



BTO Research Report No. 356

**Comparison of London wild bird
population trends with those
in the surrounding area: update
1994-2002**

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March 2004

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1. INTRODUCTION

In response to a previous request from Dr D.G. Dawson of the Greater London Authority, data from the BTO/JNCC/RSPB Breeding Bird Survey (BBS) for 1994-2000 were analysed in order to statistically compare bird population trends in Greater London with those in the surrounding area defined as the Southeast and East of England Government Office regions combined (Newson & Noble 2003). The results, in a series of tables and figures, present population trends with confidence intervals as well as a test of the significance of differences in the linear trend between London and the surrounding area for the period 1994 to 2000. These results were provided to the Greater London Authority for inclusion in their state of the Environment Report. This report updates these analyses to compare bird trends in Greater London with those in the surrounding area for the period 1994 to 2002.

2. ANALYTICAL METHODS

We examine trends in 21 wild bird species reliably monitored in Greater London and the surrounding area (the Southeast and East of England Government Office Regions) over the period 1994 to 2002. Foot-and-mouth had no apparent influence on survey coverage within London in 2001, whilst Southeast and East of England was severely affected, reducing and biasing coverage in this year. In these analyses, we include data for 2001 for Southeast and East of England (combined), and make the assumption that data from a single year in a run of nine will have relatively little influence on the underlying linear trend. However, caution should be made when examining the annual indices for 2001, particularly for 'outside London' because that index is almost certainly biased towards trends on non-farmland sites. However, inclusion of 2001 data in the annual model should have very little effect on the estimates for any other year. The only possible influence on estimates for other years would come from the inclusion of sites covered in 2001 and in only one other year – for example sites started in 2001 and continued in 2002. The number of these in this region is tiny (<10) and even if trends were radically different on these sites, they should have little impact on the estimates.

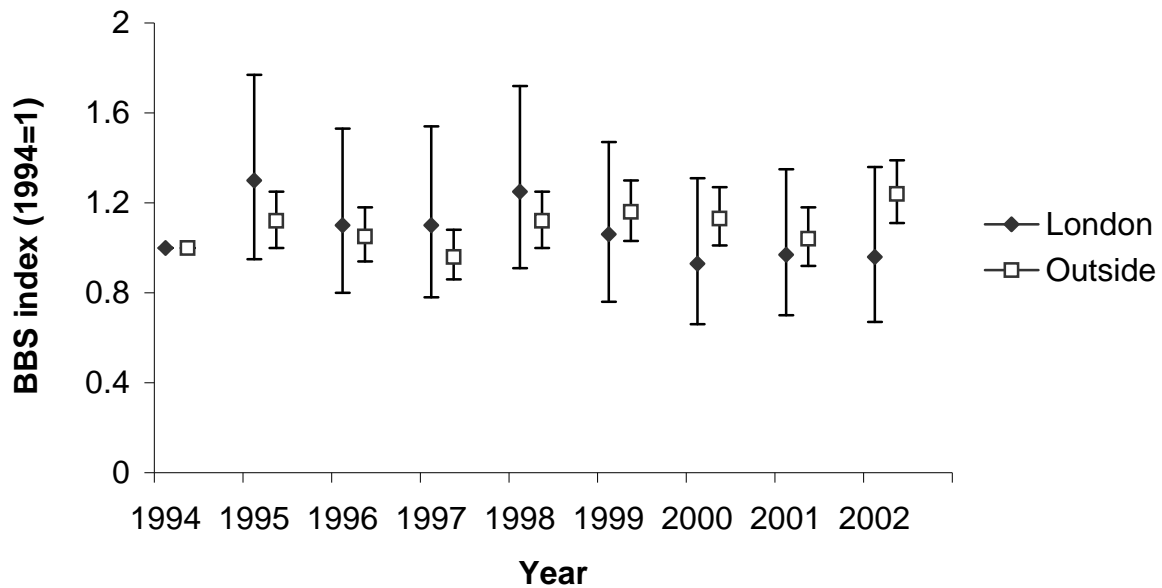
In all cases, data were analysed using log-linear Poisson regression models fitted in SAS (SAS 1996). Annual indices were first produced by modeling a matrix of annual site counts, with site and year effects (ter Braak *et al.* 1994). The year effect is an annual index of total numbers, whilst the site effect describes how species abundance at sites differ from one another. The last index of a run of years is set to an arbitrary value 1 and other indices are measured relative to this.

The second analyses examines the significance of the underlying trend by removing the year effect from the model and formally testing whether the trend is significantly different from zero. We then establish whether linear trends within London and Southeast and East of England combined are significantly different from another. In these analyses, an additional variable 'region' was employed where 'region' = 1 for a site in the London Government Office Region and 0 in the Southeast or East of England Government Office Regions. Adding to the model a year*region interaction enables a formal assessment of the significance of the difference in linear trends, between two geographic areas for the time period 1994 to 2002.

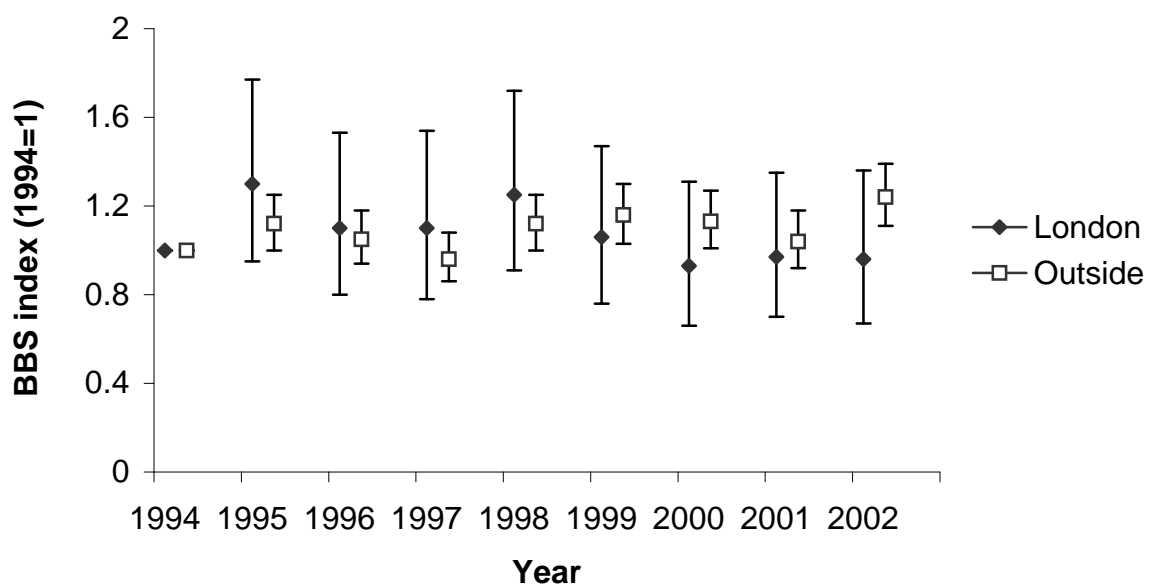
3. RESULTS

Figure 1 Comparison between annual BBS indices within London Government Office Region for the period 1994-2002 and Southeast and East of England combined (Southeast and East of England Government Office Regions) for the years 1994-2002 for 21 common bird species. The error bars represent 95% confidence intervals of the BBS indices. Indices are measured relative to the year 1994, which is set to 1. Indices are staggered for visual purposes. The raw data is additionally presented in Tables 1 and 2.

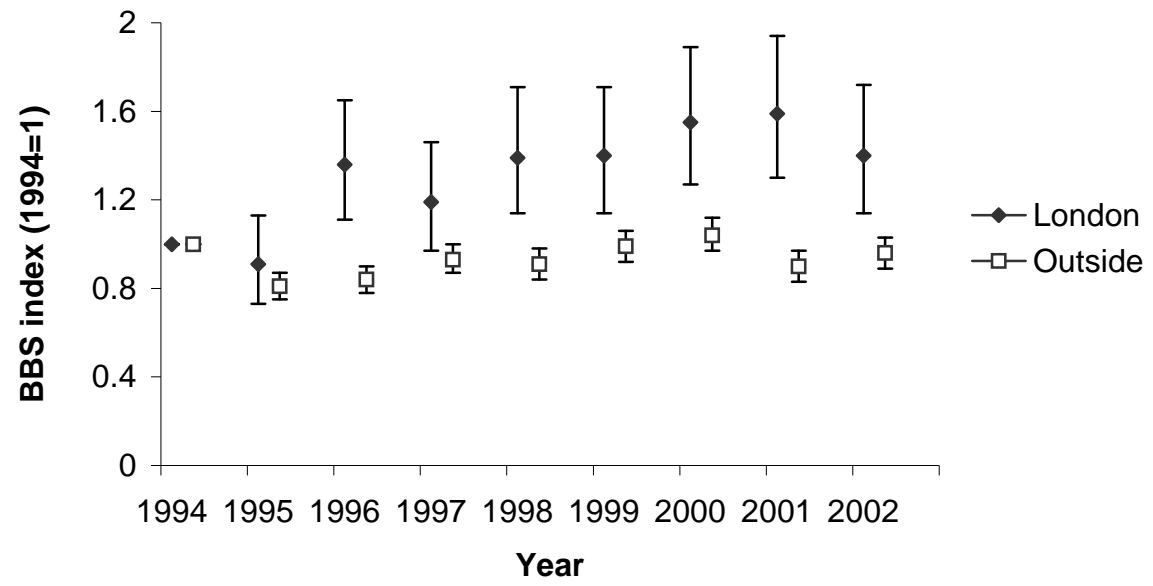
a) Mallard



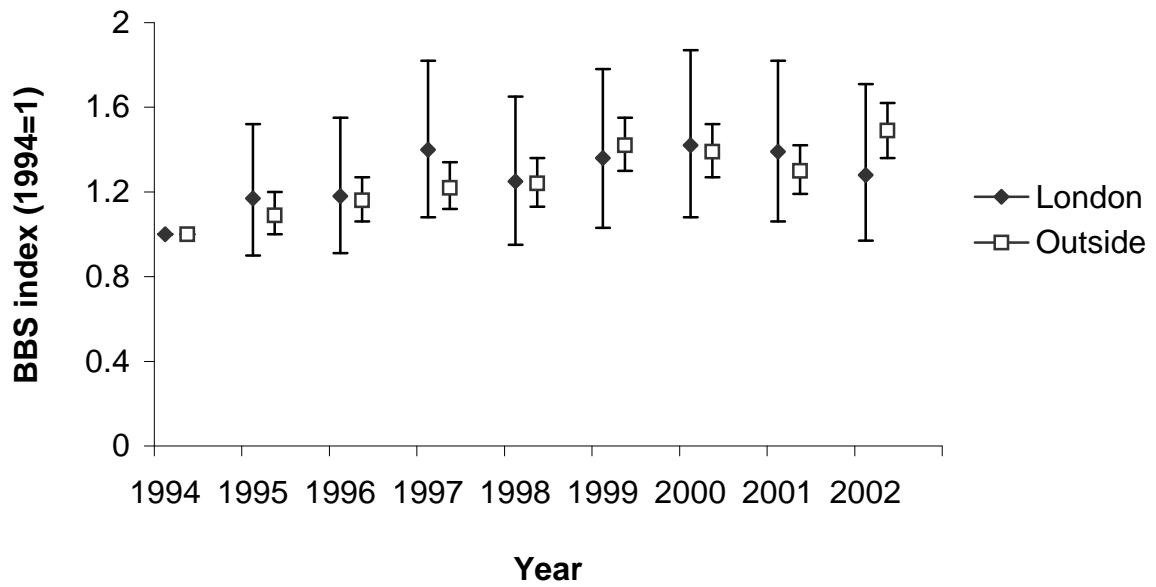
b) Feral Pigeon



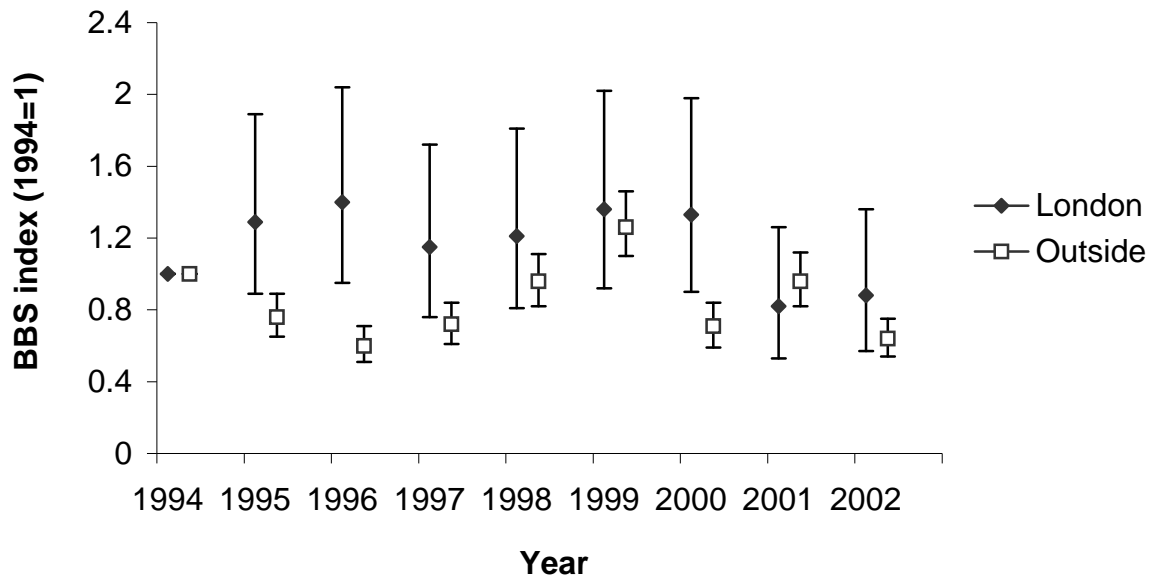
c) Wood Pigeon



d) Collared Dove



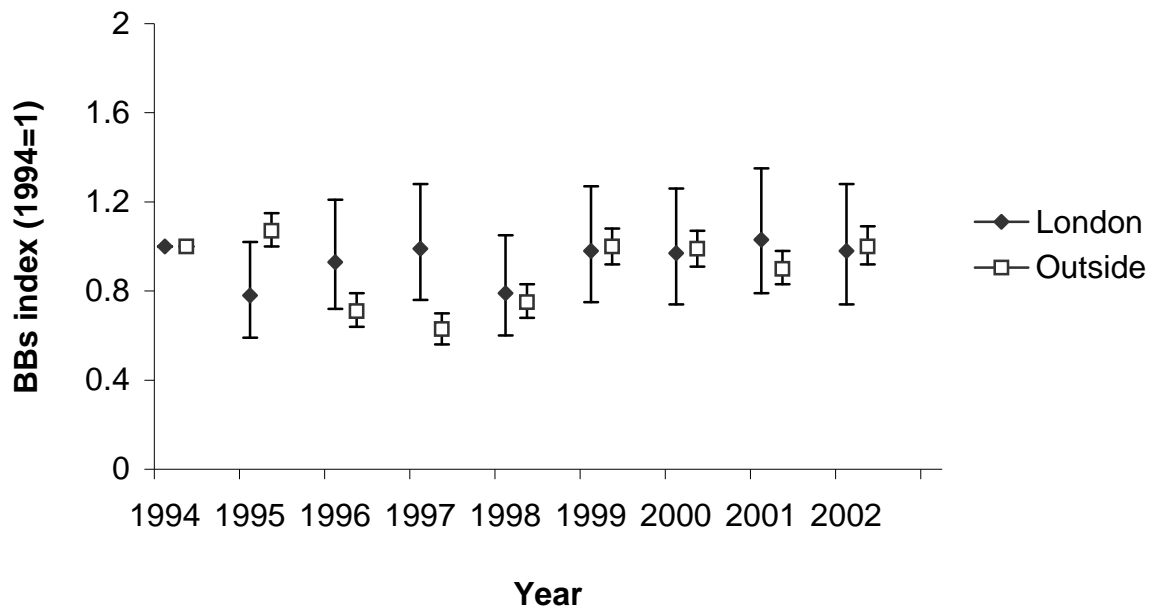
e) Swift



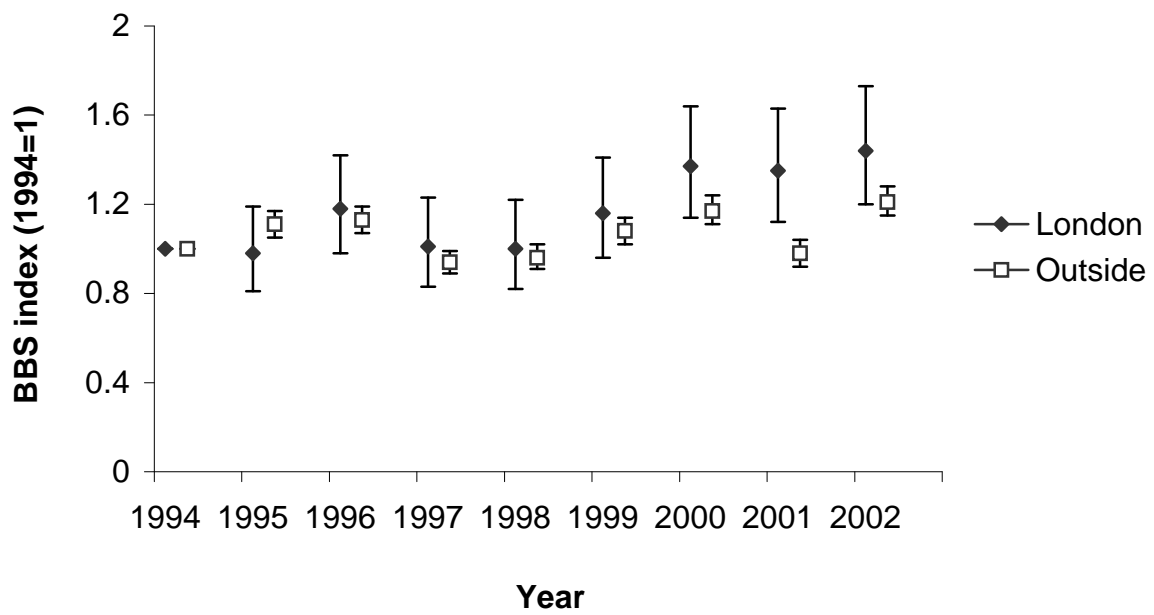
f) Wren



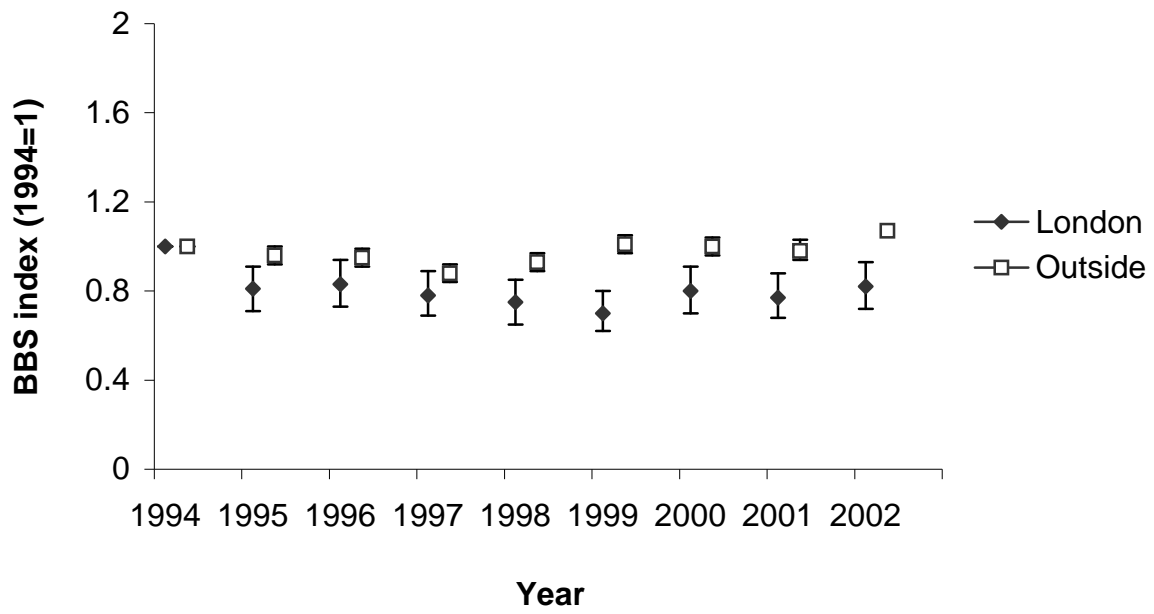
g) Dunnock



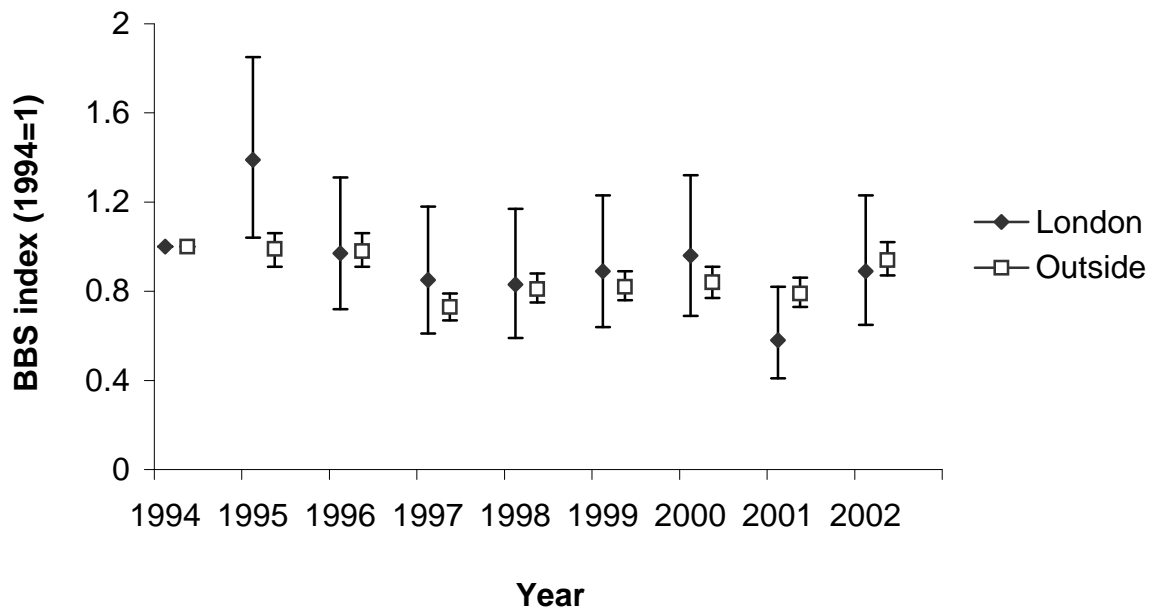
h) Robin



i) Blackbird



j) Song Thrush



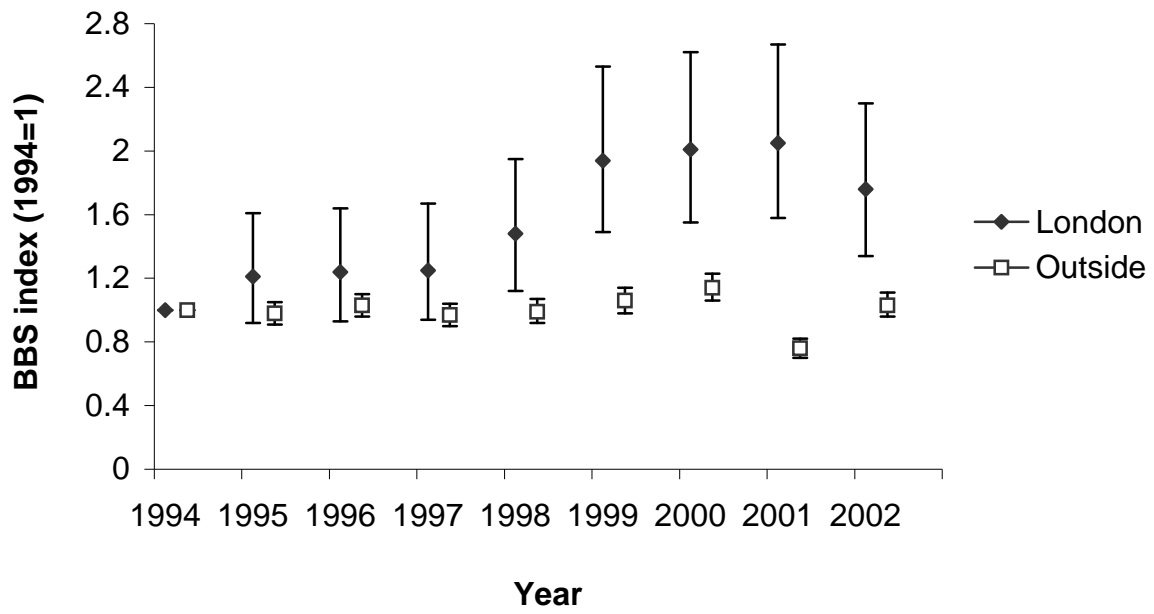
k) Mistle Thrush



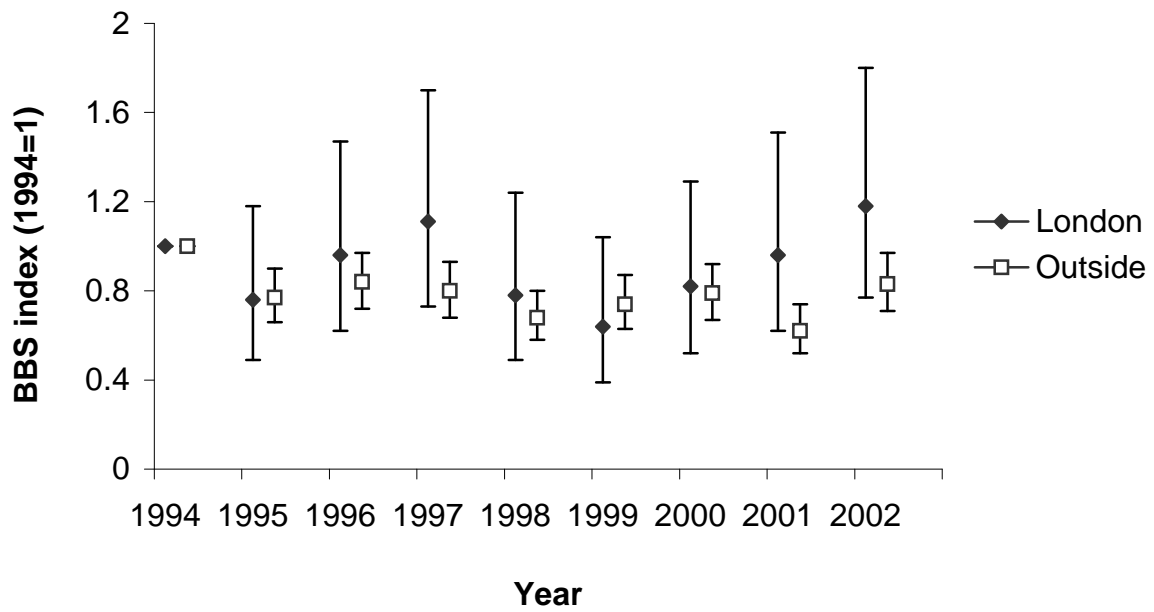
l) Blue Tit



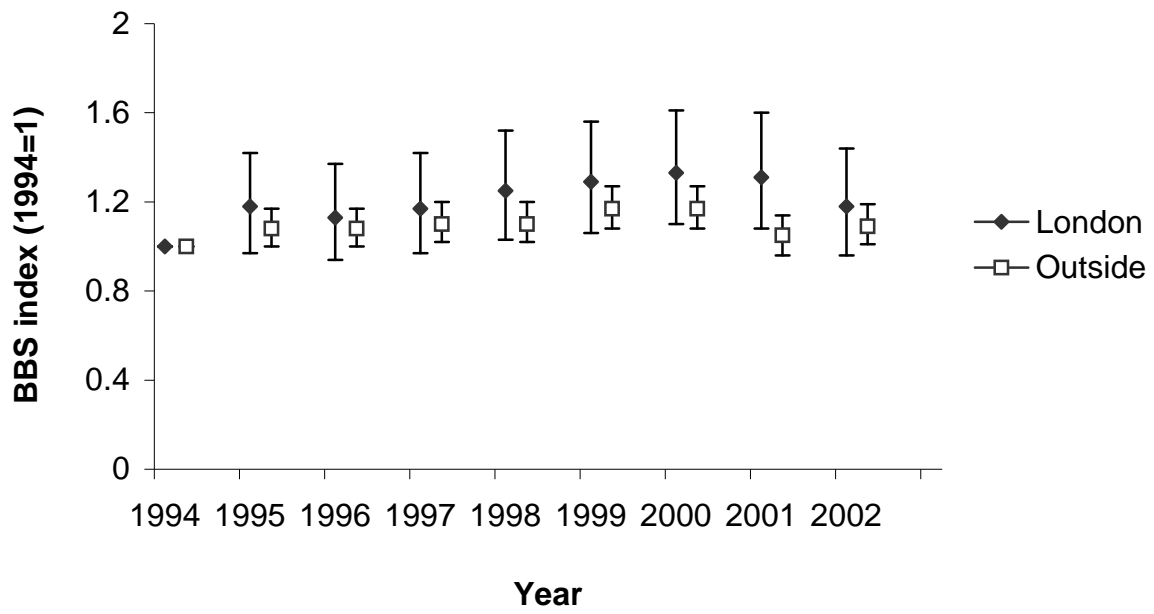
m) Great Tit



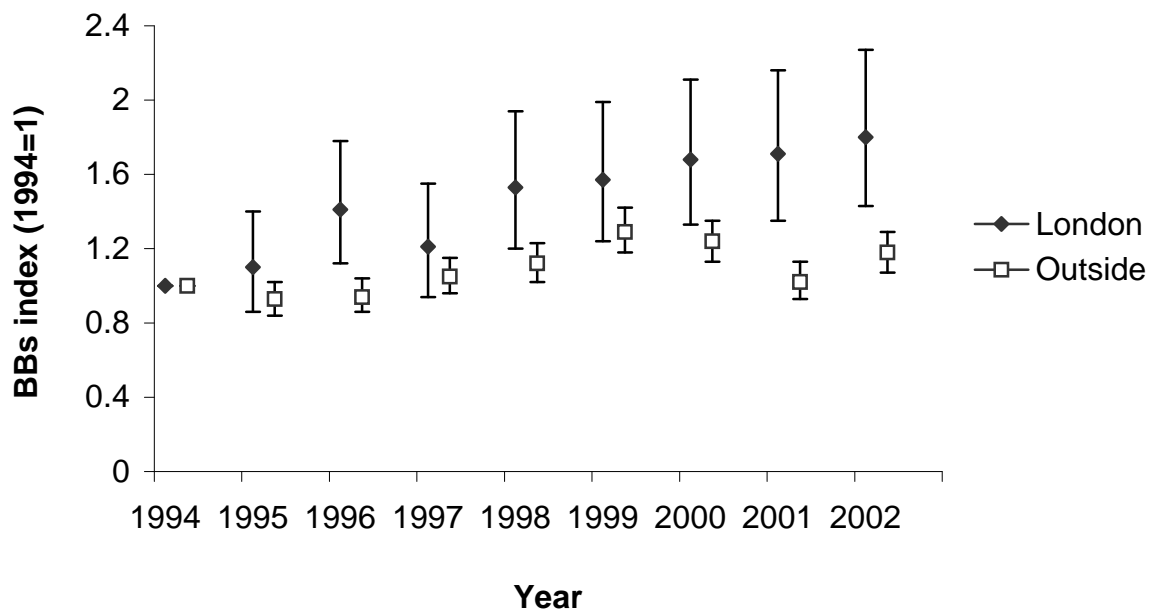
n) Jay



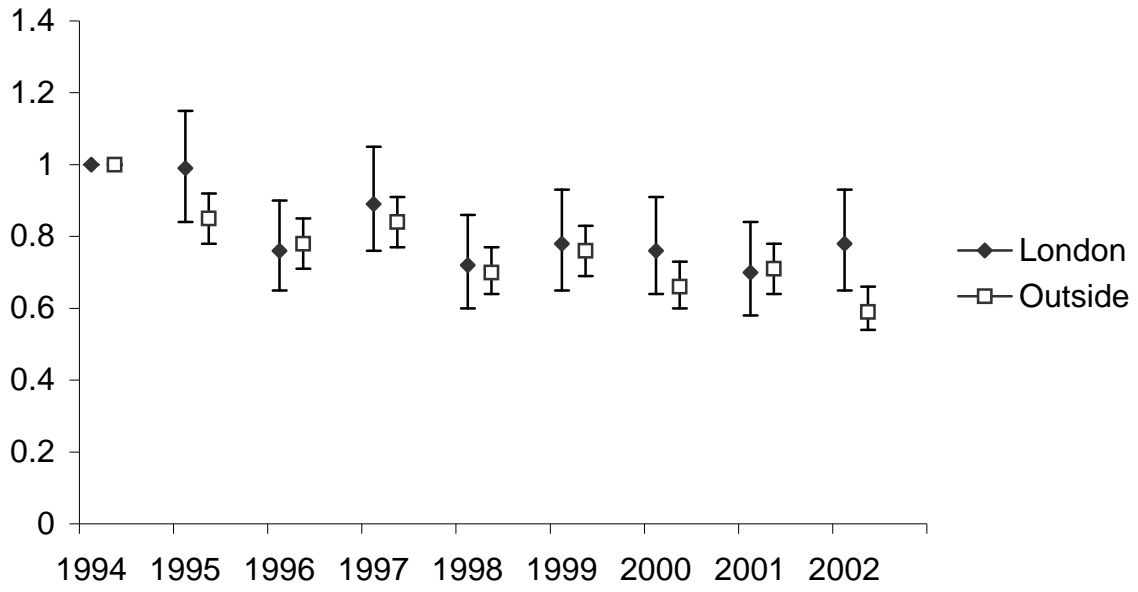
o) Magpie



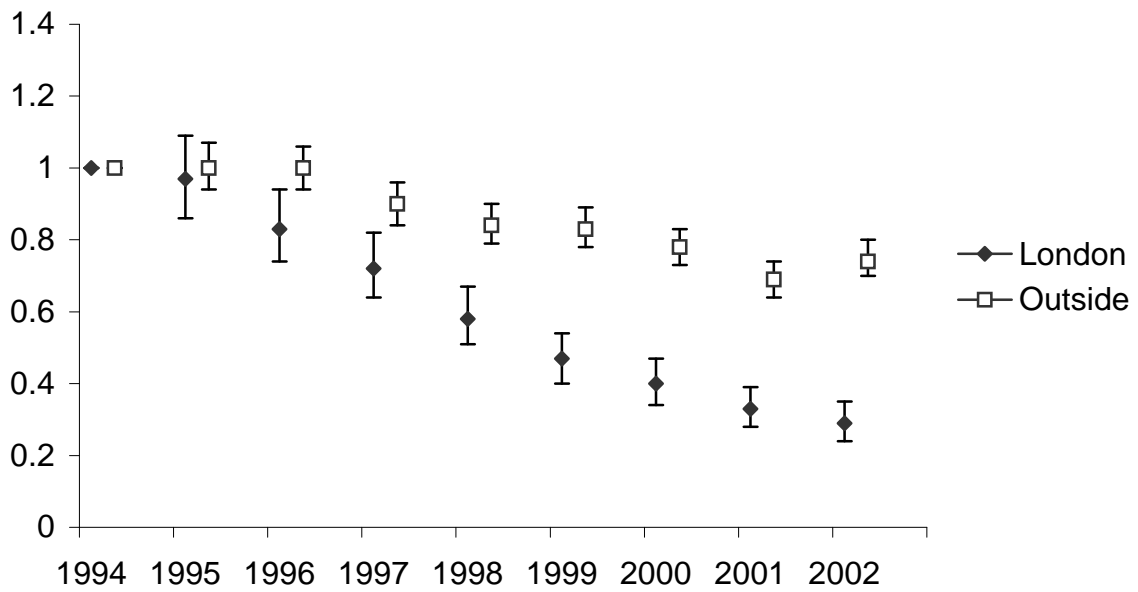
p) Carrion Crow



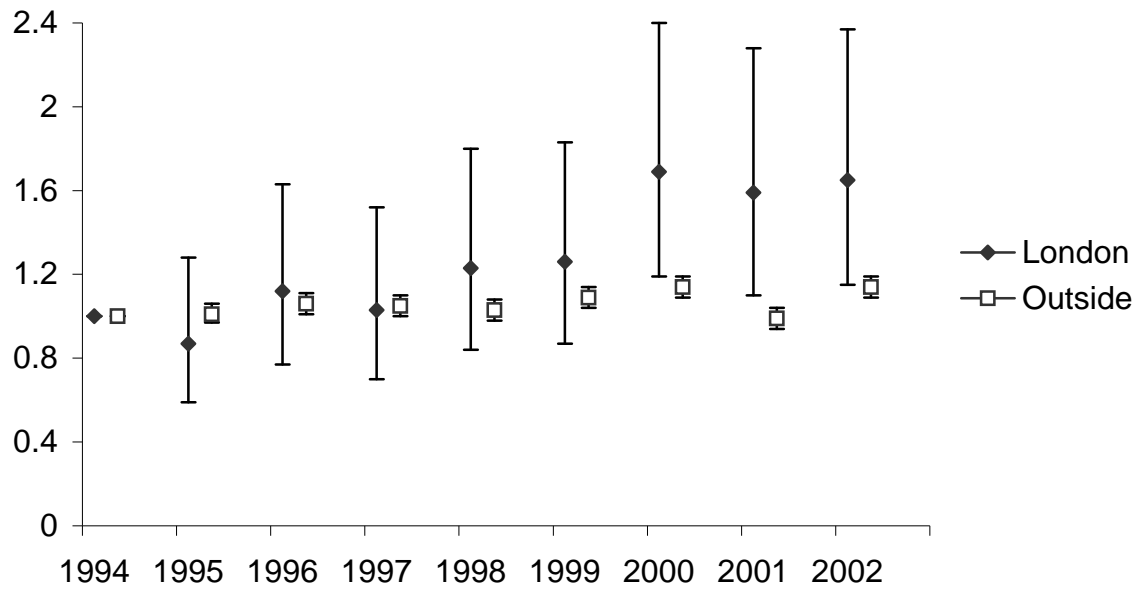
q) Starling



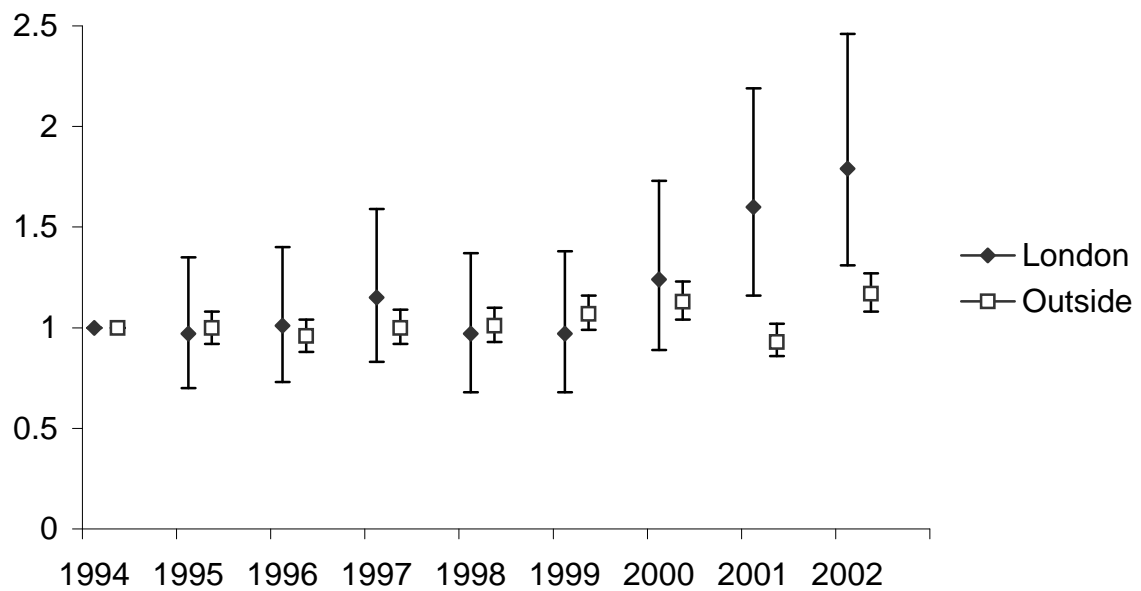
r) House Sparrow



s) Chaffinch



t) Greenfinch



u) Goldfinch

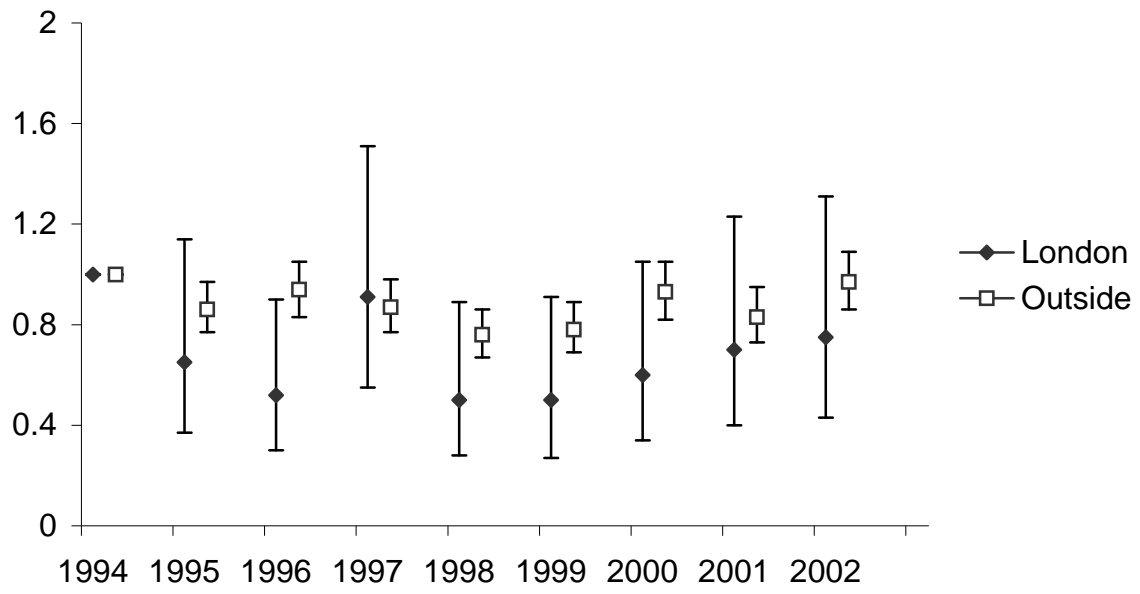


Table 1 Annual BBS indices within the Greater London Government Office Region for 21 common bird species for the period 1994-2002. 95% confidence intervals are shown in brackets. Indices are measured relative to the year 1994, which is set to one. A visual comparison of indices within and outside London (Southeast and East of England Government Office Regions) is shown in Figure 1.

Species	1994	1995	1996	1997	1998	1999	2000	2001	2002
Mallard	1	1.30 (0.95-1.77)	1.10 (0.80-1.53)	1.10 (0.78-1.54)	1.25 (0.91-1.72)	1.06 (0.76-1.47)	0.93 (0.66-1.31)	0.97 (0.70-1.35)	0.96 (0.67-1.36)
Feral Pigeon	1	1.04 (0.86-1.26)	1.03 (0.85-1.26)	1.22 (1.01-1.48)	0.97 (0.79-1.19)	1.11 (0.91-1.34)	0.89 (0.73-1.09)	0.76 (0.62-0.94)	0.92 (0.75-1.13)
Woodpigeon	1	0.91 (0.73-1.13)	1.36 (1.11-1.65)	1.19 (0.97-1.46)	1.39 (1.14-1.71)	1.40 (1.14-1.71)	1.55 (1.27-1.89)	1.59 (1.30-1.94)	1.40 (1.14-1.72)
Collared Dove	1	1.17 (0.90-1.52)	1.18 (0.91-1.55)	1.40 (1.08-1.82)	1.25 (0.95-1.65)	1.36 (1.03-1.78)	1.42 (1.08-1.87)	1.39 (1.06-1.82)	1.28 (0.97-1.71)
Swift	1	1.29 (0.89-1.89)	1.40 (0.95-2.04)	1.15 (0.76-1.72)	1.21 (0.81-1.81)	1.36 (0.92-2.02)	1.33 (0.90-1.98)	0.82 (0.53-1.26)	0.88 (0.57-1.36)
Wren	1	0.99 (0.82-1.18)	0.80 (0.66-0.97)	0.77 (0.63-0.94)	0.85 (0.70-1.03)	1.03 (0.86-1.24)	1.15 (0.96-1.37)	1.23 (1.04-1.47)	1.27 (1.07-1.51)
Dunnock	1	0.78 (0.59-1.02)	0.93 (0.72-1.21)	0.99 (0.76-1.28)	0.79 (0.60-1.05)	0.98 (0.75-1.27)	0.97 (0.74-1.26)	1.03 (0.79-1.35)	0.98 (0.74-1.28)
Robin	1	0.98 (0.81-1.19)	1.18 (0.98-1.42)	1.01 (0.83-1.23)	1.00 (0.82-1.22)	1.16 (0.96-1.41)	1.37 (1.14-1.64)	1.35 (1.12-1.63)	1.44 (1.20-1.73)
Blackbird	1	0.81 (0.71-0.91)	0.83 (0.73-0.94)	0.78 (0.69-0.89)	0.75 (0.65-0.85)	0.70 (0.62-0.80)	0.80 (0.70-0.91)	0.77 (0.68-0.88)	0.82 (0.72-0.93)
Song Thrush	1	1.39 (1.04-1.85)	0.97 (0.72-1.31)	0.85 (0.61-1.18)	0.83 (0.59-1.17)	0.89 (0.64-1.23)	0.96 (0.69-1.32)	0.58 (0.41-0.82)	0.89 (0.65-1.23)
Mistle Thrush	1	0.89 (0.59-1.33)	0.71 (0.46-1.08)	0.54 (0.34-0.86)	0.74 (0.48-1.13)	0.59 (0.38-0.92)	0.66 (0.43-1.02)	0.62 (0.40-0.98)	0.44 (0.27-0.72)
Blue Tit	1	0.79 (0.64-0.96)	1.07 (0.89-1.29)	1.01 (0.84-1.23)	1.22 (1.01-1.47)	1.22 (1.02-1.47)	1.23 (1.03-1.48)	1.17 (0.98-1.41)	1.18 (0.98-1.42)
Great Tit	1	1.21 (0.92-1.61)	1.24 (0.93-1.64)	1.25 (0.94-1.67)	1.48 (1.12-1.95)	1.94 (1.49-2.53)	2.01 (1.55-2.62)	2.05 (1.58-2.67)	1.76 (1.34-2.30)
Jay	1	0.76 (0.49-1.18)	0.96 (0.62-1.47)	1.11 (0.73-1.70)	0.78 (0.49-1.24)	0.64 (0.39-1.04)	0.82 (0.52-1.29)	0.96 (0.62-1.51)	1.18 (0.77-1.80)
Magpie	1	1.18 (0.97-1.42)	1.13 (0.94-1.37)	1.17 (0.97-1.42)	1.25 (1.03-1.52)	1.29 (1.06-1.56)	1.33 (1.10-1.61)	1.31 (1.08-1.60)	1.18 (0.96-1.44)
Carrion Crow	1	1.10 (0.86-1.40)	1.41 (1.12-1.78)	1.21 (0.94-1.55)	1.53 (1.20-1.94)	1.57 (1.24-1.99)	1.68 (1.33-2.11)	1.71 (1.35-2.16)	1.80 (1.43-2.27)
Starling	1	0.99 (0.84-1.15)	0.76 (0.65-0.90)	0.89 (0.76-1.05)	0.72 (0.60-0.86)	0.78 (0.65-0.93)	0.76 (0.64-0.91)	0.70 (0.58-0.84)	0.78 (0.65-0.93)
House Sparrow	1	0.97 (0.86-1.09)	0.83 (0.74-0.94)	0.72 (0.64-0.82)	0.58 (0.51-0.67)	0.47 (0.40-0.54)	0.40 (0.34-0.47)	0.33 (0.28-0.39)	0.29 (0.24-0.35)
Chaffinch	1	0.87 (0.59-1.28)	1.12 (0.77-1.63)	1.03 (0.70-1.52)	1.23 (0.84-1.80)	1.26 (0.87-1.83)	1.69 (1.19-2.40)	1.59 (1.10-2.28)	1.65 (1.15-2.37)
Greenfinch	1	0.97 (0.70-1.35)	1.01 (0.73-1.40)	1.15 (0.83-1.59)	0.97 (0.68-1.37)	0.97 (0.68-1.38)	1.24 (0.89-1.73)	1.60 (1.16-2.19)	1.79 (1.31-2.46)
Goldfinch	1	0.65 (0.37-1.14)	0.52 (0.30-0.90)	0.91 (0.55-1.51)	0.50 (0.28-0.89)	0.50 (0.27-0.91)	0.60 (0.34-1.05)	0.70 (0.40-1.23)	0.75 (0.43-1.31)

Table 2 Annual BBS indices in Southeast and East of England Government Office Regions, for 21 common bird species for the period 1994-2002. 95% confidence intervals are shown in brackets. Indices are measured relative to the year 1994, which is set to one. A visual comparison of indices within and outside London is additionally shown in Figure 1.

Species	1994	1995	1996	1997	1998	1999	2000	2001	2002
Mallard	1	1.12 (1.00-1.25)	1.05 (0.94-1.18)	0.96 (0.86-1.08)	1.12 (1.00-1.25)	1.16 (1.03-1.30)	1.13 (1.01-1.27)	1.04 (0.92-1.18)	1.24 (1.11-1.39)
Feral Pigeon	1	1.04 (0.86-1.27)	1.01 (0.83-1.24)	1.20 (0.98-1.45)	1.40 (1.16-1.70)	1.08 (0.89-1.32)	0.85 (0.69-1.05)	1.06 (0.87-1.30)	0.76 (0.61-0.94)
Woodpigeon	1	0.81 (0.75-0.87)	0.84 (0.78-0.90)	0.93 (0.87-1.00)	0.91 (0.84-0.98)	0.99 (0.92-1.06)	1.04 (0.97-1.12)	0.90 (0.83-0.97)	0.96 (0.89-1.03)
Collared Dove	1	1.09 (1.00-1.20)	1.16 (1.06-1.27)	1.22 (1.12-1.34)	1.24 (1.13-1.36)	1.42 (1.30-1.55)	1.39 (1.27-1.52)	1.30 (1.19-1.42)	1.49 (1.36-1.62)
Swift	1	0.76 (0.65-0.89)	0.60 (0.51-0.71)	0.72 (0.61-0.84)	0.96 (0.82-1.11)	1.26 (1.10-1.46)	0.71 (0.59-0.84)	0.96 (0.82-1.12)	0.64 (0.54-0.75)
Wren	1	1.07 (1.02-1.12)	0.71 (0.67-0.75)	0.63 (0.59-0.66)	0.75 (0.72-0.79)	1.00 (0.95-1.05)	0.99 (0.94-1.03)	0.90 (0.85-0.95)	1.00 (0.96-1.05)
Dunnock	1	1.00 (0.93-1.08)	0.97 (0.90-1.05)	0.83 (0.76-0.90)	0.93 (0.86-1.01)	1.07 (0.99-1.15)	1.01 (0.93-1.09)	0.85 (0.78-0.93)	1.09 (1.01-1.18)
Robin	1	1.11 (1.05-1.17)	1.13 (1.07-1.19)	0.94 (0.89-0.99)	0.96 (0.91-1.02)	1.08 (1.02-1.14)	1.17 (1.11-1.24)	0.98 (0.92-1.04)	1.21 (1.15-1.28)
Blackbird	1	0.96 (0.92-1.00)	0.95 (0.91-0.99)	0.88 (0.84-0.92)	0.93 (0.89-0.97)	1.01 (0.97-1.05)	1.00 (0.96-1.04)	0.98 (0.94-1.03)	1.07 (1.03-1.12)
Song Thrush	1	0.99 (0.91-1.06)	0.98 (0.91-1.06)	0.73 (0.67-0.79)	0.81 (0.75-0.88)	0.82 (0.76-0.89)	0.84 (0.77-0.91)	0.79 (0.73-0.86)	0.94 (0.87-1.02)
Mistle Thrush	1	0.98 (0.87-1.11)	0.93 (0.82-1.06)	0.80 (0.70-0.91)	0.81 (0.71-0.93)	0.87 (0.76-0.99)	0.81 (0.71-0.93)	0.61 (0.53-0.71)	0.78 (0.68-0.89)
Blue Tit	1	1.01 (0.95-1.07)	1.18 (1.12-1.26)	1.13 (1.07-1.20)	1.13 (1.07-1.20)	1.12 (1.05-1.19)	1.05 (0.99-1.11)	0.83 (0.77-0.88)	1.03 (0.97-1.10)
Great Tit	1	0.98 (0.91-1.05)	1.03 (0.96-1.10)	0.97 (0.90-1.04)	0.99 (0.92-1.07)	1.06 (0.98-1.14)	1.14 (1.06-1.23)	0.76 (0.70-0.82)	1.03 (0.96-1.11)
Jay	1	0.77 (0.66-0.90)	0.84 (0.72-0.97)	0.80 (0.68-0.93)	0.68 (0.58-0.80)	0.74 (0.63-0.87)	0.79 (0.67-0.92)	0.62 (0.52-0.74)	0.83 (0.71-0.97)
Magpie	1	1.08 (1.00-1.17)	1.08 (1.00-1.17)	1.10 (1.02-1.20)	1.10 (1.02-1.20)	1.17 (1.08-1.27)	1.17 (1.08-1.27)	1.05 (0.96-1.14)	1.09 (1.01-1.19)
Carrion Crow	1	0.93 (0.84-1.02)	0.94 (0.86-1.04)	1.05 (0.96-1.15)	1.12 (1.02-1.23)	1.29 (1.18-1.42)	1.24 (1.13-1.35)	1.02 (0.93-1.13)	1.18 (1.07-1.29)
Starling	1	0.85 (0.78-0.92)	0.78 (0.71-0.85)	0.84 (0.77-0.91)	0.70 (0.64-0.77)	0.76 (0.69-0.83)	0.66 (0.60-0.73)	0.71 (0.64-0.78)	0.59 (0.54-0.66)
House Sparrow	1	1.00 (0.94-1.07)	1.00 (0.94-1.06)	0.90 (0.84-0.96)	0.84 (0.79-0.90)	0.83 (0.78-0.89)	0.78 (0.73-0.83)	0.69 (0.64-0.74)	0.74 (0.70-0.80)
Chaffinch	1	1.01 (0.97-1.06)	1.06 (1.01-1.11)	1.05 (1.00-1.10)	1.03 (0.98-1.08)	1.09 (1.04-1.14)	1.14 (1.09-1.19)	0.99 (0.94-1.04)	1.14 (1.09-1.19)
Greenfinch	1	1.00 (0.92-1.08)	0.96 (0.88-1.04)	1.00 (0.92-1.09)	1.01 (0.93-1.10)	1.07 (0.99-1.16)	1.13 (1.04-1.23)	0.93 (0.86-1.02)	1.17 (1.08-1.27)
Goldfinch	1	0.86 (0.77-0.97)	0.94 (0.83-1.05)	0.87 (0.77-0.98)	0.76 (0.67-0.86)	0.78 (0.69-0.89)	0.93 (0.82-1.05)	0.83 (0.73-0.95)	0.97 (0.86-1.09)

Table 3 Results from the fitting of a linear trend across years within the Greater London Government Office region and Southeast and East of England Government Office Regions combined for the period 1994-2002 for 21 common bird species. We present the slope on a log scale with 95% confidence intervals and a test to examine whether the slope is significantly different from zero. We also test the significance of the interaction between the trend within and outside London to examine whether there is a significant difference in trends between these two geographic areas.

Species	Within London (1994-2002)				Southeast and East of England (1994-2002)				Test of interaction	
	Slope	95% CI	χ^2	<i>P</i>	Slope	95% CI	χ^2	<i>P</i>	χ^2	<i>P</i>
Mallard	-0.0263	-0.0592 – 0.0066	2.48	0.1155	0.0177	0.0068 – 0.0287	10.10	0.0015	2.40	0.1217
Feral Pigeon	-0.0293	-0.0484 – -0.0103	9.16	0.0025	-0.0252	-0.0440 – -0.0064	6.94	0.0084	0.06	0.8002
Wood Pigeon	0.0535	0.0344 – 0.0726	29.97	<0.0001	0.0101	0.0029 – 0.0173	7.51	0.0061	3.96	0.0467
Collared Dove	0.0314	0.0060 – 0.0569	5.84	0.0157	0.0426	0.0344 – 0.0507	104.65	<0.0001	0.34	0.5588
Swift	-0.0305	-0.0695 – 0.0086	2.35	0.1254	-0.0053	-0.0208 – 0.0102	0.45	0.5021	0.75	0.3851
Wren	0.0453	0.0272 – 0.0634	23.95	<0.0001	0.0083	0.0029 – 0.0136	9.19	0.0024	6.17	0.0130
Dunnock	0.0126	-0.0135 – 0.0387	0.90	0.3439	0.0049	-0.0029 – 0.0127	1.53	0.2159	0.12	0.7249
Robin	0.0487	0.0309 – 0.0665	28.62	<0.0001	0.0121	0.0068 – 0.0175	19.66	<0.0001	6.61	0.0102
Blackbird	-0.0187	-0.0320 – -0.0055	7.76	0.0053	0.0106	0.0065 – 0.0147	25.68	<0.0001	10.46	0.0012
Song Thrush	-0.0494	-0.0817 – -0.0170	9.09	0.0026	-0.0178	-0.0260 – -0.0097	18.47	<0.0001	1.69	0.1940
Mistle Thrush	-0.0756	-0.1227 – -0.0284	10.11	0.0015	-0.0409	-0.0542 – -0.0276	36.57	<0.0001	0.74	0.3884
Blue Tit	0.0345	0.0165 – 0.0526	14.00	0.0002	-0.0108	-0.0167 – -0.0049	12.78	0.0004	10.02	0.0015
Great Tit	0.0836	0.0593 – 0.1080	45.28	<0.0001	-0.0028	-0.0099 – 0.0043	0.59	0.4439	19.88	<0.0001
Jay	0.0131	-0.0310 – 0.0572	0.34	0.5614	-0.0248	-0.0406 – -0.0090	9.47	0.0021	1.17	0.2799
Magpie	0.0230	0.0044 – 0.0416	5.85	0.0155	0.0079	0.0001 – 0.0157	3.93	0.0475	1.17	0.2787
Carrion Crow	0.0681	0.0470 – 0.0892	40.04	<0.0001	0.0282	0.0194 – 0.0371	38.92	<0.0001	5.96	0.0146
Starling	-0.0349	-0.0531 – -0.0167	14.19	0.0002	-0.0522	-0.0618 – -0.0426	115.12	<0.0001	1.19	0.2761
House Sparrow	-0.1643	-0.1804 – -0.1481	432.61	<0.0001	-0.0469	-0.0535 – -0.0403	194.92	<0.0001	147.81	<0.0001
Chaffinch	0.0818	0.0479 – 0.1156	22.35	<0.0001	0.0116	0.0071 – 0.0160	25.60	<0.0001	7.43	0.0064
Greenfinch	0.0738	0.0425 – 0.1051	21.34	<0.0001	0.0156	0.0077 – 0.0236	14.82	0.0001	4.92	0.0266
Goldfinch	-0.0163	-0.0726 – 0.0399	0.32	0.5687	-0.0055	-0.0177 – 0.0066	0.80	0.3725	0.06	0.8093

Table 4 Change in abundance of 21 common bird species within the Greater London Government Office Regions and Southeast and East of England Government Office Regions combined as determined through the fitting over a linear trend across years. The index value for 2002 is presented (with associated 95% confidence intervals) relative to year 1994, which is set to 1. As an example, the House Sparrow in London with an index value of 0.27 in 2002, declined by about 73% (69-76%) over the period 1994-2002.

Species	Within London		Outside London	
	Index in 2002 relative to 1994	95% CI	Index in 2002 relative to 1994	95% CI
Mallard	0.81	0.62-1.05	1.15	1.06-1.26
Feral Pigeon	0.79	0.68-0.92	0.82	0.70-0.95
Wood Pigeon	1.53	1.32-1.79	1.08	1.02-1.15
Collared Dove	1.29	1.05-1.58	1.41	1.32-1.50
Swift	0.78	0.57-1.07	0.96	0.85-1.09
Wren	1.44	1.24-1.66	1.07	1.02-1.11
Dunnoek	1.11	0.90-1.36	1.04	0.98-1.11
Robin	1.48	1.28-1.70	1.10	1.06-1.15
Blackbird	0.86	0.77-0.96	1.09	1.05-1.12
Song Thrush	0.67	0.52-0.87	0.87	0.81-0.93
Mistle Thrush	0.55	0.37-0.80	0.72	0.65-0.80
Blue Tit	1.32	1.14-1.52	0.92	0.87-0.96
Great Tit	1.95	1.61-2.37	0.98	0.92-1.03
Jay	1.11	0.78-1.58	0.82	0.72-0.93
Magpie	1.20	1.04-1.39	1.07	1.00-1.13
Carrion Crow	1.72	1.46-2.04	1.25	1.17-1.35
Starling	0.76	0.65-0.87	0.66	0.61-0.71
House Sparrow	0.27	0.24-0.31	0.69	0.65-0.72
Chaffinch	1.92	1.47-2.52	1.10	1.06-1.14
Greenfinch	1.80	1.40-2.32	1.13	1.06-1.21
Goldfinch	0.88	0.56-1.38	0.96	0.87-1.05

ACKNOWLEDGEMENTS

The BBS is organised by the British Trust for Ornithology (BTO) and jointly funded by the BTO, the Joint Nature Conservation Committee (JNCC, on behalf of English Nature, Scottish Natural Heritage, Countryside Council for Wales and the Environment and Heritage Service in Northern Ireland) and the Royal Society for the Protection of Birds (RSPB). The success of the BBS is dependent on the huge effort, every year, or more than 2000 volunteer participants and regional organisers across the UK.

REFERENCES

Newson, S.E. & Noble, D.G. 2003. *Comparison of London wild bird population trends with those in the surrounding area*. Confidential Research Report No. 311. British Trust for Ornithology, The Nunnery, Thetford, Norfolk. IP24 2PU.

SAS. Institute Inc. (1996). SAS/Stat Software: Changes and Enhancements through Release 6.11. SAS Institute, Inc., Cary, North Carolina.

ter Braak, C.J.F., Van Strien, A.J., Meijer, R. & Verstrael, T.J. 1994. Analysis of monitoring data with many missing values: Which method? Bird Numbers 1992. Proceedings of the 12th International Conference of IBCC and OEAC Noordwijkerhout, The Netherlands. Statistics Netherlands, Voorburg/Heerlen & SOVON, Beek-Ubbergen.

