
5.1	Wren	0.4	1.42
5.1	Willow Warbler	1.2	4.26
5.2	Coal Tit	0.2	0.71
5.2	Goldcrest	0.4	1.42
5.2	Willow Warbler	0.2	0.71
5.3	Chaffinch	0.4	1.42
5.3	Coal Tit	0.4	1.42
5.3	Goldcrest	0.2	0.71
5.4	Buzzard	0.2	0.71
5.4	Chaffinch	0.6	2.13
5.4	Coal Tit	1.0	3.55
5.4	Goldcrest	0.2	0.71
5.4	Robin	0.2	0.71
5.4	Wren	0.2	0.71
5.4	Willow Warbler	0.4	1.42
6.1	Wren	0.4	1.42
6.1	Willow Warbler	1.0	3.55
6.2	Coal Tit	0.4	1.42
6.2	Goldcrest	0.4	1.42
6.2	Song Thrush	0.2	0.71
6.2	Wren	0.4	1.42
6.3	Chaffinch	0.2	0.71
6.3	Coal Tit	0.4	1.42
6.3	Goldcrest	0.2	0.71

Plot	Species	Mean number of birds	Density (Mean number ha^{-1})
6.3	Robin	0.2	0.71
6.3	Siskin	0.6	2.13
6.3	Wren	0.2	0.71
6.4	Chaffinch	0.6	2.13
6.4	Coal Tit	0.2	0.71
6.4	Goldcrest	0.4	1.42
6.4	Robin	0.2	0.71
6.4	Siskin	0.4	1.42
6.4	Treecreeper	0.4	1.42
6.4	Wren	0.4	1.42
7.1	Blackbird	0.6	2.13
7.1	Blackcap	0.2	0.71
7.1	Blue Tit	0.4	1.42
7.1	Carrion Crow	0.2	0.71
7.1	Chaffinch	1.0	3.55
7.1	Coal Tit	1.2	4.26
7.1	Goldcrest	0.6	2.13
7.1	Great Tit	0.4	1.42
7.1	Robin	0.6	2.13
7.1	Song Thrush	0.4	1.42
7.1	Treecreeper	0.4	1.42
7.1	Woodpigeon	0.2	0.71
7.1	Wren	0.2	0.71
7.2	Blue Tit	0.2	0.71
7.2	Chaffinch	0.6	2.13
7.2	Coal Tit	0.8	2.84
7.2	Goldcrest	1.6	5.67
7.2	Song Thrush	0.2	0.71
7.2	Woodpigeon	0.2	0.71

Plot	Species	Mean number of birds	Density (Mean number ha^{-1})
7.3	Blue Tit	0.6	2.13
7.3	Chiffchaff	0.2	0.71
7.3	Chaffinch	0.6	2.13
7.3	Coal Tit	0.8	2.84
7.3	Goldcrest	1.0	3.55
7.3	Magpie	0.2	0.71
7.3	Robin	0.4	1.42
7.3	Song Thrush	0.2	0.71
7.3	Wren	0.6	2.13
8.1	Blackbird	0.6	2.13
8.1	Blackcap	0.4	1.42
8.1	Bullfinch	0.2	0.71
8.1	Chiffchaff	0.4	1.42
8.1	Chaffinch	0.6	2.13
8.1	Coal Tit	2.0	7.09
8.1	Dunnock	0.4	1.42
8.1	Grasshopper Warbler	0.2	0.71
8.1	Long-tailed Tit	0.2	0.71
8.1	Robin	0.6	2.13
8.1	Siskin	1.0	3.55
8.1	Turtle Dove	0.4	1.42
8.1	Woodpigeon	1.2	4.26
8.1	Wren	1.4	4.96
8.1	Willow Warbler	2.4	8.51
8.2	Blackbird	0.2	0.71
8.2	Brambling	0.2	0.71
8.2	Chaffinch	0.6	2.13
8.2	Coal Tit	0.4	1.42
8.2	Goldcrest	1.0	3.55

Plot	Species	Mean number of birds	Density (Mean number ha^{-1})
8.2	Robin	0.4	1.42
8.2	Song Thrush	0.2	0.71
8.2	Woodpigeon	1.6	5.67
8.2	Wren	0.4	1.42
8.3	Blackbird	0.2	0.71
8.3	Blue Tit	0.2	0.71
8.3	Chaffinch	1.4	4.96
8.3	Coal Tit	1.0	3.55
8.3	Goldcrest	1.0	3.55
8.3	Woodpigeon	1.0	3.55
9.1	Tree Pipit	0.4	1.42
9.1	Willow Warbler	1.0	3.55
9.2	Chaffinch	0.8	2.84
9.2	Coal Tit	0.4	1.42
9.2	Goldcrest	0.4	1.42
9.2	Redpoll	2.0	7.09
9.2	Siskin	1.8	6.38
9.3	Blue Tit	0.2	0.71
9.3	Chaffinch	0.2	0.71
9.3	Coal Tit	0.6	2.13
9.3	Redpoll	0.8	2.84
9.3	Siskin	1.2	4.26
9.3	Wren	0.4	1.42
9.3	Willow Warbler	0.2	0.71
10.1	Chaffinch	0.4	1.42
10.1	Coal Tit	0.2	0.71
10.1	Robin	0.4	1.42
10.1	Song Thrush	0.2	0.71
10.1	Tree Pipit	0.2	0.71

Plot	Species	Mean number of birds	Density (Mean number ha^{-1})
10.1	Willow Warbler	1.6	5.67
10.2	Blackbird	0.2	0.71
10.2	Chaffinch	0.4	1.42
10.2	Coal Tit	0.4	1.42
10.2	Goldcrest	0.2	0.71
10.2	Robin	0.2	0.71
10.2	Siskin	1.2	4.26
10.2	Woodpigeon	0.8	2.84
10.2	Wren	0.4	1.42
10.3	Chaffinch	1.0	3.55
10.3	Coal Tit	1.0	3.55
10.3	Goldcrest	0.2	0.71
10.3	Robin	0.4	1.42
10.3	Siskin	1.0	3.55
10.3	Willow Warbler	0.2	0.71
10.4	Crossbill	2.6	9.22
10.4	Coal Tit	0.6	2.13
10.4	Goldcrest	0.4	1.42
10.4	Great-spotted Woodpecker	0.2	0.71
10.4	Siskin	1.0	3.55
10.4	Wren	0.4	1.42
11.1	Blackbird	0.2	0.71
11.1	Blackcap	0.4	1.42
11.1	Chiffchaff	0.4	1.42
11.1	Chaffinch	0.4	1.42
11.1	Dunnock	0.2	0.71
11.1	Long-tailed Tit	1.2	4.26
11.1	Robin	1.0	3.55
11.1	Wren	0.2	0.71

Plot	Species	Mean number of birds	Density (Mean number ha^{-1})
11.1	Willow Warbler	3.2	11.35
11.1	Yellowhammer	0.6	2.13
11.2	Blue Tit	0.2	0.71
11.2	Chaffinch	1.0	3.55
11.2	Coal Tit	1.0	3.55
11.2	Goldcrest	1.4	4.96
11.2	Woodpigeon	0.2	0.71
11.2	Wren	0.2	0.71
11.3	Chaffinch	1.6	5.67
11.3	Coal Tit	0.2	0.71
11.3	Goldcrest	0.4	1.42
11.3	Wren	0.2	0.71
11.4	Blackbird	0.2	0.71
11.4	Chaffinch	0.4	1.42
11.4	Coal Tit	0.4	1.42
11.4	Robin	0.2	0.71
11.4	Wren	0.2	0.71
12.1	Chaffinch	0.2	0.71
12.1	Coal Tit	0.2	0.71
12.1	Linnet	0.4	1.42
12.1	Robin	0.6	2.13
12.1	Tree Pipit	0.4	1.42
12.1	Willow Warbler	3.0	10.64
12.1	Yellowhammer	1.4	4.96
12.2	Chiffchaff	0.2	0.71
12.2	Chaffinch	1.0	3.55
12.2	Coal Tit	0.2	0.71
12.2	Robin	0.4	1.42
12.2	Woodpigeon	0.2	0.71

Plot	Species	Mean number of birds	Density (Mean number ha^{-1})
12.2	Wren	0.8	2.84
12.3	Chaffinch	0.2	0.71
12.3	Coal Tit	0.2	0.71
12.3	Robin	0.2	0.71
12.3	Woodpigeon	0.2	0.71
12.3	Wren	0.6	2.13

Appendix 2 **The estimated number of territories and density of territories of each species of bird recorded within the core and whole plot at each BRP plot based on mapping. Plot numbers follow 2.1.**

Site	Species	Number of Territories		Density (per ha)
		Whole Plot	Core (also Density)	
1.1	Goldcrest	1	1	0.39063
1.1	Tree Pipit	2	0	0.78125
1.1	Willow Warbler	8	3	3.12500
1.2	Chaffinch	2	0	0.78125
1.2	Coal Tit	2	0	0.78125
1.2	Robin	1	1	0.39063
1.2	Siskin	2	1	0.78125
1.2	Wren	2	2	0.78125
1.3	Blackbird	1	0	0.39063
1.3	Chaffinch	3	1	1.17188
1.3	Crossbill	2	2	0.78125
1.3	Coal Tit	3	2	1.17188
1.3	Goldcrest	1	1	0.39063
1.3	Robin	2	0	0.78125
1.3	Siskin	1	1	0.39063
1.3	Treecreeper	2	2	0.78125
1.4	Chaffinch	5	1	1.95313
1.4	Coal Tit	3	2	1.17188
1.4	Goldcrest	1	0	0.39063
1.4	Siskin	1	1	0.39063
1.4	Song Thrush	1	1	0.39063
1.4	Treecreeper	2	0	0.78125
1.4	Tree Pipit	2	1	0.78125
1.4	Wren	2	1	0.78125
2.1	Blue Tit	2	1	0.78125
2.1	Chaffinch	1	0	0.39063

Site	Species	Number of Territories		Density (per ha)
		Whole Plot	Core (also Density)	
2.1	Tree Pipit	1	1	0.39063
2.1	Wren	1	0	0.39063
2.1	Willow Warbler	9	5	3.51563
2.2	Coal Tit	7	1	2.73438
2.2	Goldcrest	2	0	0.78125
2.2	Robin	2	1	0.78125
2.2	Siskin	2	0	0.78125
2.2	Wren	1	0	0.39063
2.3	Chaffinch	1	0	0.39063
2.3	Coal Tit	3	2	1.17188
2.3	Robin	2	0	0.78125
2.3	Siskin	3	0	1.17188
2.3	Treecreeper	1	0	0.39063
2.3	Wren	1	0	0.39063
2.4	Coal Tit	3	1	1.17188
2.4	Siskin	2	0	0.78125
2.4	Woodpigeon	1	0	0.39063
2.4	Wren	1	0	0.39063
2.4	Willow Warbler	5	3	1.95313
3.1	Blackbird	1	0	0.39063
3.1	Blue Tit	2	2	0.78125
3.1	Chaffinch	1	1	0.39063
3.1	Coal Tit	8	1	3.12500
3.1	Goldcrest	3	1	1.17188
3.1	Marsh Tit	1	1	0.39063
3.1	Robin	4	3	1.56250
3.1	Siskin	2	2	0.78125
3.1	Woodpigeon	1	0	0.39063

Site	Species	Number of Territories		Density (per ha)
		Whole Plot	Core (also Density)	
3.1	Wren	1	0	0.39063
3.1	Willow Warbler	2	0	0.78125
3.2	Chaffinch	5	3	1.95313
3.2	Coal Tit	4	1	1.56250
3.2	Goldcrest	1	0	0.39063
3.2	Treecreeper	1	1	0.39063
3.2	Wren	1	0	0.39063
3.3	Blackcap	2	2	0.78125
3.3	Chaffinch	1	6	4.68750
3.3	Coal Tit	2	1	0.78125
3.3	Goldcrest	5	1	1.95313
3.3	Goldfinch	1	0	0.39063
3.3	Great-spotted Woodpecker	1	0	0.39063
3.3	Siskin	1	0	0.39063
3.3	Wren	3	2	1.17188
4.1	Blackbird	1	0	0.39063
4.1	Blue Tit	2	0	0.78125
4.1	Cuckoo	1	0	0.39063
4.1	Coal Tit	5	1	1.95313
4.1	Goldcrest	3	2	1.17188
4.1	Great Tit	1	0	0.39063
4.1	Robin	5	1	1.95313
4.1	Siskin	1	0	0.39063
4.1	Woodpigeon	4	1	1.56250
4.1	Wren	1	1	0.39063
4.2	Blue Tit	1	1	0.39063
4.2	Buzzard	1	0	0.39063
4.2	Chaffinch	4	0	1.56250

Site	Species	Number of Territories		Density (per ha)
		Whole Plot	Core (also Density)	
4.2	Coal Tit	6	2	2.34375
4.2	Goldcrest	4	0	1.56250
4.2	Great-spotted Woodpecker	1	1	0.39063
4.2	Robin	3	0	1.17188
4.2	Woodpigeon	2	1	0.78125
4.2	Wren	4	0	1.56250
4.3	Blue Tit	2	1	0.78125
4.3	Chaffinch	6	3	2.34375
4.3	Coal Tit	8	3	3.12500
4.3	Green Woodpecker	1	0	0.39063
4.3	Goldcrest	2	2	0.78125
4.3	Mallard	2	0	0.78125
4.3	Robin	3	1	1.17188
4.3	Woodpigeon	1	1	0.39063
4.3	Wren	6	3	2.34375
4.4	Blackbird	1	1	0.39063
4.4	Blue Tit	2	2	0.78125
4.4	Chaffinch	8	6	3.12500
4.4	Coal Tit	4	3	1.56250
4.4	Goldcrest	2	1	0.78125
4.4	Great-spotted Woodpecker	1	1	0.39063
4.4	Great Tit	1	0	0.39063
4.4	Long-tailed Tit	4	2	1.56250
4.4	Robin	1	1	0.39063
4.4	Treecreeper	2	1	0.78125
4.4	Tree Pipit	1	0	0.39063
4.4	Woodpigeon	1	0	0.39063
4.4	Wren	3	1	1.17188

Site	Species	Number of Territories		Density (per ha)
		Whole Plot	Core (also Density)	
4.4	Willow Warbler	3	1	1.17188
5.1	Chaffinch	2	0	0.78125
5.1	Coal Tit	2	2	0.78125
5.1	Mistle Thrush	1	0	0.39063
5.1	Wren	2	1	0.78125
5.1	Willow Warbler	4	3	1.56250
5.2	Chiffchaff	1	1	0.39063
5.2	Coal Tit	2	1	0.78125
5.2	Goldcrest	5	1	1.95313
5.2	Willow Warbler	1	0	0.39063
5.3	Chaffinch	3	1	1.17188
5.3	Coal Tit	3	0	1.17188
5.3	Goldcrest	2	0	0.78125
5.3	Robin	1	0	0.39063
5.3	Siskin	1	1	0.39063
5.4	Buzzard	2	1	0.78125
5.4	Chaffinch	4	3	1.56250
5.4	Coal Tit	4	2	1.56250
5.4	Goldcrest	1	0	0.39063
5.4	Robin	4	1	1.56250
5.4	Siskin	1	1	0.39063
5.4	Wren	4	2	1.56250
6.1	Siskin	2	2	0.78125
6.1	Wren	2	1	0.78125
6.1	Willow Warbler	5	3	1.95313
6.2	Chaffinch	2	1	0.78125
6.2	Coal Tit	4	1	1.56250
6.2	Goldcrest	1	1	0.39063

Site	Species	Number of Territories		Density (per ha)
		Whole Plot	Core (also Density)	
6.2	Siskin	1	0	0.39063
6.2	Song Thrush	1	0	0.39063
6.2	Wren	1	0	0.39063
6.3	Chaffinch	2	2	0.78125
6.3	Crossbill	2	2	0.78125
6.3	Coal Tit	4	2	1.56250
6.3	Goldcrest	3	1	1.17188
6.3	Robin	1	0	0.39063
6.3	Siskin	3	3	1.17188
6.3	Wren	1	0	0.39063
6.4	Blackbird	1	0	0.39063
6.4	Chaffinch	3	3	1.17188
6.4	Coal Tit	3	2	1.17188
6.4	Goldcrest	1	0	0.39063
6.4	Robin	1	1	0.39063
6.4	Siskin	1	1	0.39063
6.4	Treecreeper	1	0	0.39063
6.4	Wren	4	1	1.56250
7.1	Blackbird	2	2	0.78125
7.1	Blackcap	1	1	0.39063
7.1	Blue Tit	1	1	0.39063
7.1	Chaffinch	5	2	1.95313
7.1	Coal Tit	4	3	1.56250
7.1	Green Woodpecker	1	1	0.39063
7.1	Goldcrest	3	2	1.17188
7.1	Great Tit	2	1	0.78125
7.1	Robin	6	1	2.34375
7.1	Song Thrush	2	1	0.78125

Site	Species	Number of Territories		Density (per ha)
		Whole Plot	Core (also Density)	
7.1	Treecreeper	2	1	0.78125
7.1	Woodpigeon	2	2	0.78125
7.1	Wren	2	1	0.78125
7.1	Willow Warbler	1	1	0.39063
7.2	Blackbird	2	0	0.78125
7.2	Blue Tit	2	0	0.78125
7.2	Chaffinch	3	0	1.17188
7.2	Coal Tit	3	2	1.17188
7.2	Goldcrest	6	3	2.34375
7.2	Song Thrush	1	1	0.39063
7.2	Woodpigeon	4	3	1.56250
7.2	Wren	2	2	0.78125
7.3	Blackbird	3	1	1.17188
7.3	Blackcap	2	0	0.78125
7.3	Blue Tit	2	1	0.78125
7.3	Chiffchaff	1	0	0.39063
7.3	Chaffinch	5	3	1.95313
7.3	Coal Tit	4	2	1.56250
7.3	Goldcrest	3	1	1.17188
7.3	Robin	2	2	0.78125
7.3	Woodpigeon	2	2	0.78125
7.3	Wren	2	1	0.78125
8.1	Blackbird	4	2	1.56250
8.1	Blackcap	1	0	0.39063
8.1	Bullfinch	1	0	0.39063
8.1	Chiffchaff	2	1	0.78125
8.1	Chaffinch	5	3	1.95313
8.1	Coal Tit	2	1	0.78125

Site	Species	Number of Territories		Density (per ha)
		Whole Plot	Core (also Density)	
8.1	Dunnock	2	1	0.78125
8.1	Greenfinch	1	1	0.39063
8.1	Robin	4	2	1.56250
8.1	Turtle Dove	2	1	0.78125
8.1	Woodpigeon	2	2	0.78125
8.1	Wren	4	2	1.56250
8.1	Willow Warbler	9	6	3.51563
8.2	Brambling	1	1	0.39063
8.2	Chaffinch	4	1	1.56250
8.2	Coal Tit	3	1	1.17188
8.2	Goldcrest	5	2	1.95313
8.2	Great Tit	1	1	0.39063
8.2	Redpoll	1	1	0.39063
8.2	Nuthatch	1	0	0.39063
8.2	Robin	3	1	1.17188
8.2	Song Thrush	1	0	0.39063
8.2	Treecreeper	1	0	0.39063
8.2	Woodpigeon	11	7	4.29688
8.2	Wren	4	1	1.56250
8.3	Blackbird	1	0	0.39063
8.3	Blue Tit	1	1	0.39063
8.3	Chaffinch	5	3	1.95313
8.3	Coal Tit	3	1	1.17188
8.3	Goldcrest	4	2	1.56250
8.3	Woodpigeon	7	5	2.73438
9.1	Siskin	1	1	0.39063
9.1	Tree Pipit	1	1	0.39063
9.1	Wren	1	1	0.39063

Site	Species	Number of Territories		Density (per ha)
		Whole Plot	Core (also Density)	
9.1	Willow Warbler	8	1	3.12500
9.2	Chaffinch	3	1	1.17188
9.2	Coal Tit	2	2	0.78125
9.2	Goldcrest	1	1	0.39063
9.2	Redpoll	7	2	2.73438
9.2	Robin	1	1	0.39063
9.2	Siskin	4	2	1.56250
9.3	Chaffinch	1	1	0.39063
9.3	Coal Tit	2	1	0.78125
9.3	Redpoll	1	0	0.39063
9.3	Siskin	3	1	1.17188
10.1	Chaffinch	2	0	0.78125
10.1	Coal Tit	1	0	0.39063
10.1	Robin	1	0	0.39063
10.1	Willow Warbler	8	4	3.12500
10.2	Blackbird	1	0	0.39063
10.2	Chaffinch	3	2	1.17188
10.2	Coal Tit	1	0	0.39063
10.2	Goldcrest	1	0	0.39063
10.2	Robin	1	0	0.39063
10.2	Siskin	6	0	2.34375
10.2	Woodpigeon	6	2	2.34375
10.2	Wren	1	0	0.39063
10.2	Willow Warbler	1	0	0.39063
10.3	Chaffinch	3	1	1.17188
10.3	Coal Tit	3	1	1.17188
10.3	Goldcrest	1	1	0.39063
10.3	Robin	2	1	0.78125

Site	Species	Number of Territories		Density (per ha)
		Whole Plot	Core (also Density)	
10.3	Siskin	3	2	1.17188
10.3	Willow Warbler	1	1	0.39063
10.4	Chaffinch	4	1	1.56250
10.4	Crossbill	2	0	0.78125
10.4	Coal Tit	2	1	0.78125
10.4	Goldcrest	2	1	0.78125
10.4	Mistle Thrush	1	1	0.39063
10.4	Robin	2	1	0.78125
10.4	Siskin	3	1	1.17188
10.4	Wren	1	1	0.39063
11.1	Blackcap	1	0	0.39063
11.1	Chiffchaff	2	1	0.78125
11.1	Chaffinch	2	1	0.78125
11.1	Dunnock	1	1	0.39063
11.1	Garden Warbler	1	1	0.39063
11.1	Linnet	3	2	1.17188
11.1	Long-tailed Tit	1	1	0.39063
11.1	Robin	4	1	1.56250
11.1	Wren	1	1	0.39063
11.1	Willow Warbler	11	6	4.29688
11.1	Yellowhammer	4	1	1.56250
11.2	Blue Tit	1	1	0.39063
11.2	Chaffinch	2	1	0.78125
11.2	Coal Tit	3	2	1.17188
11.2	Goldcrest	3	1	1.17188
11.3	Chaffinch	4	1	1.56250
11.3	Coal Tit	1	1	0.39063
11.3	Goldcrest	1	1	0.39063

Site	Species	Number of Territories		Density (per ha)
		Whole Plot	Core (also Density)	
11.3	Woodpigeon	1	0	0.39063
11.3	Wren	2	0	0.78125
11.4	Blackbird	1	0	0.39063
11.4	Chaffinch	3	1	1.17188
11.4	Coal Tit	4	2	1.56250
11.4	Robin	1	0	0.39063
11.4	Siskin	1	0	0.39063
11.4	Woodpigeon	1	0	0.39063
11.4	Wren	2	1	0.78125
12.1	Chaffinch	1	0	0.39063
12.1	Coal Tit	1	0	0.39063
12.1	Long-tailed Tit	1	1	0.39063
12.1	Tree Pipit	3	2	1.17188
12.1	Willow Warbler	10	3	3.90625
12.1	Yellowhammer	3	1	1.17188
12.2	Chaffinch	2	1	0.78125
12.2	Coal Tit	1	1	0.39063
12.2	Goldcrest	1	0	0.39063
12.2	Robin	1	0	0.39063
12.2	Woodpigeon	2	0	0.78125
12.2	Wren	3	0	1.17188
12.3	Chaffinch	2	0	0.78125
12.3	Goldcrest	1	0	0.39063
12.3	Robin	2	0	0.78125
12.3	Woodpigeon	1	1	0.39063
12.3	Wren	2	1	0.78125

Appendix 3: The two-letter codes and scientific names for bird species mentioned in this report.

Blackbird	**B.**	***Turdus merula***
Blackcap	**BC**	***Sylvia atricapilla***
Blue Tit	**BT**	***Parus caeruleus***
Brambling	**BL**	***Fringilla montifringilla***
Bullfinch	**BF**	***Pyrrhula pyrrhula***
Buzzard	**BZ**	***Buteo buteo***
Carion Crow	**C.**	***Corvus corone***
Chaffinch	**CH**	***Fringilla coelebs***
Chiffchaff	**CC**	***Phylloscopus collybita***
Coal Tit	**CT**	***Parus ater***
Crested Tit	**CI**	***Parus cristatus***
Crossbill	**CR**	***Loxia curvirostra***
Cuckoo	**CK**	***Cuculus canorus***
Dunnock	**D.**	***Prunella modularis***
Garden Warbler	**GW**	***Sylvia borin***
Goldcrest	**GC**	***Regulus regulus***
Goldfinch	**GO**	***Carduelis carduelis***
Goshawk	**GI**	***Accipiter gentilis***
Grasshopper Warbler	**GH**	***Locustella naevia***
Great Tit	**GT**	***Parus major***
Great-spotted Woodpecker	**GS**	***Dendrocopos major***
Green Woodpecker	**G.**	***Picus viridis***
Greenfinch	**GR**	***Chloris chloris***
Linnet	**LI**	***Carduelis cannabina***
Long-tailed Tit	**LT**	***Aegithalos caudatus***
Magpie	**MG**	***Pica pica***
Mallard	**MA**	***Anas platyrhynchos***
Marsh Tit	**MT**	***Parus palustris***
Meadow Pipit	**MP**	***Anthus pratensis***
Nuthatch	**NA**	***Sitta europaea***
Nighjar	**NJ**	***Caprimulgus europaeus***
Redpoll	**LR**	***Carduelis flammea***
Robin	**R.**	***Erithacus rubecula***
Siskin	**SK**	***Carduelis spinus***
Skylark	**S.**	***Alauda arvensis***
Song Thrush	**ST**	***Turdus philomelos***
Tree Pipit	**TP**	***Anthus trivialis***
Treecreeper	**TC**	***Certhia familiaris***
Turtle Dove	**TD**	***Streptopelia turtur***
Whinchat	**WC**	***Saxicola rubetra***
Willow Warbler	**WW**	***Phylloscopus trochilus***
Woodlark	**WL**	***Lullula arborea***
Woodpigeon	**WP**	***Columba palumbus***
Wren	**WR**	***Troglodytes troglodytes***
Yellowhammer	**Y.**	***Emberiza citrinella***