

BTO Research Report No. 198

**Breeding Birds in the
Wider Countryside:
their conservation status
(1972-1996)**

**A report of the BTO's Integrated Population
Monitoring programme**

H.Q.P. Crick, S.R. Baillie, D.E. Balmer, R.I. Bashford, L.P. Beaven, C. Dudley,
D.E. Glue, R.D. Gregory, J.H. Marchant, W.J. Peach and A.M. Wilson

July 1998

This work was undertaken within a Partnership between the British Trust
for Ornithology (BTO) and the Joint Nature Conservation Committee
as part of its programme of research into nature conservation

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EXECUTIVE SUMMARY

- 1) This report provides a species-by-species overview of the trends in breeding population size and reproductive success over 25 years, 1972-1996, of birds covered by BTO monitoring schemes. Twenty-five years is the period used to identify species that need to be included on the *Conservation Importance List* (JNCC 1996) and the UK Biodiversity Group Lists (Anon. 1995, 1998)
- 2) The report covers the majority of breeding bird species, excluding colonial seabirds which are well covered by the JNCC's Seabird Monitoring Programme (Thompson *et al.* 1998), and excluding the majority of species already covered by the Rare Breeding Birds Panel (Ogilvie 1996). Most wintering populations of waterfowl are well covered by the Wetland Bird Survey annual reports (e.g. Cranswick *et al.* 1997).
- 3) Population trends are described at the geographical scale of the UK as a whole.
- 4) The following BTO Alerts are made to JNCC and Country Agencies about worrying declines in population size, reproductive success or survival:

High BTO Alerts: 20 species: Grey Partridge, Snipe, Woodcock, Redshank, Turtle Dove, Lesser Spotted Woodpecker, Skylark, Tree Pipit, Song Thrush, Grasshopper Warbler, Goldcrest, Spotted Flycatcher, Willow Tit, House Sparrow, Tree Sparrow, Redpoll, Bullfinch, Yellowhammer, Reed Bunting, Corn Bunting.

Medium BTO Alerts: 20 species: Red-throated Diver, Moorhen, Lapwing, Curlew, Tawny Owl, Kingfisher, Meadow Pipit, Yellow Wagtail, Grey Wagtail, Pied Wagtail, Dunnock, Blackbird, Mistle Thrush, Willow Warbler, Marsh Tit, Raven, Starling, Greenfinch, Linnet, Twite.
- 5) Two species can be said to have recovered their population status since the *Conservation Importance List* was drawn up and would warrant inclusion no-longer: Swallow and Goldfinch.
- 6) The number of species showing long-term trends of declining population size approximately equalled the number showing increases. However, declines were particularly prevalent among seed-eating species, among farmland species and among grassland or marshland species.
- 7) Among species showing significant long-term trends in breeding performance per nesting attempt, the majority (78%) show an improvement over time. However, declines in breeding performance were again prevalent among seed-eating species, and among those associated with heathland, bog or upland habitats and those associated with waterbodies or coastal habitats.
- 8) The report will be produced at three-yearly intervals and is meant to be a working document to be used by conservation practitioners as a ready reference guide to the current changes in status of breeding birds in the UK. (Breeding distributions are not included as these are already fully documented in the *New Breeding Atlas* (Gibbons *et al.* 1993) and breeding population sizes are not included because these are to be reported regularly by the Avian Population Estimates Panel (Stone *et al.* 1997)). Feedback on how the value of future editions of this report could be improved is welcomed.

1. INTRODUCTION

Survey and monitoring form the bedrock for conservation. Without knowledge of the distribution and size of populations and how they are changing, the actions of conservationists must necessarily be based upon hunches and intuition that have a high chance of failing the species or habitats they wish to conserve.

Fortunately, for bird conservationists in the UK, there is a long tradition of volunteer support for ornithological surveys and monitoring, and the British Trust for Ornithology has been the medium for channelling much of these efforts towards well-structured programmes of increasing value. The statutory conservation bodies in the UK were farsighted enough to realise the superb cost-effectiveness of volunteer monitoring by contracting the BTO to provide monitoring data from the early 1960s. The Joint Nature Conservation Committee (JNCC) and its predecessor bodies have benefitted greatly from this work which provides it and the Country Agencies (English Nature, Scottish Natural Heritage and Countryside Council for Wales) with an unrivalled comprehensive overview of the long-term trends for a major component of the UK's wildlife. This overview covers changes in population size as well as changes in reproductive success and survival that might have caused the population changes. When a declining population is detected, the BTO can inform conservationists of which stage of the life-cycle appears to have been detrimentally affected. Conservationists are thereby able to target their action or further research effectively. This is the main function of the BTO's Integrated Population Monitoring programme for UK birds (Greenwood *et al.* 1993, 1995).

The value of the monitoring work undertaken by the BTO is recognised in the Government's Biodiversity Steering Group report (Anon. 1995). The BTO's results, particularly on declining farmland species, are highlighted as showing "how broadly based surveillance can identify important new trends". More generally, the report states that monitoring is "essential if broad aims, specific objectives and precise targets are to be achieved". It notes that baselines must be established; that regular and systematic recording must be made to detect change; and that the reasons for change should be studied to inform action. The BTO's monitoring schemes fulfil a considerable portion of these needs for a wide range of bird species in the UK.

1.1 The BTO's monitoring of breeding birds in the UK

The Integrated Population Monitoring Programme has been developed by the BTO under the BTO/JNCC contract to monitor the numbers, breeding performance and survival rates of a wide range of bird species. It has the following specific aims (Baillie 1990, 1991):

- (a) To establish thresholds that will be used to notify conservation bodies of requirements for further research or conservation action.
- (b) To identify the stage of the life cycle at which changes are taking place.
- (c) To provide data that will assist in identifying the causes of change.
- (d) To distinguish changes in populations induced by human activities from those that are natural population fluctuations.

The programme brings together data from several long-running BTO schemes. Changes in numbers of breeding birds are measured by the Common Birds Census, Waterways Bird Survey and Constant Effort Sites Scheme (based on bird ringing). The recently established BTO/JNCC/RSPB Breeding Bird Survey can only provide information on short-term population changes at the moment, but will gradually develop into the major component of this work. The Nest Record Scheme and Constant Effort Sites Scheme provide data on productivity, while the Ringing Scheme and Constant Effort Sites Scheme provide data on survival rates.

Increasingly it is being realised that monitoring population size or density is not enough for conservationists (Goss-Custard 1993); the monitoring of reproductive and survival rates are essential to allow efficient interpretation of changes in population size (Temple & Wiens 1989) and, in the case of long-lived species, to provide early warning of impending changes in population size (Pienkowski 1991).

There are good theoretical reasons why population density can be a misleading indicator of habitat quality and population productivity (e.g. van Horne 1983) and good empirical studies have shown that densities are not necessarily related to habitat quality in a linear manner (e.g. Ratcliffe 1976, Pienkowski & Evans 1982, Watson *et al.* 1987, Vickery *et al.* 1992, Lawton 1996). Conservation management decisions based solely on changes in population size will have a high chance of being inappropriate (Lawton 1993).

For both short and long-lived species, declines in population size may be due to loss of habitat or a decline in habitat quality leading to decreasing productivity or survival. Without access to good long-term datasets of productivity and survival, remedial conservation action has to be taken without a sound basis or has to wait until some detailed investigative research has been undertaken. The former scenario may provide misjudged action, which is both wasteful of resources and ineffective; the latter scenario defers action, allowing a situation to worsen, increasing the cost of subsequent action or even making restitution impossible.

Additionally for long-lived species, declines in population size may only occur after long periods of low survival or reproduction. The classic example is that of the Peregrine, which in the UK suffered from poor productivity during the 1940s and 1950s, due to DDT contamination, thereby decreasing the buffering capacity of the non-breeding population to withstand severe mortality of breeding adults due to cyclodiene poisoning from the middle 1950s onwards (Ratcliffe 1993). Monitoring of breeding numbers would not have revealed the problem as efficiently as an "early warning" provided by the monitoring of productivity (Pienkowski 1991). Another recent example where declines in productivity have preceded declines in population size is provided by the catastrophic breeding failures of seabirds, and particularly Arctic Terns, in Shetland (Monaghan *et al.* 1989, Walsh *et al.* 1995).

1.2 The value of combining results from different monitoring schemes.

A current and important example relates to severe declines in the population size of 10-20 species of birds on farmland measured by the Common Birds Census over the past 15-20 years. This has identified a major problem in the wider countryside that has to be tackled by conservationists

(Fuller *et al.* 1996). While the problem has been identified, the proximate causes of these declines could be changes in productivity or in survival. Autecological studies of these 10-20 species would be very costly. Such studies would not necessarily be representative of the wider countryside because intensive study plots would be small. They would not produce any reliable or consistent results for 3-5 years. A study funded by the Ministry of Agriculture, Fisheries and Food is currently investigating the causes of declining farmland seed-eating birds, using the BTO's extensive datasets, and will produce results relatively quickly (e.g. Siriwardena *et al.* 1998).

Results from the Nest Record Scheme have revealed which species have suffered declines in productivity that parallel declines in population size (e.g. Linnet). More detailed analyses can relatively quickly probe such preliminary results to show, for example, that every aspect of Corn Bunting and Skylark productivity per nesting attempt has increased markedly during their population declines (Crick 1997, Chamberlain & Crick in press). In this way the Nest Record Scheme has been able to direct conservation research towards investigating survival rates outside the breeding season for species such as Corn Bunting, but towards the nesting season for Linnet (cf. Biodiversity Steering Group Action Plans for these species: Anon. 1995, 1998). Analyses of Nest Record Cards have suggested that research on declining Golden Plover (Crick 1992a) and Twite (Brown *et al.* 1995) populations in England should be concentrated on productivity studies and provided useful information for English Nature's research programmes on these species. The value of the Nest Record Scheme's data is further highlighted by the inclusion of their analysis in a number of Biodiversity Steering Group Action Plans (Anon. 1998).

Similarly, BTO-led studies of the Lapwing population have shown that productivity declines and not changes in survival appear to have driven its population decline (Peach *et al.* 1994). Detailed analysis of the decline of the Song Thrush population has shown that declines in first-year survival rates were sufficiently large to account for the observed changes in population size; other aspects of survival and productivity have not varied sufficiently to have had a major impact (Baillie 1990, Thomson *et al.* 1997). Analyses of declining Sedge Warbler populations using data from a variety of BTO monitoring schemes showed that changes in over-wintering survival, associated with below average rainfall in the Sahel wintering quarters, was the most important factor determining population change (Peach *et al.* 1991). Analyses of the population dynamics of seven Palaearctic-African migrant passerines have shown that over-wintering survival was the most important factor in all cases (Baillie & Peach 1992).

The ability to distinguish quickly, the stage of the life-cycle most affected during population declines will be particularly important when the conservation agencies begin to consider the plight of species listed on the Conservation Importance Lists (JNCC 1996; Anon. 1995, 1998). These lists were drawn up using data from the BTO's Common Birds Census (and other sources of information) to prioritise species of birds of conservation concern. The value of the BTO's historical databases in helping to diagnose the problems facing these species will be invaluable and more cost-effective than initiating between 50 and 100 individual autecological studies.

Of course, this is not the only function of the BTO's Integrated Population Monitoring programme, because, once conservation actions have been initiated, their successes will be

monitored and be assessed against the background information provided by the BTO's long-term schemes. This is the only way that conservation bodies can measure the effectiveness of their actions at a national scale in a cost-effective manner.

1.3 The aims of this report

The aims of this report are as follows:

- 1) To provide a species-by-species overview of the trends in breeding population size and reproductive success of birds covered by BTO monitoring schemes over the past 25 years. This time period is that used to identify species that need to be included on the Conservation Importance Lists (JNCC 1996; Anon. 1995, 1998).
- 2) To cover the majority of breeding species, excluding colonial seabirds which are well covered by the JNCC's Seabird Monitoring Programme (Thompson *et al.* 1998), and excluding the majority of species already covered by the Rare Breeding Birds Panel (Ogilvie 1996). Most wintering populations of waterfowl are well covered by the Wetland Bird Survey annual reports (e.g. Cranswick *et al.* 1996).
- 3) To cover the UK as a whole.
- 4) To provide early warning alerts to JNCC and Country Agencies about worrying declines in population size or reproductive success, with special reference to species on the *Conservation Importance Lists*.
- 5) To provide a brief synthesis of the species trends, in terms of common trends within species grouped by habitat or foraging habits.
- 6) To indicate how the report will be developed over the coming years.

The report will be produced regularly and it is meant to be a working document to be used by conservation practitioners as a ready reference guide to the current changes in status of breeding birds in the UK. (Breeding distributions are not included as these are already fully documented in the *New Breeding Atlas* (Gibbons *et al.* 1993) and breeding population sizes are not included because these are to be reported regularly by the Avian Population Estimates Panel (Stone *et al.* 1997)).

The report is produced as part of the BTO's work carried out under contract to the Joint Nature Conservation Committee on the behalf of English Nature, Scottish Natural Heritage, the Countryside Council for Wales, and the Environment and Heritage Service in Northern Ireland.

After a section which outlines the methodologies of the monitoring schemes that produce the information contained in the report, there is a species-by-species summary of trends from census, nest recording and ringing schemes. Species are listed in taxonomic (Voous) order.

2. METHODOLOGY

Six monitoring schemes have contributed data to this report. Five provide data on changes in population size: Common Birds Census; Waterways Bird Survey; Breeding Bird Survey; Heronries Census; and Constant Effort Sites ringing scheme. Two schemes provide data on changes in productivity: Nest Record Scheme and Constant Effort Sites Scheme. In addition, information from detailed analyses of the recoveries of birds from the Ringing Scheme is included when relevant.

The methodologies of the monitoring schemes are described below, including information on fieldwork, data preparation, sampling considerations and statistical methods used to analyse the data.

2.1 Common Birds Census

The results from the Common Birds Census (CBC) provide estimates of population trends for almost all of the commoner breeding species in Britain. Annual counts of birds during the breeding season on between 200 and 300 plots around the country allow comparisons of population levels on a year-to-year basis. Focusing on farmland and woodland habitats, the CBC provides reliable indices of population change for around 60 species.

The CBC has been running since 1962 and was instigated to provide sound numerical information on farmland bird populations in the face of rapid changes in agricultural practice. Fieldwork is carried out by a team of dedicated volunteers, currently around 250 strong. The same observers survey the same plots using the same methods year after year. On average, plots are censused for around seven consecutive years but some observers have now been surveying the same sites since the CBC's inception in the early 1960s.

Originally, emphasis was on farmland plots but other habitats including woodland were added shortly afterwards. The sample of farmland plots contains most of the main agricultural land-uses, with plots averaging around 80 hectares in extent. Woodland plots are generally smaller, averaging just over 20 hectares. A small number of plots of other habitats are surveyed annually, including heathlands and small wetlands.

A territory-mapping approach is used to estimate the number and positions of territories of each species present on each survey plot during the breeding season. Volunteers visit their survey plot ten times between late March and early July and all contacts with birds, either by sight or sound, are plotted on large-scale maps. Codes are used to identify the birds' species, sex and age where possible, and also to record activity such as song or nest-building. The registrations are then transferred to species maps, which are returned to the BTO for analysis.

The pattern of registrations reveals the numbers of territories for each species. By applying rigorous rules while analysing the species maps, we can be sure that there is consistency between our estimates from year to year. Comparison of territory totals with those for the same plots in previous years gives estimates of change between years and allows the production of a long-

running population index for each species. In 1990, the results from the Common Birds Census were brought together in the book *Population Trends in British Breeding Birds* (Marchant *et al.* 1990). This landmark publication discussed long term population trends for the years 1962 to 1988 for 164 species, with graphs showing CBC population indices for around two-thirds of these.

Observers also provide detailed habitat maps and information from their plots. This makes it possible to match the distribution of bird territories with habitat features, providing the potential for detailed studies of bird-habitat relationships.

The CBC was the first national breeding bird monitoring scheme of its kind anywhere in the world and has become the standard by which others schemes and surveys are compared. The territory mapping method adopted by the CBC is acknowledged as the most efficient way of estimating breeding bird numbers in small areas. As the CBC is often regarded as the benchmark by which other survey methods are compared, it is important that its validity and limitations are understood. There have been many validation studies of the CBC, mainly by the BTO itself. Snow (1965) compared CBC mapping and intensive nest-finding, concluding that mapping censuses are good indicators of breeding population size for 70% of species. Experiments to test differences between observers' abilities to detect birds found that although there was considerable variation between individual abilities, the observers were consistent from year to year (O'Connor & Marchant 1981). As the CBC relies on data from plots covered by the same observer in consecutive years, this source of bias will not have implications for the CBC's ability to identify population trends. It has also been found that the sample of plots from which CBC results are drawn has not changed in composition or character over the years (Marchant *et al.* 1990) and similarly that the results of territory analysis are not affected by changes in analysts, once trained (O'Connor and Marchant 1981). Fuller *et al.* (1985) found that farmland CBC plots were representative of ITE land-classes and cropping patterns in lowland England. Work by Moss (1985) examined the extent to which spurious random fluctuations can develop within CBC indices. It was concluded that such changes were small in relation to levels of population change estimated by CBC data.

The CBC is recognised as having many strengths and has been a keystone of bird population monitoring within the United Kingdom for more than three decades. However, all monitoring programmes are subject to compromises between the theoretical ideal and what is practicable and cost-effective. The weaknesses of the CBC are largely related to the fact that both fieldwork and analysis are very time-consuming. This inevitably limits the numbers of volunteer birdwatchers who are able to participate in the scheme with the result that areas of low human population density (and therefore density of birdwatchers) are under-represented (Figure 2.1). The constraints imposed by the relatively small sample size mean that it was felt necessary to concentrate on farmland and woodland habitats, with the results that bird population trends in built-up areas and the uplands are little known. As the plots are chosen by the observers, it may be that plots are not always representative of the surrounding countryside and there may be some bias towards bird-rich habitats. It is for these reasons that the Breeding Bird Survey (see 2.3 below) was introduced in 1994 and both surveys will continue for several years in order to allow calibration between the schemes.

Population changes are modelled using the Mountford method (Mountford 1982,1985) with a 6-year moving window (Peach & Baillie 1994). This method compares changes in abundance across all years for which there are data and expresses the indices as departures from the mean over the time period considered. Counts are modelled as the product of site and year effects on the assumption that between-year changes are homogeneous across plots. Mountford indices have then been smoothed using a compound running-medians algorithm (Vellerman & Hoaglin 1981). Smoothing was used to remove short-term fluctuations (e.g. those caused by periods of severe weather and measurement error), and thus reveal the underlying pattern of population change. Confidence limits on the indices were estimated using a resampling method (bootstrapping) and thus do not make any assumptions about the underlying distribution of counts.

Indices are plotted as the thicker line on the graphs, and provide a relative measure of population size on an arithmetic scale with a mean value of 1.0 (e.g. Siriwardena *et al.* 1998). If an index value increases from 1 to 2, the population has doubled, if it declines from 1 to 0.5, it has halved. The two thinner lines on the graphs above and below the index line are the upper and lower 95% confidence intervals. These show the confidence we can attach to the indices. Narrow confidence intervals indicate that the index series is estimated precisely, wider intervals indicate that it is less precise.

Where possible, separate indices were calculated for farmland, woodland and all CBC plots, and indices from the latter selection are presented graphically in the species accounts. In some cases, however, we were unable to calculate indices for the different habitat types and only the single index for all CBC plots is presented.

2.2 Waterways Bird Survey

The Waterways Bird Survey (WBS) has monitored 19 riparian bird species on canals and rivers throughout the United Kingdom since 1974. As with the Common Birds Census (CBC), the territory mapping method is used to estimate the breeding population of waterbirds on each plot and shows in detail each bird's habitat usage. The plots average 4.4 km in length; almost half are slow-flowing lowland rivers with the rest either fast-flowing rivers/streams or canals. There are currently around 120 plots distributed throughout the United Kingdom. Geographical spread is slightly different to that of the CBC because there is a higher proportion of plots in the north and west of England. Wales and Scotland are again rather poorly covered.

As with the CBC, all fieldwork is carried out by volunteers. Observers are asked to survey their plot on nine occasions between March and July, mapping all the birds seen or heard onto 1:10,000 scale maps. Registrations are then transferred to species maps which are analysed to reveal the numbers and positions of territories for each species. Following the withdrawal of JNCC funding, observers were asked to complete their own territory analysis, based on issued guidelines, for the first time in 1994. This has successfully speeded up the processing of WBS data. The results are still checked by BTO staff, and observers' analyses have been found to be consistent with those of BTO analysts.

Population changes are reported annually in *BTO News* for 19 riparian species, five of which are not covered by the CBC and many of the others are found in higher numbers in the WBS sample than in the CBC sample. Long-term trends were summarised in *Population Trends in British Breeding Birds* (Marchant *et al.* 1990) and in the 1992-93 annual report (Marchant & Balmer 1994). For those species covered by both CBC and WBS, there is generally much agreement between the population indices from the two schemes. However, there are one or two exceptions, such as for Lapwing, the populations of which declined rapidly on arable farmland during the late 1980s while numbers on WBS plots, typically representing populations along river flood plains, showed greater stability.

As the WBS employs the same methods as the CBC, the validation studies carried-out for the latter generally hold true for the WBS (see 2.1 above). Marchant *et al.* 1990 found that there has been little change in the composition of the WBS sample in terms of plot habitat type or geographical spread.

Population indices were estimated using the methods described in section 2.1. A single index series was created for each species using all the WBS plots occupied by that species.

2.3 Breeding Bird Survey

In 1994 the BTO/JNCC/RSPB Breeding Bird Survey (BBS) was launched following two years of extensive pilot work and a number of earlier desk-based studies. The introduction of the BBS was a response to the limitations of the Common Birds Census (CBC), which has monitored bird populations since 1962. It was recognised that there was a need to improve the geographical representation of UK bird monitoring and, thereby, both species and habitat coverage. The BBS uses line transects rather than the time consuming territory mapping method used by the CBC. This makes the survey relatively quick and convenient to undertake, thereby encouraging a larger number of volunteers to take part.

Survey squares are 1 x 1 km in size. They are selected using a stratified random sample from within 83 sampling regions. In most cases, these are standard BTO regions based on membership distribution. BBS regions with larger numbers of potential volunteers are allocated a larger number of squares enabling more birdwatchers to become involved in these areas. Note that this does not introduce bias in the results because the analysis takes each region separately in drawing up national statistics. The BBS requires a relatively large sample of survey squares and the aim is to maintain coverage of between two and three thousand squares in the UK. Fieldwork is coordinated through a network of BBS Regional Organisers.

Fieldwork involves three visits to each survey square each year. The first is to record details of habitat and to establish the survey route, the second and third to count birds. A survey route is made up of two parallel lines, each 1 km in length, although for practical reasons routes typically deviate somewhat from the ideal. Each of these lines is divided into five sections, making a total of ten 200 m sections, and birds and habitats are recorded within these units. The two bird-count visits are made about four weeks apart (ideally early May and early June), ensuring late migrants are recorded. Volunteers record all the birds they see or hear as they walk along their transect

routes. Birds are noted in three distance categories (within 25 m, 25-100 m, or more than 100 m on either side of the line) measured at right angles to the transect line, or as in flight. Recording birds within distance bands is important because it provides a measure of bird detectability in different habitats and allows population densities to be estimated. The average time observers spend per visit is around 90 minutes.

1569 1-km squares were surveyed in the first year (1994), 1750 in 1995 and 1917 in 1996, increasing steadily towards the target of between 2000-3000. The geographical spread of survey squares and the habitats are indicated in Figure 2.2 and Table 2.3.1. More than 200 species have been recorded so far, 86 from more than 100 squares and a further 14 species from 50-100 squares. (For a small number of species, which are colonial or flocking in habit, it is unclear how well they are monitored by the BBS but they are not currently monitored by other BTO schemes; these are listed in Appendix 1).

Change measures between years are assessed using a loglinear model with Poisson error terms. The highest species count from early or late counts for each square (or single count if a square was only visited once in the breeding season) is used in the model. Counts are modelled as a function of square and year effects. Each observation is weighted (by the number of 1-km squares in each region divided by the number of squares counted in that region) to correct for the under- or over-sampling of BBS regions within the UK. The upper and lower confidence limits of the changes indicate the certainty that can be attached to each change measure. When the limits are both positive or both negative, we can be 95% confident that a real change, i.e. a statistically significant change, has taken place.

2.4 Heronries Census

The aim of this census is to collect annual nest counts of Grey Herons *Ardea cinerea* from as many sites as possible in the United Kingdom. The Heronries Census began in 1928 and is the longest-running monitoring scheme for any European bird. Volunteer observers make counts of nests at heron colonies each year. Changes in the numbers of nests, especially over periods of several years, are a clear measure of the population's trend.

Coverage is coordinated by a network of regional organisers. A core of birdwatchers and ringers monitor their local colonies annually, providing a backbone of regular counts. Around two-thirds of the heronries in England and Wales are counted each year, providing an accurate estimate of population changes in those two countries (Figure 2.3). Rather few counts are made of heronries in Scotland and Northern Ireland. Counts are submitted to the BTO on cards and the data is entered onto computer at BTO headquarters. As the number of heronries cards submitted is relatively small and the information is of a straightforward nature, staff time required to administer the scheme is relatively small while the data gathered are much more comprehensive than for many species of similar abundance.

As a predator at the top of the freshwater food-chain, Grey Herons are excellent indicators of environmental health in the countryside. Population changes are estimated by comparing counts summed across all heronries counted in each of two consecutive years. The estimates of

population change are published in *BTO News* annually. Complete heronries censuses were carried out in England and Wales in 1928, 1954 and 1964 while a census covering the whole UK was made in 1985. The trend graph provided in section 3.4 is calculated by combining the annual estimates of population change with the results from these full censuses to estimate the breeding population (in terms of number of occupied nests) of Grey Herons in England and Wales annually. The trend was analysed by regressing $\log(\text{number of nests})$ against Year and Year², to reveal how population abundance has changed over the past 25 years. Percentage change was calculated from the start and end points of the regression line. The significance level of this trend line is not provided because the standard assumptions of regression analysis are violated since individual data points cannot be regarded as independent (the same nest counts were used in the calculation of index values for different years).

2.5 Constant Effort Sites Scheme

The Constant Effort Sites (CES) Scheme uses changes in catch sizes across a network of more than 100 standardised mist-netting sites to monitor changes in the abundance and breeding success of common passerines in scrub and wetland habitats. At each constant effort site, licensed ringers erect a series of mist-nets in the same positions, for the same amount of time, during 12 morning visits between May and August. Year-to-year changes in the number of adults caught provide a measure of changing population size, while the proportion of young birds in the total catch is used to monitor annual productivity (breeding success). By monitoring the abundance of young birds between May and August the CES method should integrate contributions to annual productivity from the entire nesting season including second and third broods for multi-brooded species. Between-year recaptures of ringed birds can also be used to calculate annual survival rates, although this requires specialised analytical techniques (e.g. Peach 1993) and is not considered further here. Further details of the CES Scheme and methods of analysis are presented in Peach *et al.* (1996).

The CES Scheme began in 1983 with 46 sites and by 1996 had expanded to encompass 122 sites spread throughout the UK. The distribution of CES sites tends to reflect the distribution of ringers within the UK and Ireland. In 1996, 101 sites were operated in England, 11 in Scotland, 5 in Wales, 3 in Northern Ireland and 2 in the Republic of Ireland. In this report we summarise changes in catch sizes of adults and young, and in the percentage of young, between 1983 and 1996 for 28 species of passerines. Changes in the abundance of adults and young were assessed through application of loglinear Poisson regression models in which year effects (annual changes in abundance) were constrained to change in a linear manner (on a log scale) over time. This provides a simple overall measure of change in abundance over the study period and a test of the statistical significance of the change. At sites where annual catching effort fell below the required 12 visits, annual catch sizes were corrected according to experience during years with complete coverage (see Peach *et al.* in prep for full details). Over-dispersion in some of the juvenile catch data was incorporated into the Poisson regression models where appropriate. Long-term trends in productivity are assessed by regressing the annual percentage young in the total catch against year. In these linear regressions each annual observation was weighted by the reciprocal of the variance of the percentage of young, in order to allow for changing sample sizes over time.

2.6 Nest Record Scheme

The BTO's Nest Record Scheme is the largest, longest running and most highly computerised such scheme in the world and possesses the most advanced and efficient techniques of data gathering, data capture and analyses. There are currently more than 1,000,000 records held by the Trust, of which 35% are computerised.

The primary aim of the Nest Record Scheme is to monitor annually the breeding performance of a wide range of UK birds as a key part of the BTO's data collection. Annual reports are published (e.g. Crick *et al.* 1998) and the significant results communicated immediately to JNCC. Another primary aim is to undertake detailed analyses of breeding performance of species of conservation interest (e.g. Brown *et al.* 1995, Crick *et al.* 1994, Crick 1997, Peach *et al.* 1995).

The Nest Record Scheme gathers data on the breeding performance of birds in Britain and Ireland through a network of volunteer ornithologists. Each observer is given a code of conduct that emphasises the responsibility of recorders towards the safety of the birds they record and explains their legal responsibilities. These observers complete standard nest record cards for each nest they find, giving details of nest site, habitat, contents of the nest at each visit and evidence for success or failure. When received by the BTO staff, the cards are checked, sorted and filed away ready for analysis. Those for Schedule 1 species are kept confidential. Computer programs developed by BTO check the data for errors and calculate first-egg-date, clutch size, nest loss rates at egg and chick stages. Data are computerised according to priorities for population monitoring and for specific research projects.

Currently the BTO receives a total of more than 30,000 records each year for around 180 species. Typically, the BTO receives more than 150 records for 55 species and more than 100 for a further 10-15 species. The quality of records improved substantially in 1990 with the introduction of the new recording card, which promotes greater standardisation and clarity in the information recorded by observers. The general distribution of Nest Record Cards is patchy at the county scale but is more even over larger regions of the UK. Overall, Northern Ireland and parts of Scotland (southeast, Western Isles) and parts of England (west midlands, southwest) have relatively low coverage, often reflecting observer density. A major analysis of trends over time in various aspects of breeding performance found relatively few differences between major regions in the UK, when analysed using analysis of covariance (Crick *et al.* 1993). Habitat coverage is broad since the scheme receives records from all the UK's major habitats. Most records come from woodland, farmland and freshwater sites, but the scheme also receives data from scrub, grassland, heathland and coastal areas.

Six different variables were analysed for this report: laying date (where day 1 = January 1); clutch size; brood size; and daily nest failure rates during egg and nestling stages and from egg-laying through to fledging, calculated from the methods of Mayfield (1961, 1975) and Johnson (1979).

In order to minimise the incidence of errors and inaccurately recorded nests, a set of rejection criteria was applied to the data: laying date only included cases where precision was within ± 5

days; clutch size was not estimated for nests which had been visited only once, for nests which were visited when laying could still have been in progress, or for nests which were only visited after hatching; and maximum brood size was calculated only for nests which were observed after hatching. The last variable is an underestimate of brood size at hatching because early losses of individual chicks may be missed by observers; it differs from clutch size because eggs may be lost during incubation and hatching success may be incomplete.

Daily failure rates of whole nests were calculated using Mayfield's (1961,1975) method and standard errors were calculated after Johnson (1979) (these methods and their assumptions are fully reviewed in Crick & Baillie 1996). Daily nest failure rates were calculated for egg and nestling periods separately, as well as together ("egg-to-fledge"), each calculation assuming that failure rates were constant during the period considered. Violations of this assumption of the Mayfield method can lead to biased estimates if sampling of nests is uneven over the course of each period. It is unlikely that any such bias would vary from year to year, so although absolute failure rates may be biased, annual comparisons should be unaffected. In this report, therefore, we present only temporal trends in daily nest failure rates.

Statistical analyses of nest record data were undertaken using SAS programs (SAS 1990). Regressions through annual mean laying dates, clutch sizes, brood sizes and nest failure rates were weighted by sample size. Quadratic regressions were used when the inclusion of a quadratic term provided a significant improvement over linear regression.

Results are only presented if the total sample size of records for a particular variable and species exceed 100, and are presented with a caveat for small sample sizes if the number of records contributing data was between 100 and 250.

2.7 The Alert System

A major function of the BTO's monitoring programme is to alert the JNCC and Country Agencies to severe or developing declines in the status of any species of bird. These can include declines in population size or declines in breeding performance or survival. To provide ease of reference to lists of species of conservation importance that form the basis of current conservation policy we have used criteria that are similar to those used in these lists (see section 3).

Alerts are issued at two levels:

1) High BTO Alert:

- for species which have shown a decline in abundance of at least 50% over the past 25 years, or over the duration of the shorter-running Waterways Bird Survey (23 years) or Constant Effort Sites Scheme (14 years) (whichever is the most appropriate scheme for monitoring the species).

- for species which have shown a sufficiently large fall in breeding performance or survival that population size is likely to be severely affected (when population size is not monitored adequately).

2) Medium BTO Alert:

- for species which have shown a decline in abundance of 25-49% over the past 25 years, or over the duration of the shorter-running Waterways Bird Survey (23 years) or Constant Effort Sites Scheme (14 years) (whichever is the most appropriate scheme for monitoring the species).
- for species which have shown a statistically significant decline in breeding performance or survival.

In addition, we note "Recovery" for those species currently on the *Conservation Importance Lists* (JNCC 1996; Anon. 1995, 1998) due to declines in abundance as measured by the Common Birds Census but which would no longer warrant inclusion if the lists were drawn up using the monitoring data in this report.

It should be noted that the the *Conservation Importance Lists* were drawn up using very conservative criteria, and that BTO Alerts are issued for some species that would not satisfy these criteria. For example, the CBC has measured severe population declines for species that are monitored only in areas which are not wholly representative of the majority of the species' ranges in the UK. However, we consider that such declines are potentially important and, following the precautionary principle, need to be raised with the conservation authorities. For example, the severe decline (56%) of Tree Pipits on CBC plots indicates an important problem for the species in southern England. Although Tree Pipits occur at higher densities in upland areas of Wales, north England and Scotland, they have not been monitored there until the advent of the BBS. The declines in southern England may or may not be an indicator of declines elsewhere in the Tree Pipit's range but unless conservation organisations are alerted to the fact, they will not be able to make informed decisions about the possibility. Further, although we have been able to provide confidence limits for the trends in population size shown in this report, we have still issued alerts for species that have declined by >25% even though their trends are sometimes encompassed by extremely wide confidence limits. This is because the confidence limits will necessarily become wider as bird densities decrease, and it would seem reckless to ignore the population decline of a species such as the Corn Bunting simply because it has become almost too rare to monitor.

In addition, we use declines measured by the WBS and CES as the basis for BTO Alerts when these schemes are appropriate for monitoring any particular species. Thus, for instance, Yellow Wagtail is as well monitored by the WBS as CBC. Thus we issue an alert for this species given a 39% decline on WBS plots, even though it has increased by 5% on CBC plots.

Finally, we issue some alerts on the basis of significant declines in productivity as measured by the Nest Record Scheme. This is done occasionally in the absence of information on population

change when declines in productivity may be the only indication we have of the “health” of a particular species in the UK. Occasionally it is done for species that have declined in abundance by less than 25% but for which declines in productivity may presage a population decline.

3. SPECIES ACCOUNTS

Depending on the availability of data (all species are not covered by each scheme), each account usually consists of the following:

1) *Species Name & Alert Status*: next to species name we state whether the BTO issues either an **Alert**, on the basis of changes in population abundance or demography or whether the species has undergone some population **Recovery** since it was listed on the *Conservation Importance Lists* (see section 2.7, above).

2) *Conservation importance*: the conservation status of the species is graded with reference to the JNCC/Country Agency *Conservation Importance List* (JNCC 1996) as follows:

- **Table 1**: IUCN globally threatened species. These species require monitoring of populations and the preparation of International Species Action Plans to ensure effective conservation.
- **Table 2**: Uncommon and, rapidly or historically, declining British breeding birds. These species require monitoring of populations and the preparation of Species Action Plans to ensure their effective conservation.
- **Table 3**: Rapidly declining, but common British breeding birds. For these species the JNCC and Country Agencies will, in collaboration with Non-Governmental Organisations, investigate causes of decline and consider their conservation requirements and, where appropriate, prepare Species Action Plans to ensure effective conservation.
- **Table 4**: Species listed as moderately declining, historically declining but common, internationally important, localised or 'threatened in Europe' British breeding birds. These species require monitoring of populations and, where appropriate, the preparation of Species Action Plans to ensure effective conservation.
- **Unlisted**: Other British breeding or non-breeding birds.

Species are also categorised with reference to the *Birds of Conservation Concern* listing (Gibbons *et al.* 1996) as follows:

- **Red**: generally equivalent to Tables 1, 2 & 3 of the JNCC list.
- **Amber**: generally equivalent to Table 4.
- **Green**: generally equivalent to unlisted.

The UK Biodiversity Steering Group produced three lists of species of conservation concern (Anon. 1995) which have since been rationalised to two lists (Anon. 1998). These are indicated as follows:

- **Biodiversity Steering Group Priority Species List:** species which are globally threatened or rapidly declining in the UK (i.e. by at least 50% in the last 25 years); and for which costed Action Plans have been prepared (previously the "short" and "middle" lists).
- **Biodiversity Steering Group Conservation Concern List:** this includes species on the Priority List but also species for which UK has >25% of the world or appropriate biogeographical population; species for which numbers or range have declined between 25 and 49% over the last 25 years; species which are found in <15 10-km squares in the UK; and species listed in international or national conservation legislation.

3) *Species summary*: this provides a brief summary of the trends detailed for the species and indicates why such changes might have occurred with reference to published information when available.

4) *Population trends graph*: this shows the changes in abundance for that species over the past 25 years, as measured by the Common Birds Census or Waterways Bird Survey. Trends are statistically smoothed and 95% confidence limits are shown above and below as thinner lines. In a few cases the lower confidence limit is not visible because its value is zero and coincides with the x-axis.

5) *Population trends table*: this provides details of percentage changes in population size over the past 25 years (or a shorter period, depending on the availability of data). It lists the period of years concerned and any caveats that must be considered when interpreting the changes. Statistical significance is indicated by a "*" (at $P < 0.05$) or non-significance by "n.s.". The caveats are:

- **Small sample:** for CBC & WBS data, a sample of less than 20 census plots was available for at least one of the years, the number of such years is also provided in parentheses and the timing of these years in the series (i.e. early, middle, late or throughout the series); for CES data, a sample of less than 20 plots was available for more than half the years; for BBS data, a sample of only 50-99 plots was available for at least one of the years.
- **Low densities:** the CBC or WBS data may not be representative of the population as a whole because the average abundance of a species in 10-km squares containing CBC or WBS plots was less than that in other 10-km squares of the species' distribution in the UK (as measured from *New Breeding Atlas* data (Gibbons *et al.* 1993)).
- **Unrepresentative?:** it is unknown whether the CBC or WBS data are representative of the UK population because the average abundance of a species in 10-km squares containing CBC or WBS plots and in other 10-km squares of the species' distribution

could not be calculated (as measured from *New Breeding Atlas* data (Gibbons *et al.* 1993)).

6) *Productivity trends table*: this provides details of changes in productivity over the past 25 years (or a shorter period, depending on the availability of data). It lists the period of years concerned and the existence of any caveats that must be considered when interpreting the data. Productivity changes are indicated as positive (+ve) or negative (-ve), or as a combination if changes have been curvilinear (e.g. "+ve to -ve" to indicate that productivity has increased then decreased). Changes are indicated as statistically significant (at $P < 0.05$) by a "***" or non-significant by "n.s.". When significant trends in clutch size, brood size or laying date occur, the absolute values of the changes, as predicted by regression analysis, are also provided. The caveats that may apply are:

- **Small sample**: only 100-250 nest records were available for analysis over the years concerned; for CES, a sample of less than 20 plots was available for more than half the years.
- **Unreliable trend**: although statistically significant, such a trend is probably caused by the undue effect of a small number of outlying data points.

7) *Notable demographic graphs*: notable graphs of changes recorded by the Constant Effort Sites Scheme or Nest Record Scheme illustrate significant trends in population size or productivity.

3.1 RED-THROATED DIVER *Gavia stellata* MEDIUM BTO ALERT

3.1.1 CONSERVATION IMPORTANCE

Table 4/Amber (European status)
Biodiversity Steering Group Conservation
Concern List

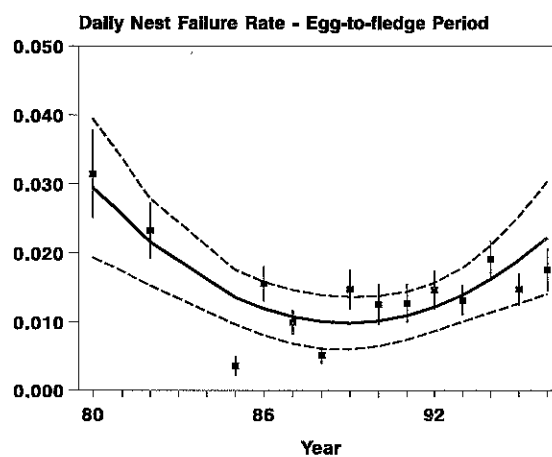
3.1.2 SPECIES SUMMARY

Increasing nest failure rates during the young stage is worrying for this species because of its unfavourable European conservation status. It should be noted that, although many of the nest records come from Orkney, there are reasonable numbers also from Shetland, mainland Scotland and Western Isles. Population Trends are not monitored by the BTO.

Table 3.1.2: Productivity trends

	Years	Change		Caveat
NRS - egg stage nest losses d ⁻¹	1980-96	+ve	n.s.	
NRS - young stage nest losses d ⁻¹	1980-96	+ve	*	
NRS - egg-to-fledge nest losses d ⁻¹	1980-96	-ve to +ve	*	
NRS - clutch size	1980-96	+ve	n.s.	
NRS - brood size	1980-96	+ve	n.s.	

Figure 3.1.2: Long-term trend from the Nest Record Scheme



3.2 LITTLE GREBE *Tachybaptus ruficollis*

3.2.1 CONSERVATION IMPORTANCE

Unlisted/Green

Biodiversity Steering Group: Unlisted

3.2.2 SPECIES SUMMARY

There is little evidence of any population change or distributional change for this widespread species (Gibbons *et al.* 1993). Only small numbers of Little Grebe are monitored by the WBS thus confidence limits of the population trend are wide and the change is not significant.

Figure 3.2.1:
Population trend from the Waterways Bird Survey

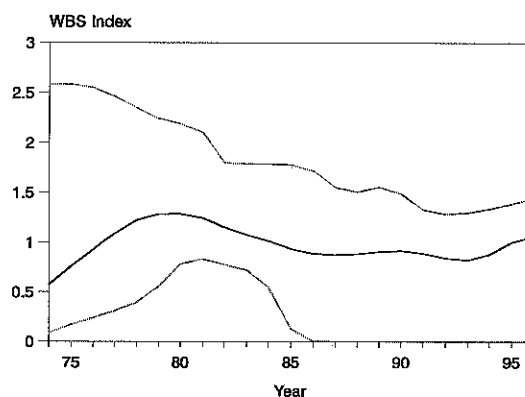


Table 3.2.1: Population trends

	Years	Change %	Caveat
WBS	1974-96	+83	Small Sample (19, throughout)

3.3 GREAT CRESTED GREBE *Podiceps cristatus*

3.3.1 CONSERVATION IMPORTANCE

Unlisted/Green

Biodiversity Steering Group: Unlisted

3.3.2 SPECIES SUMMARY

Currently poorly monitored except by periodic national surveys. Over the long term this population has increased substantially with a decline in persecution (for their plumes) and the creation of new habitat such as flooded gravel pits (Gibbons *et al.* 1993).

Table 3.3.1: Population trends

	Years	Change %	Caveat
BBS	1994-96	-16 n.s.	Small Sample

3.4 GREY HERON *Ardea cinerea*

3.4.1 CONSERVATION IMPORTANCE

Unlisted/Green

Biodiversity Steering Group: Unlisted

3.4.2 SPECIES SUMMARY

The breeding population size of this species has been monitored in England and Wales by the Heronries Census since 1928. It is still near its all-time high attained in 1995. The species has spread into new parts of the UK and may have benefitted from a combination of warmer winters, decreased persecution and less pollution (Gibbons *et al.* 1993).

Figure 3.4.1:
Population trend from the Heronries Census

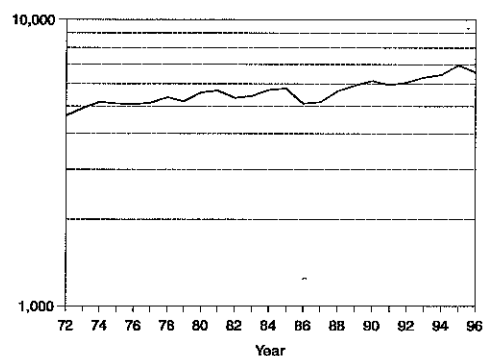


Table 3.4.1: Population trends

	Years	Change %	Caveat
Heronries Census	1972-96	+33	
BBS	1994-96	+10 n.s.	

Table 3.4.2: Productivity trends

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1972-96	+ve n.s.	
NRS - young stage nest losses d ⁻¹	1972-96	+ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	+ve n.s.	
NRS - clutch size	1972-96	-ve n.s.	
NRS - brood size	1972-96	+ve n.s.	Small Sample

3.5 MUTE SWAN *Cygnus olor*

3.5.1 CONSERVATION IMPORTANCE

Unlisted/Green
Biodiversity Steering Group Conservation
Concern List

3.5.2 SPECIES SUMMARY

The population of Mute Swans has shown encouraging increases since the introduction of alternatives to lead weights for angling and a recent run of mild winters (Gibbons *et al.* 1993).

Figure 3.5.1:
Population trend from the Waterways Bird Survey

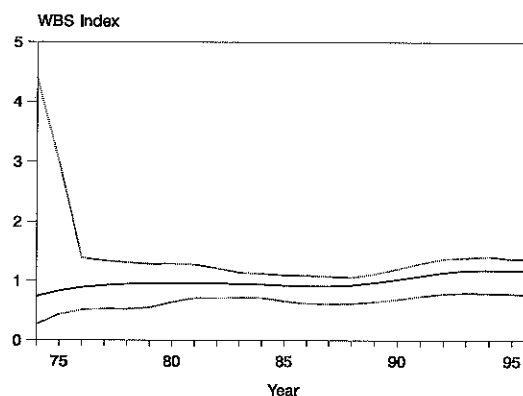


Table 3.5.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	+100	Unrepresentative? & Small Sample (8, early)
WBS	1974-96	+59	Unrepresentative?
BBS	1994-96	-23 *	

Table 3.5.2: Productivity trends

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1972-96	+ve n.s.	
NRS - young stage nest losses d ⁻¹	1972-96	+ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	-ve n.s.	
NRS - clutch size	1972-96	+ve n.s.	
NRS - brood size	1972-96	+ve n.s.	
NRS - laying date	1972-96	+ve n.s.	

3.6 MALLARD *Anas platyrhynchos*

3.6.1 CONSERVATION IMPORTANCE

Unlisted/Green
Biodiversity Steering Group Conservation
Concern List

3.6.2 SPECIES SUMMARY

The population of Mallard has increased considerably over the last 20-25 years, which may be due to large-scale release programmes by wildfowlers (Marchant *et al.* 1990).

Figure 3.6.1:
Population trend from the Waterways Bird Survey

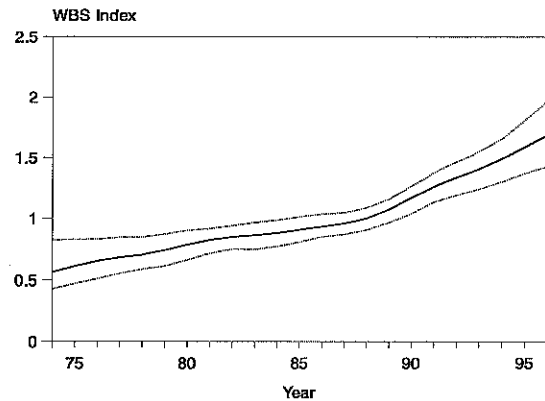


Table 3.6.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	+29	
CBC - Farmland	1972-96	+65	
WBS	1974-96	+199	
BBS	1994-96	-1 n.s.	

3.7 TUFTED DUCK *Aythya fuligula*

3.7.1 CONSERVATION IMPORTANCE

Unlisted/Green
Biodiversity Steering Group Conservation
Concern List

3.7.2 SPECIES SUMMARY

Tufted Duck is widespread and has shown little overall change in size over the past 25 years. It is thought that the spread of the zebra mussel has helped this species in the recent past (Gibbons *et al.* 1993).

Figure 3.7.1:
Population trend from the Waterways Bird Survey

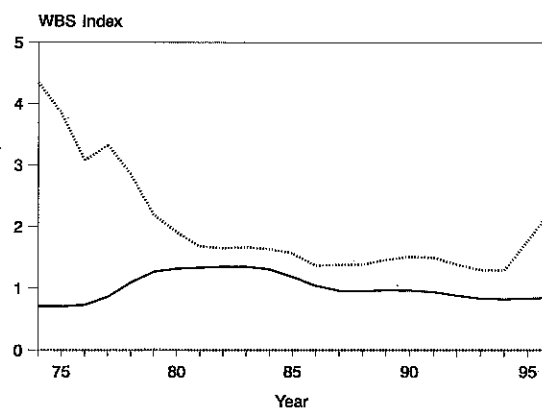


Table 3.7.1: Population trends

	Years	Change %	Caveat
WBS	1974-96	+20	Unrepresentative?
BBS	1994-96	+3 n.s.	

3.8 HEN HARRIER *Circus cyaneus*

3.8.1 CONSERVATION IMPORTANCE

Table 2/Red (Historical decline)
**Biodiversity Steering Group Conservation
 Concern List**

3.8.2 SPECIES SUMMARY

Listed because of substantial declines over the last 200 years, this species has suffered from persecution on grouse moors (Etheridge *et al.* 1997) and more recently from loss of habitat as forestry plantations have matured (Bibby & Etheridge 1993). A High BTO Alert was issued in 1997 because average clutch size had declined substantially since the mid 1980s, but further investigation has shown that this trend was due to increased proportions of records from Orkney in recent years, where clutch sizes tend to be smaller than on the mainland (Summers in press, Crick in press).

Table 3.8.2: Productivity trends

	Years	Change		Caveat
NRS - egg stage nest losses d ⁻¹	1978-96	+ve	n.s.	Unreliable Trend
NRS - young stage nest losses d ⁻¹	1978-96	+ve	n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1978-96	+ve	n.s.	
NRS - clutch size	1972-96	(5.11 - 4.36	*)	
NRS - brood size	1972-96	-ve	n.s.	

3.9 SPARROWHAWK *Accipiter nisus*

3.9.1 CONSERVATION IMPORTANCE

Unlisted/Green
Biodiversity Steering Group Conservation
Concern List

3.9.2 SPECIES SUMMARY

The population showed a steady recovery since the declines caused by organochlorine pesticides in the 1950s and 1960s (Newton 1986) until the last 2-3 years, when populations have fallen. Data from intensive studies support this evidence of recent decline (Newton pers. comm. in BTO *et al.* 1997) Significant improvements in reproductive performance over the last 25 years are likely to have been a contributory factor to the population increase.

Figure 3.9.1
Population trend from the Common Birds Census

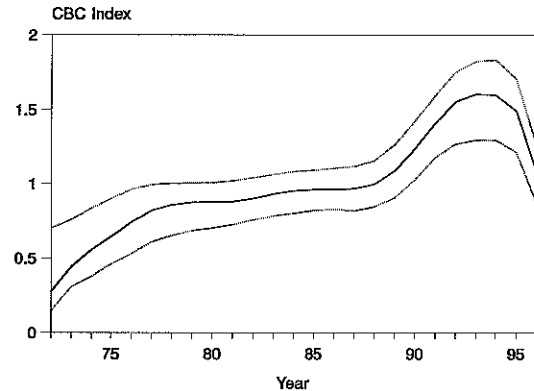


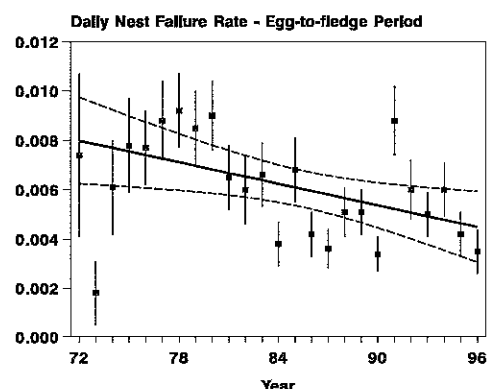
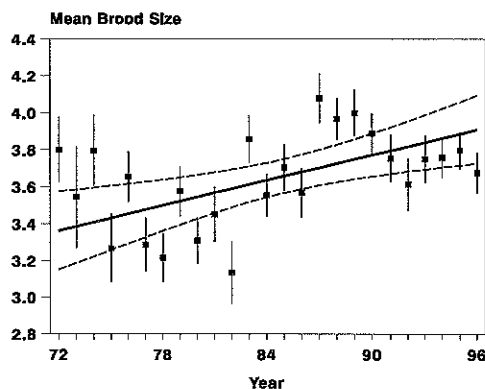
Table 3.9.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	+294	Unrepresentative? & Small Sample (2, early)
BBS	1994-96	-27*	

Table 3.9.2: Productivity trends

	Years	Change		Caveat
NRS - egg stage nest losses d ⁻¹	1972-96	-ve	n.s.	
NRS - young stage nest losses d ⁻¹	1972-96	+ve	n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	-ve	*	
NRS - clutch size	1972-96	-ve	n.s.	
NRS - brood size	1972-96	3.36 - 3.90	*	
NRS - laying date	1972-96	-ve	n.s.	

Figure 3.9.2: Long-term trends from the Nest Record Scheme



3.10 BUZZARD *Buteo buteo*

3.10.1 CONSERVATION IMPORTANCE

Unlisted/Green
Biodiversity Steering Group Conservation
Concern List

3.10.2 SPECIES SUMMARY

The Buzzard population has been spreading eastwards gradually from its former restricted western distribution, a consequence of earlier persecution (Elliott and Avery 1991). However, the population increase is still not sufficient to be apparent in the eastern-biased CBC dataset. The population spread is linked to decreased persecution, recovering rabbit populations after their suppression by myxomatosis, and the restriction in use of organochlorine pesticides, all of which may have helped to improve nesting success.

Figure 3.10.1:
Population trend from the Common Birds Census

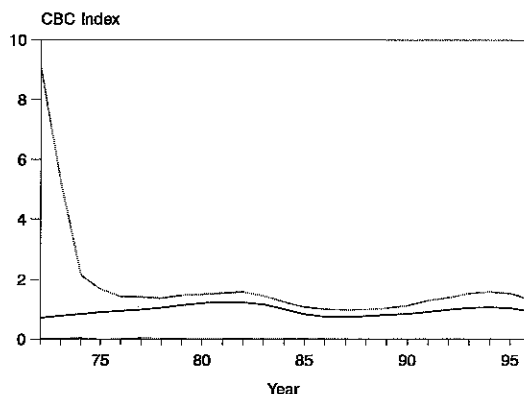


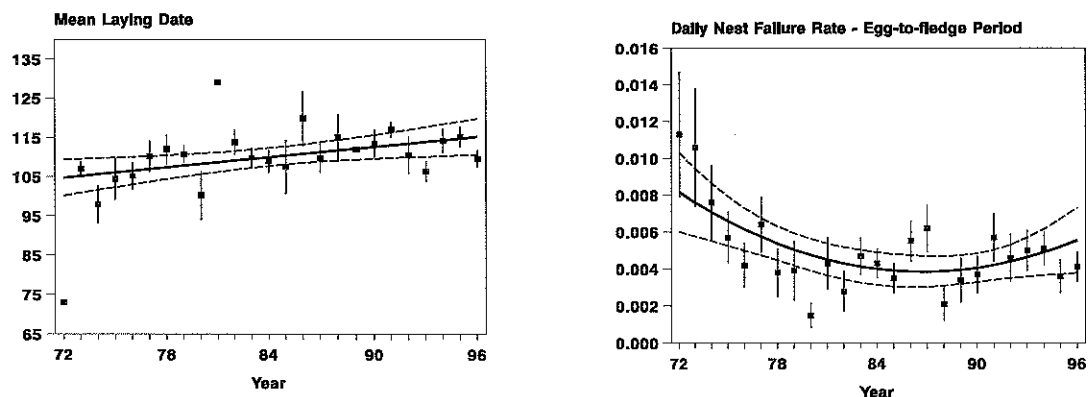
Table 3.10.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	+29	Unrepresentative? & Small Sample (9, early)
BBS	1994-96	+14*	

Table 3.10.2: Productivity trends

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1972-96	-ve n.s.	Small Sample
NRS - young stage nest losses d ⁻¹	1972-96	-ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	-ve to +ve*	
NRS - clutch size	1972-96	+ve n.s.	
NRS - brood size	1972-96	+ve n.s.	
NRS - laying date	1972-96	105 - 115*	

Figure 3.10.2: Long-term trends from the Nest Record Scheme



3.11 KESTREL *Falco tinnunculus*

3.11.1 CONSERVATION IMPORTANCE

Table 4/Amber (25-50% Population decline)
Biodiversity Steering Group Conservation
Concern List

3.11.2 SPECIES SUMMARY

The reasons for the Kestrel's population decline are unknown, but may be linked to farmland habitat degradation and declines in its small mammal prey populations as a result of agricultural intensification (Gibbons *et al.* 1993). Improvements in breeding performance are likely to be the result of the declining impact of organochlorine pesticides.

Figure 3.11.1:
Population trend from the Common Birds Census

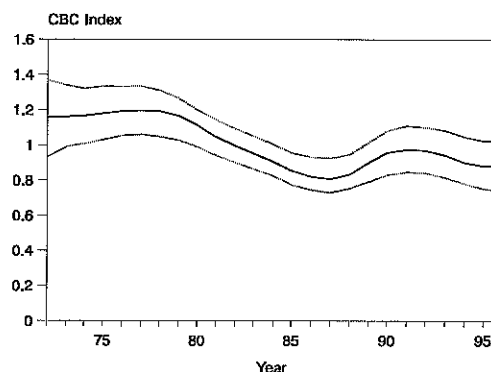


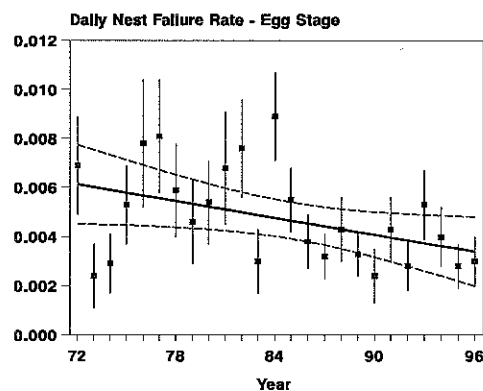
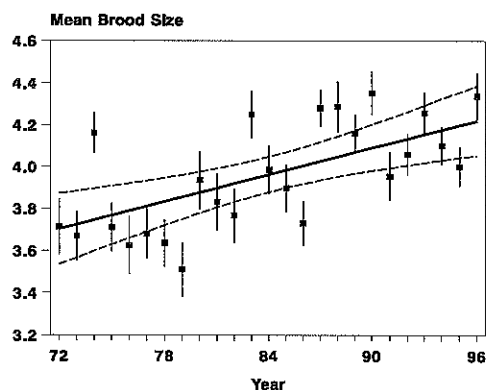
Table 3.11.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	-24	
BBS	1994-96	-20 *	

Table 3.11.2: Productivity trends

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1972-96	-ve *	
NRS - young stage nest losses d ⁻¹	1972-96	-ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	-ve *	
NRS - clutch size	1972-96	+ve n.s.	
NRS - brood size	1972-96	3.70 - 4.21 *	
NRS - laying date	1972-96	-ve n.s.	

Figure 3.11.2: Long-term trends from the Nest Record Scheme



3.12 MERLIN *Falco columbarius*

3.12.1 CONSERVATION IMPORTANCE

Table 2/Red (Historical decline)
Biodiversity Steering Group Conservation
Concern List

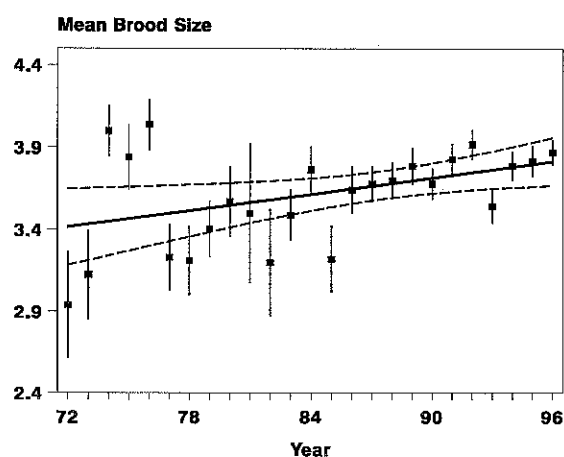
3.12.2 SPECIES SUMMARY

Having declined substantially over the past two centuries, there are indications that it has increased recently, perhaps associated with an increased use of forest edge as a nesting habitat (Parr 1994). Breeding performance has improved since the 1960s, probably linked to the declining influence of organochlorine pesticides (Crick 1993). Population trends are not monitored by the BTO.

Table 3.12.2: Productivity trends

	Years	Change		Caveat
NRS - egg stage nest losses d ⁻¹	1972-96	-ve	n.s.	Small Sample
NRS - young stage nest losses d ⁻¹	1972-96	-ve	n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	-ve	n.s.	
NRS - clutch size	1972-96	+ve	n.s.	
NRS - brood size	1972-96	3.41 - 3.81	*	
NRS - laying date	1972-96	-ve	n.s.	

Figure 3.12.2: Long-term trend from the Nest Record Scheme



3.13 HOBBY *Falco subbuteo*

3.13.1 CONSERVATION IMPORTANCE

Unlisted/Green

Biodiversity Steering Group Conservation
Concern List

3.13.2 SPECIES SUMMARY

This species is poorly monitored by standard BTO monitoring schemes due to its low population density and unobtrusive habits. Its distribution has increased markedly northwards in England since the 1970s (Gibbons *et al.* 1993), perhaps linked to increases in its dragonfly prey supplies (Prince & Clarke 1995) and a decreasing dependency on its traditional heathland habitat. Productivity appears not to have changed substantially over the last 25 years.

Table 3.13.2: Productivity trends (NRS Data for 1996 unavailable, thus trends are for 1971-95)

	Years	Change		Caveat
NRS - egg stage nest losses d ⁻¹	1971-95	+ve	n.s.	Small Sample
NRS - young stage nest losses d ⁻¹	1971-95	+ve	n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1971-95	-ve	n.s.	
NRS - clutch size	1971-95	+ve	n.s.	Small Sample
NRS - brood size	1971-95	+ve	n.s.	

3.14 PEREGRINE FALCON *Falco peregrinus*

3.14.1 CONSERVATION IMPORTANCE

Table 4/Amber (European status)
Biodiversity Steering Group Conservation
Concern List

3.14.2 SPECIES SUMMARY

Although Peregrine has an unfavourable conservation status in Europe, its population size and distribution in the UK have largely recovered from the detrimental effects of organochlorine pesticides in the 1950s and 1960s; however, populations have declined recently in north-west Scotland and the Northern Isles (Crick & Ratcliffe 1995). The breeding performance of this species appears to have fully recovered but declined in the latter areas. Populations size of breeding pairs has been censused every 10 years by BTO/JNCC/RSPB/Raptor Study Groups since 1961. Surveys: 1961:385 pairs; 1971:489 pairs; 1981:728 pairs; 1991: 1283 pairs (Ratcliffe 1996).

Table 3.14.2: Productivity trends

	Years	Change %		Caveat
NRS - egg stage nest losses d ⁻¹	1978-96	+ve	n.s.	Small Sample
NRS - young stage nest losses d ⁻¹	1978-96	-ve	n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1978-96	-ve	n.s.	
NRS - clutch size	1972-96	-ve	n.s.	
NRS - brood size	1972-96	+ve	n.s.	
NRS - laying date	1972-96	+ve	n.s.	

3.15 RED GROUSE *Lagopus lagopus*

3.15.1 CONSERVATION IMPORTANCE

Unlisted/Green

Biodiversity Steering Group: Unlisted

3.15.2 SPECIES SUMMARY

This species has been poorly covered by BTO surveys in the past, but surveys by the Game Conservancy Trust have shown long-term declines that appear to be due to degradation and loss of moorland habitat and increased predation by corvids and foxes (Hudson 1992). The recent intensive Joint Raptor Study suggests that breeding populations are unaffected by raptor predation, but that raptors can reduce post-breeding populations under certain conditions (Redpath and Thirgood 1997)

Table 3.15.1: Population trends

	Years	Change %	Caveat
BBS	1994-96	-3 n.s.	

3.16 RED-LEGGED PARTRIDGE *Alectoris rufa*

3.16.1 CONSERVATION IMPORTANCE

Unlisted/Green

Biodiversity Steering Group: Unlisted

3.16.2 SPECIES SUMMARY

This species was introduced in the 18th century and has a distribution restricted mainly to England, although there has been some spread northwards and westwards (Gibbons *et al.* 1993). The population is maintained by releases for game shooting and the decline in the CBC index may be linked to declining farmland habitat quality but is more likely to be due to the cessation of releasing Chukars *A. chukar*, a similar-looking "confusion species" that resulted in Red-legged x Chukar hybrids. This is why no BTO Alert is issued for the species.

Figure 3.16.1:
Population trend from the Common Birds Census

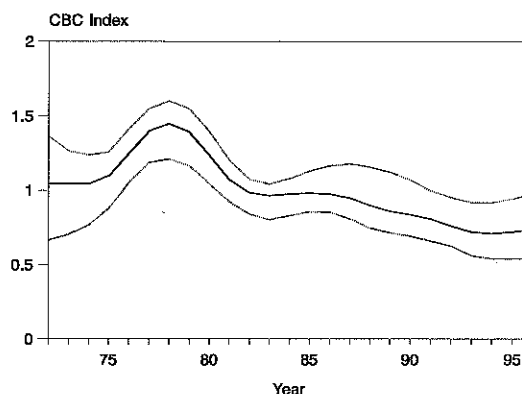


Table 3.16.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	-30	Small Sample (1, early)
CBC - Farmland	1972-96	-32	
BBS	1994-96	+32 *	

3.17 GREY PARTRIDGE *Perdix perdix* HIGH BTO ALERT

3.17.1 CONSERVATION IMPORTANCE

Table 3/Red (50% Population decline)
Biodiversity Steering Group Priority Species List

3.17.2 SPECIES SUMMARY

This is a species of considerable conservation importance because of its massive population decline, requiring a High BTO Alert, which shows no sign of recovery. The cause of the decline is linked strongly to low chick survival rates as a result of herbicidal destruction of the food plants of the insect prey of chicks (Potts 1986, Campbell *et al.* 1997).

Figure 3.17.1:
Population trend from the Common Birds Census

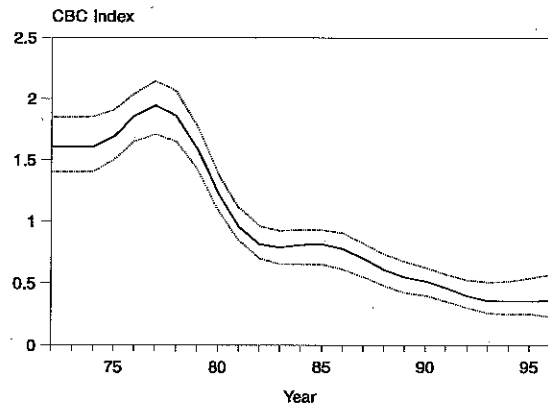


Table 3.17.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	-78	
BBS	1994-96	+22 *	

3.18 PHEASANT *Phasianus colchicus*

3.18.1 CONSERVATION IMPORTANCE

Unlisted/Green

Biodiversity Steering Group: Unlisted

3.18.2 SPECIES SUMMARY

The populations of this gamebird have increased, but population levels are mainly related to the release of captive-bred stock by game-shooting interests (Marchant *et al.* 1990).

Figure 3.18.1:
Population trend from the Common Birds Census

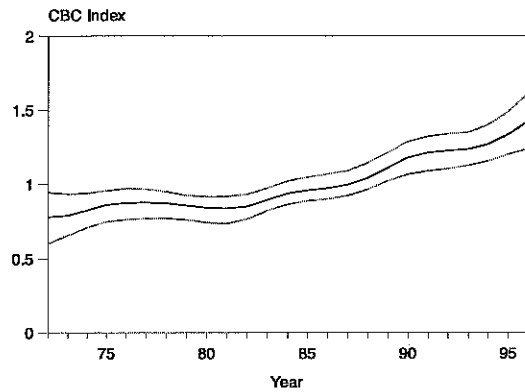


Table 3.18.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	+83	
CBC - Farmland	1972-96	+102	
CBC - Woodland	1972-96	+125	
BBS	1994-96	+9*	

3.19 MOORHEN *Gallinula chloropus* MEDIUM BTO ALERT

3.19.1 CONSERVATION IMPORTANCE

Unlisted/Green

Biodiversity Steering Group: Unlisted

3.19.2 SPECIES SUMMARY

While populations on WBS plots have remained relatively stable, declines on CBC plots may indicate a decline in habitat suitability away from waterways (Marchant *et al.* 1990). Distributional contractions have occurred in Scotland, Wales and the south-west England (Gibbons *et al.* 1993). Significant declines in productivity have warranted the inclusion of this species of Medium BTO Alerts.

Figure 3.19.1:
Population trend from the Waterways Bird Survey

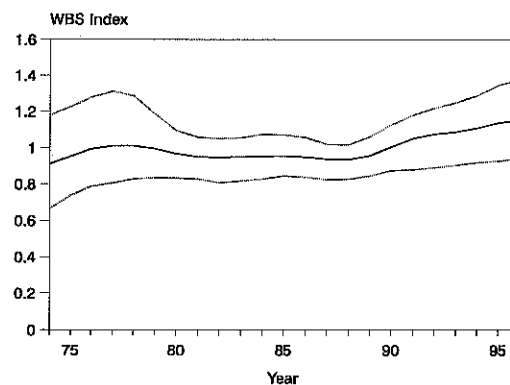


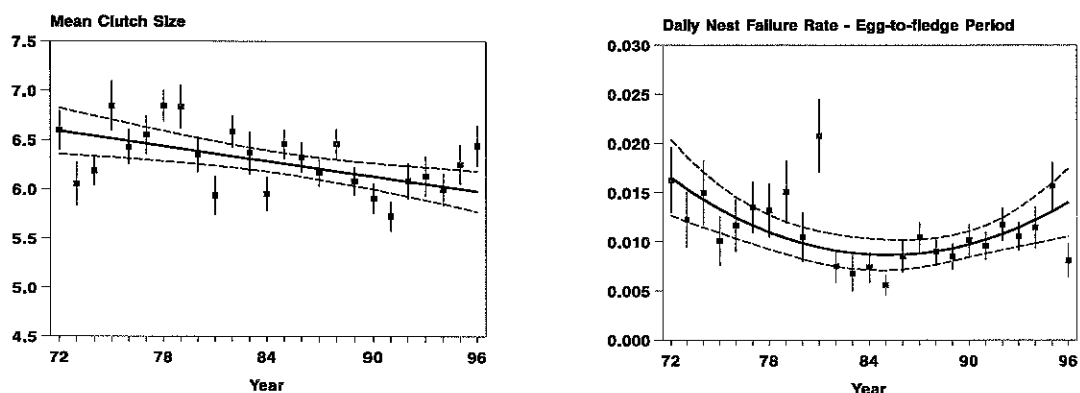
Table 3.19.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	-10	
CBC - Farmland	1972-96	-18	
WBS	1974-96	+27	
BBS	1994-96	+5 n.s.	

Table 3.19.2: Productivity trends

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1972-96	-ve to +ve *	
NRS - young stage nest losses d ⁻¹	1972-96	+ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	-ve to +ve *	
NRS - clutch size	1972-96	6.59 - 5.97 *	
NRS - brood size	1972-96	3.20 - 3.98 *	
NRS - laying date	1972-96	-ve n.s.	

Figure 3.19.2: Long-term trends from the Nest Record Scheme



3.20 COOT *Fulica atra*

3.20.1 CONSERVATION IMPORTANCE

Unlisted/Green

Biodiversity Steering Group: Unlisted

3.20.2 SPECIES SUMMARY

It is uncertain why Coot number have increased on WBS plots, although it could reflect a population overflow from standing water bodies (Marchant *et al.* 1990).

Figure 3.20.1:
Population trend from the Waterways Bird Survey

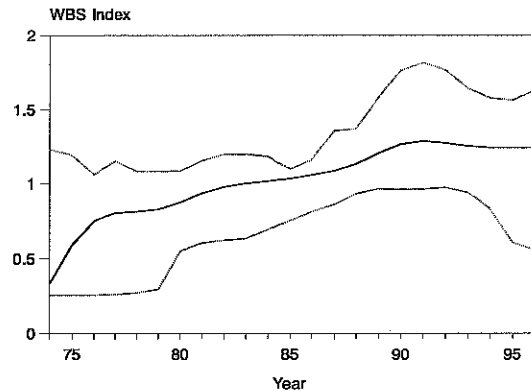


Table 3.20.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	-22	Unrepresentative?
WBS	1974-96	+274	Unrepresentative? & Small Sample (2, early)
BBS	1994-96	+27 *	

3.21 OYSTERCATCHER *Haematopus ostralegus*

3.21.1 CONSERVATION IMPORTANCE

Table 4/Amber (Wintering population)
Biodiversity Steering Group: Unlisted

3.21.2 SPECIES SUMMARY

Although there is insufficient data to calculate WBS population index, it is likely that waterways populations have increased as Oystercatchers colonised inland areas in England and Wales (Gibbons *et al.* 1993). The trend towards earlier average laying dates may be linked to this habitat shift or to climate change (Crick *et al.* 1997).

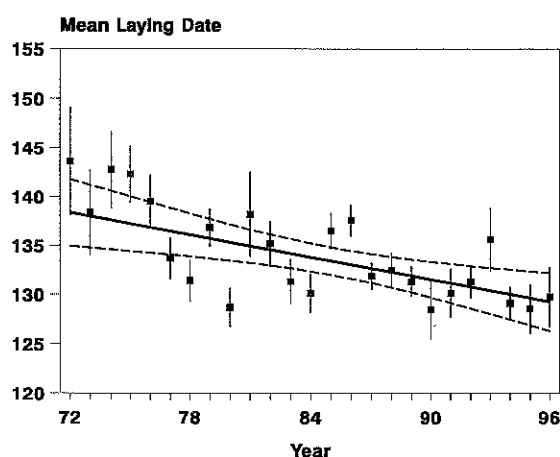
Table 3.21.1: Population trends

	Years	Change %	Caveat
BBS	1994-96	-32 *	

Table 3.21.2: Productivity trends

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1972-96	+ve n.s.	
NRS - clutch size	1972-96	+ve n.s.	
NRS - laying date	1972-96	138 - 129 *	

Figure 3.21.2: Long-term trend from the Nest Record Scheme



3.22 RINGED PLOVER *Charadrius hiaticula*

3.22.1 CONSERVATION IMPORTANCE

Table 4/Amber (Wintering population)
Biodiversity Steering Group Conservation
Concern List

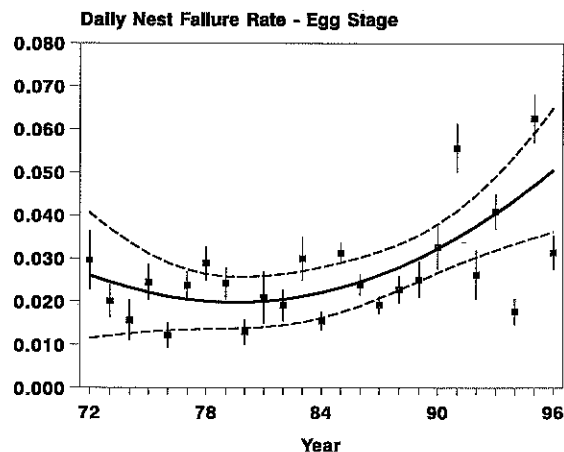
3.22.2 SPECIES SUMMARY

Although the breeding population is not monitored annually by the BTO; its distribution has spread inland, especially in England, probably associated with the increase in number of gravel pits and reservoirs (Gibbons *et al.* 1993). Although there is a trend towards increasing nest failures, it is likely that this is due mainly to two potentially poor year's (1991 and 1995) and, thus, does not warrant an alert.

Table 3.22.2: Productivity trends

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1972-96	-ve to +ve *	
NRS - clutch size	1972-96	+ve n.s.	
NRS - laying date	1972-96	-ve n.s.	

Figure 3.22.2: Long-term trend from the Nest Record Scheme



3.23 GOLDEN PLOVER *Pluvialis apricaria*

3.23.1 CONSERVATION IMPORTANCE

Table 4/Amber (Wintering population)
Biodiversity Steering Group Conservation
Concern List

3.23.2 SPECIES SUMMARY

Generally thought to be declining (Gibbons *et al.* 1993), this species has been relatively poorly monitored, although BBS should provide better coverage in the future. The large decline between 1994 and 1996 may have been influenced by the recording of non-breeding flocks close to the breeding grounds (Gregory *et al.* 1996). Detailed analysis of nest record cards suggests the occurrence of a decline in nest survival on grass moors compared to heather moors, which might be linked to increased sheep stocking rates (Crick 1992a, Fuller 1996).

Table 3.23.1: Population trends

	Years	Change %	Caveat
BBS	1994-96	-59 *	

Table 3.23.2: Productivity trends (NRS Data for 1996 unavailable, thus trends are for 1971-1995)

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1971-95	-ve n.s.	Small Sample
NRS - clutch size	1971-95	+ve n.s.	
NRS - laying date	1971-95	-ve n.s.	

3.24 LAPWING *Vanellus vanellus* MEDIUM BTO ALERT

3.24.1 CONSERVATION IMPORTANCE

Table 4/Amber (Wintering population)
Biodiversity Steering Group Conservation
Concern List

3.24.2 SPECIES SUMMARY

The population declined substantially on CBC plots through the 1980s, requiring a Medium BTO Alert although the highest densities occur in the north of England and Scotland, in the area less well covered by CBC. The declines are strongly linked to changes in agricultural practice (Hudson *et al.* 1994) and may be due to declines in productivity (nestling survival rates) because adult and first year survival rates show no trend through time (Peach *et al.* 1994).

Figure 3.24.1:
Population trend from the Common Birds Census

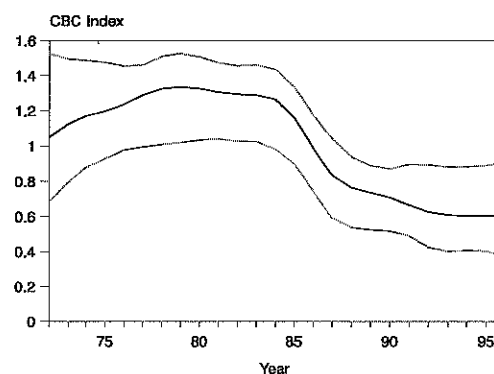


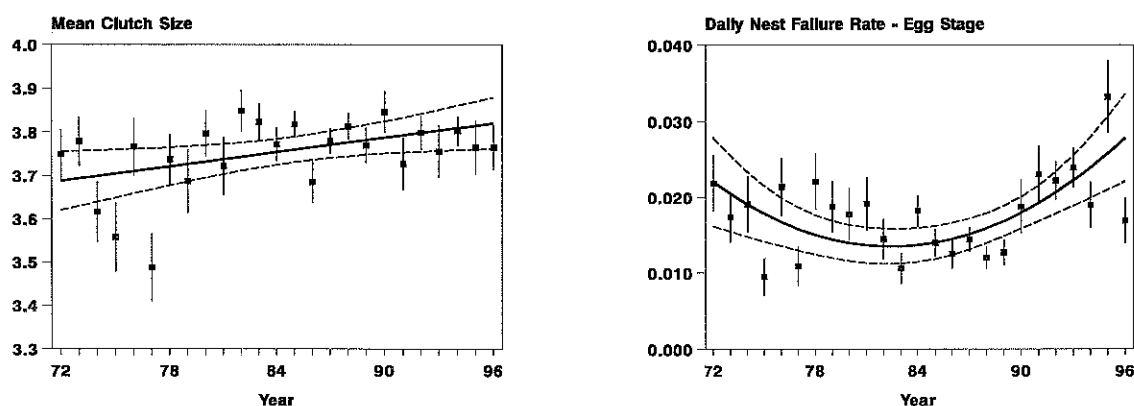
Table 3.24.1: Population trends

	Years	Change %	Caveat
CBC - Farmland	1972-96	-46	Low Densities
CBC - all	1972-96	-42	
BBS	1994-96	-4 n.s.	

Table 3.24.2: Productivity trends

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1972-96	-ve to +ve *	
NRS - clutch size	1972-96	3.68 - 3.82 *	
NRS - laying date	1972-96	-ve n.s.	

Figure 3.24.2: Long-term trends from the Nest Record Scheme



3.25 SNIPE *Gallinago gallinago*

HIGH BTO ALERT

3.25.1 CONSERVATION IMPORTANCE

Unlisted/Amber (25-50% Population decline)
Biodiversity Steering Group Conservation
Concern List

3.25.2 SPECIES SUMMARY

Due to its secretive and cryptic nature this species is relatively poorly monitored but the CBC shows a severe decline over the past 25 years, which almost makes it impossible to be indexed in recent years. Its distribution has contracted substantially with the drainage and intensification of grassland management (Gibbons *et al.* 1993).

Figure 3.25.1
Population trend from the Common Birds Census

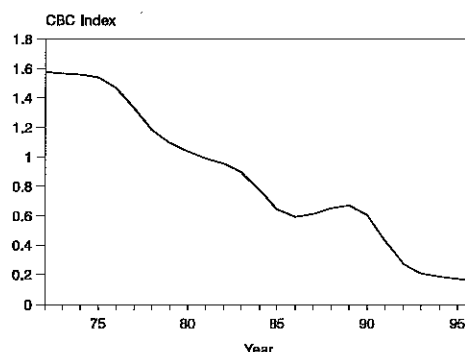


Table 3.25.1: Population trends (NRS Data for 1996 unavailable, thus trends are for 1971-1995)

	Years	Change %	Caveat
CBC-all	1972-96	-90	Small Sample (14, late)
BBS	1994-96	-9 n.s.	

Table 3.25.2: Productivity trends

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1971-95	-ve n.s.	Small Sample
NRS - clutch size	1971-95	-ve n.s.	

3.26 WOODCOCK *Scolopax rusticola* HIGH BTO ALERT

3.26.1 CONSERVATION IMPORTANCE

Table 4/Amber (25-50% Population decline)
Biodiversity Steering Group Conservation
Concern List

3.26.2 SPECIES SUMMARY

This crepuscular and natural species has undergone a substantial range contraction which is reflected in the population decline in the CBC index, requiring a High BTO Alert. Reasons for this decline are uncertain but may include loss of habitat from forest maturation and lower spring rainfall (Gibbons *et al.* 1993).

Figure 3.26.1:
Population trend from the Common Birds Census

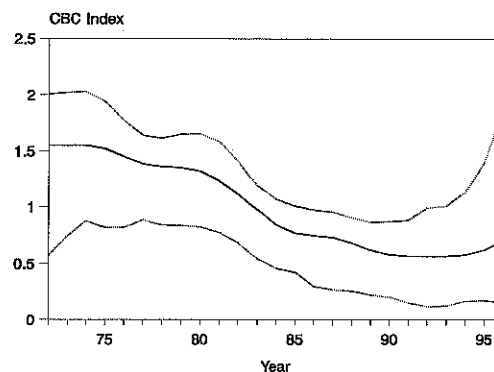


Table 3.26.1: Population trends

	Years	Change	Caveat
CBC - all	1972-96	-55	Unrepresentative? & Small Sample (7, late)

3.27 CURLEW *Numenius arquata* MEDIUM BTO ALERT

3.27.1 CONSERVATION IMPORTANCE

Table 4/Amber (>20% of European population)
Biodiversity Steering Group Conservation
Concern List

3.27.2 SPECIES SUMMARY

The Curlew's population range has contracted in the Midlands and south-west England, which contains many of the CBC plots, probably due to land drainage and agricultural intensification (Gibbons *et al.* 1993). The population decline on CBC plots requires a Medium BTO Alert. The trend towards earlier average laying dates may be linked to climate change (Crick *et al.* 1997).

Figure 3.27.1:
Population trend from the Common Birds Census

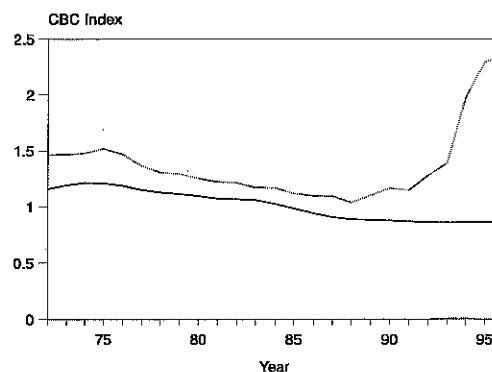


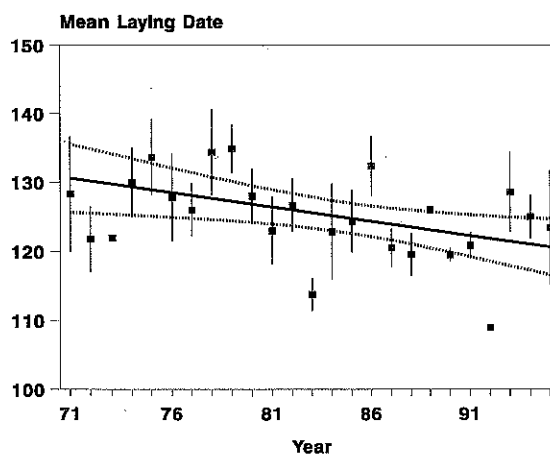
Table 3.27.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	-26	Unrepresentative? & Small Sample (6, throughout)
BBS	1994-96	+1 n.s.	

Table 3.27.2: Productivity trends (NRS Data for 1996 unavailable, thus trends are for 1971-1995)

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1971-95	-ve n.s.	
NRS - clutch size	1971-95	+ve n.s.	
NRS - laying date	1971-95	131-121 *	

Figure 3.27.2: Long-term trend from the Nest Record Scheme



3.28.1 CONSERVATION IMPORTANCE

Table 4/Amber (European status)
Biodiversity Steering Group Conservation
Concern List

3.28.2 SPECIES SUMMARY

Redshank has suffered a substantial range contraction in all parts of the UK, probably due to loss of wetlands to drainage and agricultural intensification (Gibbons *et al.* 1993). The decline in CBC index warrants a High BTO Alert and sample sizes from WBS are too small to allow the production of an index. The reasons for declining egg stage losses are unclear, but the trend towards earlier average laying dates may be linked to climate change (Crick *et al.* 1997).

Figure 3.28.1:
Population trend from the Common Birds Census

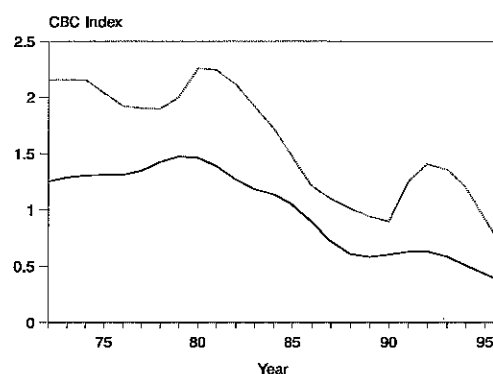


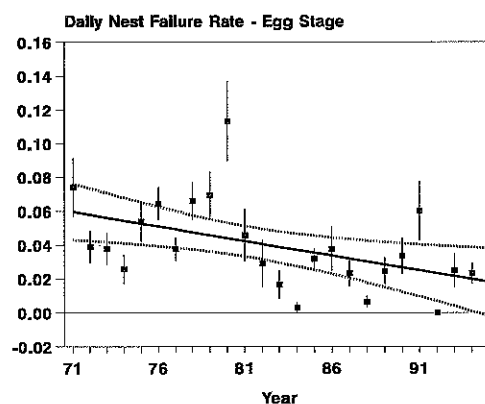
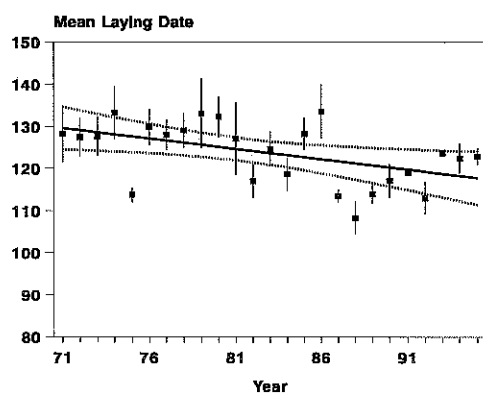
Table 3.28.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	-72	Unrepresentative & Small Sample (14, late)
BBS	1994-96	-33*	

Table 3.28.2: Productivity trends (NRS Data for 1996 unavailable, thus trends are for 1971-1995)

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1971-95	-ve *	
NRS - clutch size	1971-95	+ve n.s.	
NRS - laying date	1971-95	130 - 118 *	Small Sample

Figure 3.28.2: Long-term trends from the Nest Record Scheme



3.29 COMMON SANDPIPER *Actitis hypoleucos*

3.29.1 CONSERVATION IMPORTANCE

Unlisted/Green

Biodiversity Steering Group: Unlisted

3.29.2 SPECIES SUMMARY

Although there is some evidence for a slight range contraction at the southern edges of its distribution in England and Wales (Gibbons *et al.* 1993), its population trend has remained fairly stable.

Figure 3.29.1:
Population trend from the Waterways Bird Survey

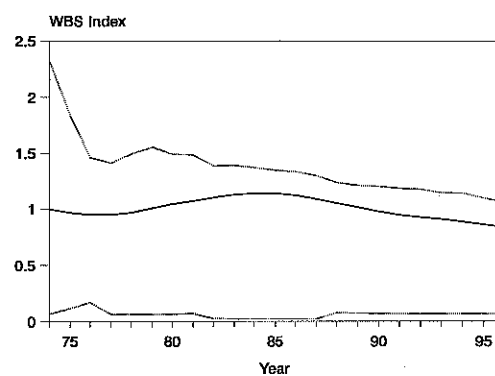


Table 3.29.1: Population trends

	Years	Change %	Caveat
WBS	1974-96	-16	Small Sample (2, early)
BBS	1994-96	+8 n.s.	Small Sample

3.30 FERAL PIGEON/ROCK DOVE *Columba livia*

3.30.1 CONSERVATION IMPORTANCE

Unlisted/Green

Biodiversity Steering Group: Unlisted

3.30.2 SPECIES SUMMARY

The BBS will provide the first monitoring programme for this economically important species. It may be useful in future to try and separate survey squares which cover mainly wild Rock Doves from those that cover feral and domestic pigeons.

Table 3.30.1: Population trends

	Years	Change %	Caveat
BBS	1994-96	-13 *	

3.31 STOCK DOVE *Columba oenas*

3.31.1 CONSERVATION IMPORTANCE

Unlisted/Green

Biodiversity Steering Group: Unlisted

3.31.2 SPECIES SUMMARY

Populations have increased substantially, mainly during the 1970s, probably as a result of recovery from the effects of organochlorine seed-dressings in the 1950s and 1960s (Gibbons *et al.* 1993). The improvements in nest success may also be linked to this. This is one of the few species which has a trend towards later average laying dates (Crick *et al.* 1997).

Figure 3.31.1:
Population trend from the Common Birds Census

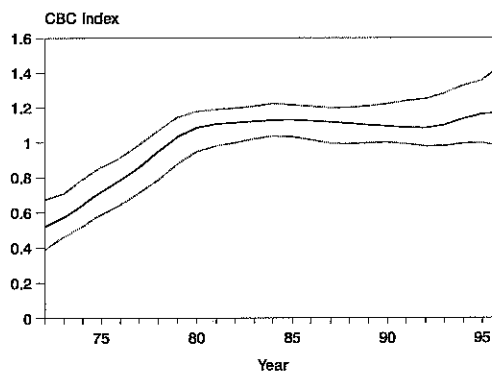


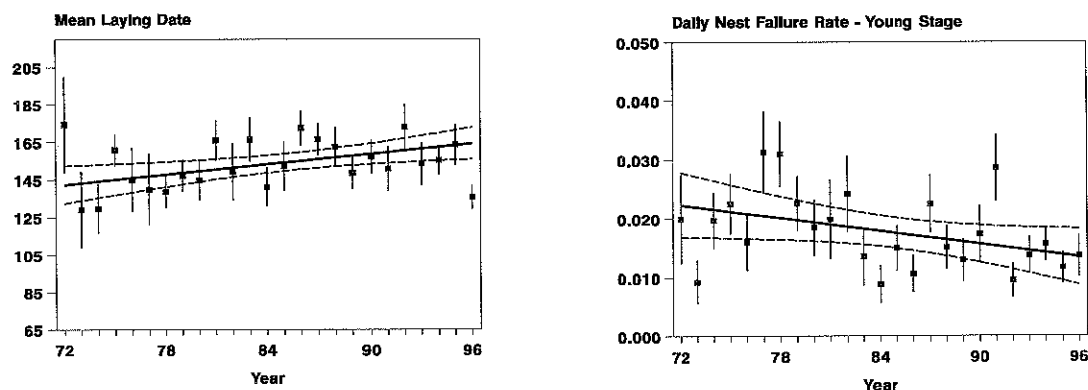
Table 3.31.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	+124	
CBC - Farmland	1972-96	+185	
BBS	1994-96	+14*	

Table 3.31.2: Productivity trends

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1972-96	-ve n.s.	
NRS - young stage nest losses d ⁻¹	1972-96	-ve *	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	-ve *	
NRS - clutch size	1972-96	+ve n.s.	
NRS - brood size	1972-96	1.81 - 1.89 *	
NRS - laying date	1972-96	142 - 164 *	

Figure 3.31.2: Long-term trends from the Nest Record Scheme



3.32 WOODPIGEON *Columba palumbus*

3.32.1 CONSERVATION IMPORTANCE

Unlisted/Green

Biodiversity Steering Group: Unlisted

3.32.2 SPECIES SUMMARY

Woodpigeon is often too abundant on CBC plots and territories too difficult to define to allow accurate assessment of numbers. However, this species has shown a clear population increase and appears to have benefitted from the spread of oilseed rape cultivation (Gibbons *et al.* 1993).

Figure 3.32.1:
Population trend from the Common Birds Census

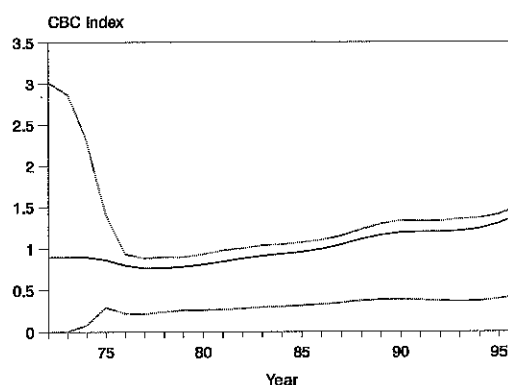


Table 3.32.1: Population trends

	Years	Change %	Caveat
CBC-all	1972-96	+55	Small Sample (4, early)
BBS	1994-96	-8 *	

3.33 COLLARED DOVE *Streptopelia decaocto*

3.33.1 CONSERVATION IMPORTANCE

Unlisted/Green

Biodiversity Steering Group: Unlisted

3.33.2 SPECIES SUMMARY

The population increase after colonisation in the 1950s only started to level out in the late 1970s (Marchant *et al.* 1990). Nesting success has tended to increase over the past 25 years.

Figure 3.33.1:
Population trend from the Common Birds Census

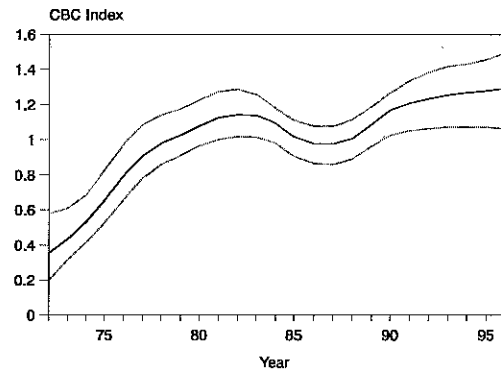


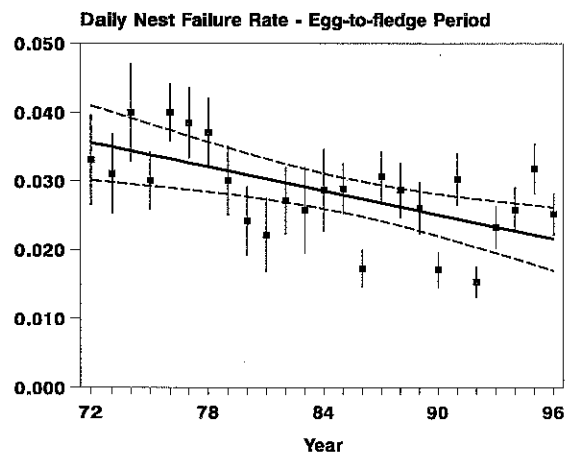
Table 3.33.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	+514	
CBC - Farmland	1972-96	+474	
BBS	1994-96	+11*	

Table 3.33.2: Productivity trends

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1972-96	(-ve to +ve*)	Unreliable trend
NRS - young stage nest losses d ⁻¹	1972-96	-ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	-ve *	
NRS - clutch size	1972-96	-ve n.s.	
NRS - brood size	1972-96	+ve n.s.	
NRS - laying date	1972-96	+ve n.s.	

Figure 3.33.2: Long-term trend from the Nest Record Scheme



3.34 TURTLE DOVE *Streptopelia turtur* HIGH BTO ALERT

3.34.1 CONSERVATION IMPORTANCE

Table 2/Red (>50% Population decline)
Biodiversity Steering Group Priority Species List

3.34.2 SPECIES SUMMARY

Severe population declines, requiring a High BTO Alert, and range contraction to the north and west is the subject of current research (Calladine *et al.* 1997) but may be linked to hunting during migration, reductions in seed availability due to herbicide use and grassland fertilization (Gibbons *et al.* 1993). Non-significant improvements in nest success suggest that productivity per nest may not be a problem.

Figure 3.34.1:
Population trend from the Common Birds Census

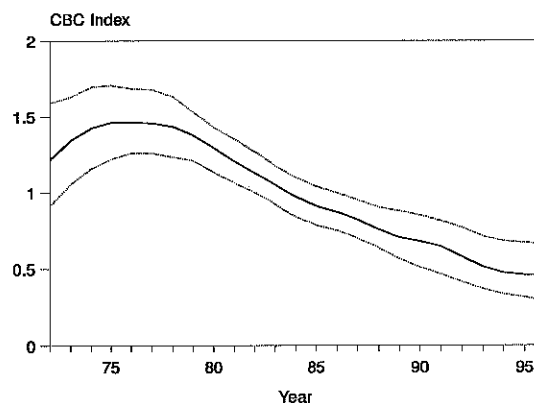


Table 3.34.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	-62	Small Sample (2, late)
CBC - Farmland	1972-96	-85	
CBC - Woodland	1972-96	-53	
BBS	1994-96	+3 n.s.	

Table 3.34.2: Productivity trends (NRS Data for 1996 unavailable, thus trends are for 1971-1995)

	Years	Change		Caveat
NRS - egg stage nest losses d ⁻¹	1971-95	-ve	n.s.	
NRS - young stage nest losses d ⁻¹	1971-95	-ve	n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1971-95	-ve	n.s.	
NRS - clutch size	1971-95	-ve	n.s.	
NRS - brood size	1971-95	-ve	n.s.	
NRS - laying date	1971-95	-ve	n.s.	

3.35 CUCKOO *Cuculus canorus*

3.35.1 CONSERVATION IMPORTANCE

Unlisted/Green

Biodiversity Steering Group: Unlisted

3.35.2 SPECIES SUMMARY

Populations of Cuckoo appear to have been fairly stable over the past 25 years, although there is some doubt as to whether the CBC adequately monitors the species because of its large territory size and its utilisation of woodland and wetland habitats not covered by the CBC (Marchant *et al.* 1990). Although there is little evidence for distributional change (Gibbons *et al.* 1993), calculations based on host parasitism changes in rates suggest that there has been a substantial population decline (Brooke & Davies 1987).

Figure 3.35.1:
Population trend from the Common Birds Census

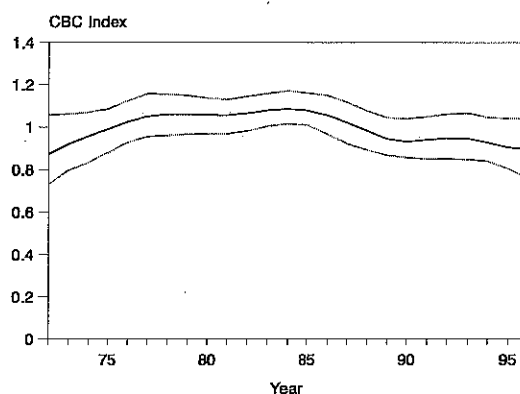


Table 3.35.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	+3	
CBC - Farmland	1972-96	+9	
CBC - Woodland	1972-96	-31	
BBS	1994-96	-1 n.s.	

3.36 BARN OWL *Tyto alba*

3.36.1 CONSERVATION IMPORTANCE

Table 4/Amber (25-50% Distribution decline)
Biodiversity Steering Group Conservation
Concern List

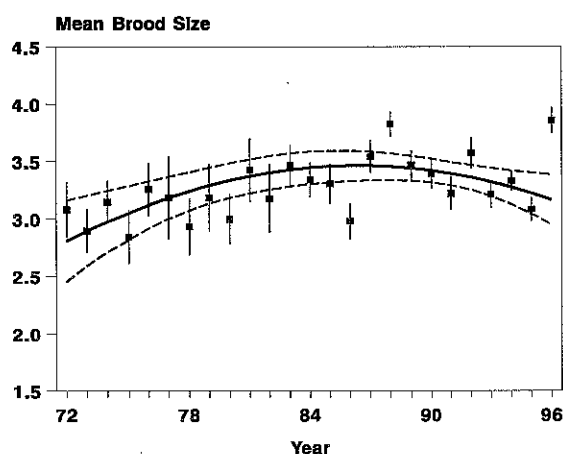
3.36.2 SPECIES SUMMARY

Productivity has tended to improve since the 1950s and 1960s when Barn Owls appear to have been affected by organochlorine pesticides (Percival 1991). However, this improvement appears now to have ceased. A national census, organised jointly by Hawk & Owl Trust and BTO 1995-97 will provide a replicable baseline estimate of population size (Crick *et al.* 1996), but population trends are not monitored annually.

Table 3.36.2: Productivity trends

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1972-96	-ve n.s.	
NRS - young stage nest losses d ⁻¹	1972-96	-ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	-ve n.s.	
NRS - clutch size	1972-96	+ve n.s.	
NRS - brood size	1972-96	2.80-3.46-3.16 *	
NRS - laying date	1972-96	-ve n.s.	Small Sample

Figure 3.36.2: Long-term trend from the Nest Record Scheme



3.37 LITTLE OWL *Athene noctua*

3.37.1 CONSERVATION IMPORTANCE

Unlisted/Green

Biodiversity Steering Group: Unlisted

3.37.2 SPECIES SUMMARY

This mainly crepuscular and nocturnal species is not reliably censused by current monitoring schemes. There is some evidence for contraction from the edges of its range (Gibbons *et al.* 1993). Brood sizes have shown a tendency to increase.

Figure 3.37.1:
Population trend from the Common Birds Census

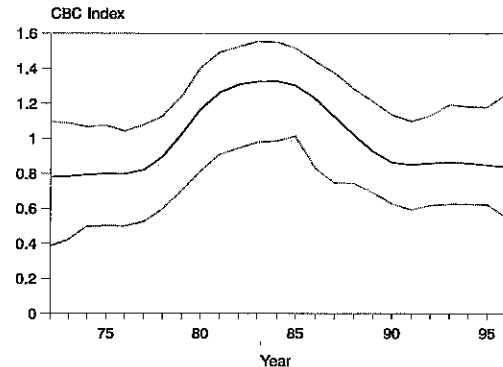


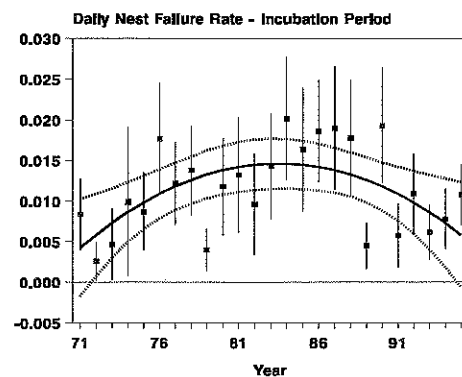
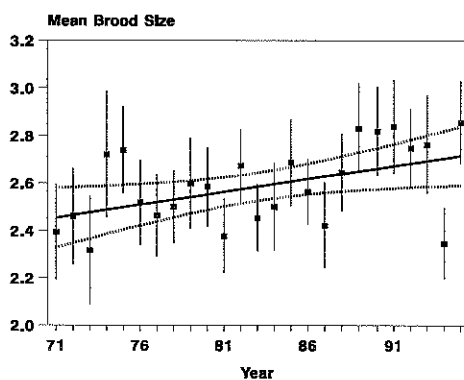
Table 3.37.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	+8	Unrepresentative?
BBS	1994-96	-1 n.s.	

Table 3.37.2: Productivity trends (NRS Data for 1996 unavailable, thus trends are for 1971-1995)

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1971-95	+ve to -ve *	
NRS - young stage nest losses d ⁻¹	1971-95	-ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1971-95	-ve n.s.	
NRS - clutch size	1971-95	+ve n.s.	
NRS - brood size	1971-95	2.46 - 2.72 *	

Figure 3.37.2: Long-term trends from the Nest Record Scheme



3.38.1 CONSERVATION IMPORTANCE

Unlisted/Green

Biodiversity Steering Group Conservation
Concern List

3.38.2 SPECIES SUMMARY

Although Tawny Owls are probably poorly covered by CBC because of their nocturnal habits, the worrying long-term decline is supported by evidence of a range contraction (Gibbons *et al.* 1993). The cyclicity apparent in the population trend may be due to cycles in the abundance of their small mammal prey. Improvements in nesting success are likely to be linked to the declining impact of organochlorine pesticides.

Figure 3.38.1:
Population trend from the Common Birds Census

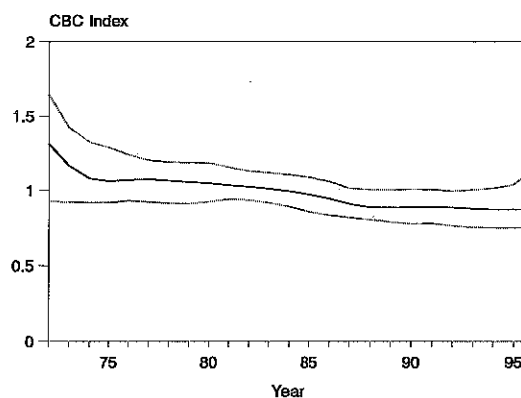


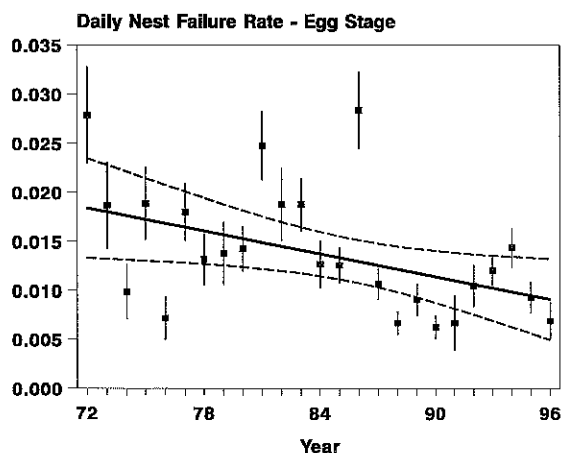
Table 3.38.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	-33	Unrepresentative?
BBS	1994-96	+1 n.s.	

Table 3.38.2: Productivity trends

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1972-96	-ve *	
NRS - young stage nest losses d ⁻¹	1972-96	+ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	-ve *	
NRS - clutch size	1972-96	+ve n.s.	
NRS - brood size	1972-96	+ve n.s.	
NRS - laying date	1972-96	-ve n.s.	

Figure 3.38.2: Long-term trend from the Nest Record Scheme



3.39 LONG-EARED OWL *Asio otus*

3.39.1 CONSERVATION IMPORTANCE

Unlisted/Green
Biodiversity Steering Group Conservation
Concern List

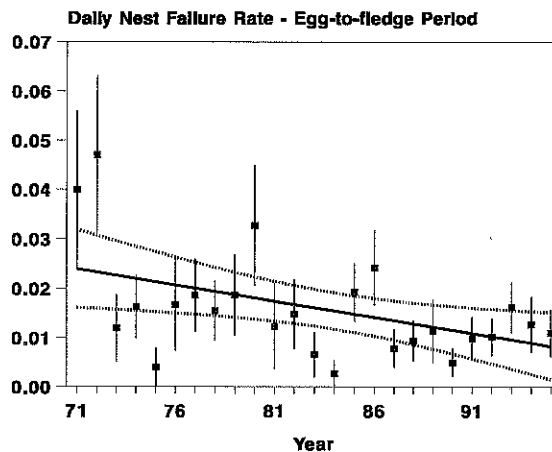
3.39.2 SPECIES SUMMARY

This is one of the most poorly monitored UK species, being very secretive and nocturnal. Its distribution appears to have decreased markedly, but for unknown reasons (Gibbons *et al.* 1993). There is some evidence that nesting success has improved, which, as with most raptors, may be linked to the decreasing effects of organochlorine pesticides.

Table 3.39.2: Productivity trends (NRS Data for 1996 unavailable, thus trends are for 1971-1995)

	Years	Change		Caveat
NRS - egg stage nest losses d ⁻¹	1971-95	-ve	n.s.	Small Sample
NRS - young stage nest losses d ⁻¹	1971-95	-ve	n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1971-95	-ve	*	
NRS - clutch size	1971-95	-ve	n.s.	
NRS - brood size	1971-95	+ve	n.s.	

Figure 3.39.2: Long-term trend from the Nest Record Scheme



3.40 NIGHTJAR *Caprimulgus europaeus*

3.40.1 CONSERVATION IMPORTANCE

Table 2/Red (>50% Distribution decline)
Biodiversity Steering Group Priority Species List

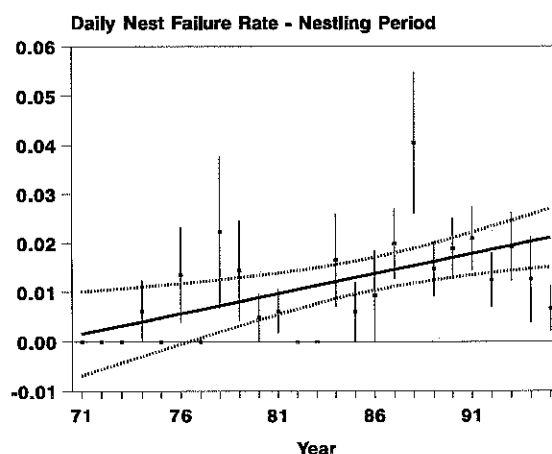
3.40.2 SPECIES SUMMARY

Having suffered a decline in range of more than 50% between breeding atlases, the 1992 national survey revealed a welcome increase of 50% in population size since 1981 probably due to increased availability of young forest habitat as plantations have been felled and replanted (Morris *et al.* 1994). Increased nest failure rates may be due to occupation of a wider range of habitats. Population trends are not monitored annually.

Table 3.40.2: Productivity trends (NRS Data for 1996 unavailable, thus trends are for 1971-1995)

	Years	Change		Caveat
NRS - egg stage nest losses d ⁻¹	1971-95	-ve	n.s.	
NRS - young stage nest losses d ⁻¹	1971-95	+ve	*	
NRS - egg-to-fledge nest losses d ⁻¹	1971-95	+ve	n.s.	
NRS - clutch size	1971-95	-ve	n.s.	
NRS - brood size	1971-95	-ve	n.s.	
NRS - laying date	1971-95	+ve	n.s.	

Figure 3.40.2: Long-term trend from the Nest Record Scheme



3.41 COMMON SWIFT *Apus apus*

3.41.1 CONSERVATION IMPORTANCE

Unlisted/Green

Biodiversity Steering Group: Unlisted

3.41.2 SPECIES SUMMARY

Unmonitored to date, but the BBS will help to fill this gap.

Table 3.41.1: Population trends

	Years	Change %	Caveat
BBS	1994-96	-19 *	

3.42.1 CONSERVATION IMPORTANCE

Table 4/Amber (European status)
Biodiversity Steering Group Conservation
Concern List

3.42.2 SPECIES SUMMARY

The Kingfisher has decreased in range throughout much of England and Northern Ireland, spreading only in lowland Scotland (Gibbons *et al.* 1993) although this is not apparent in the WBS trend. There is a worrying decline in brood size that warrants a Medium BTO Alert. The habitat quality of UK waterways may have declined, possibly due to water pollution, human disturbance and water abstraction (Marchant *et al.* 1990).

Figure 3.42.1:
Population trend from the Waterways Bird Survey

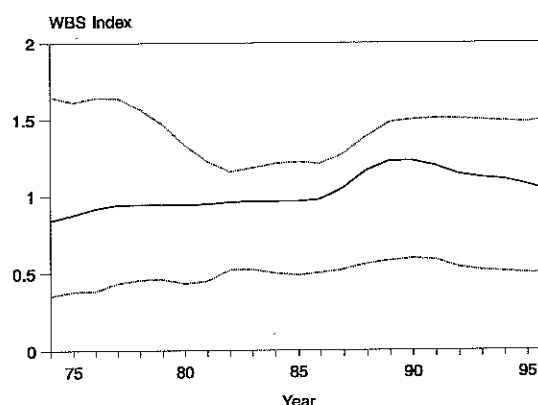


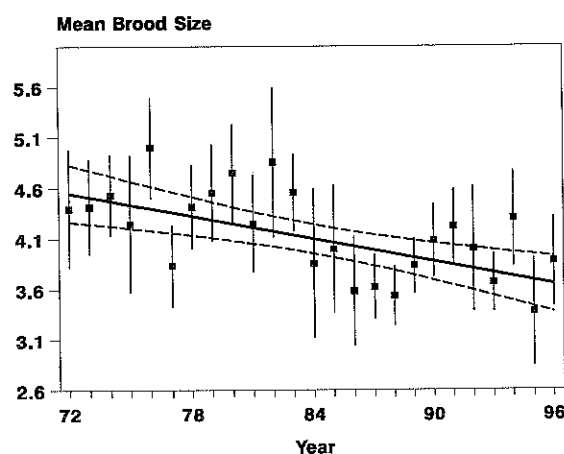
Table 3.42.1: Population trends

	Years	Change %	Caveat
WBS	1974-96	+22	Small Sample (1, early)

Table 3.42.2: Productivity trends

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1972-96	+ve n.s.	Small Sample Unreliable trend
NRS - young stage nest losses d ⁻¹	1972-96	(-ve to +ve *)	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	-ve n.s.	
NRS - brood size	1972-96	4.54 - 3.64 *	

Figure 3.42.2: Long-term trend from the Nest Record Scheme



3.43 GREEN WOODPECKER *Picus viridis*

3.43.1 CONSERVATION IMPORTANCE

Table 4/Amber (European status)
Biodiversity Steering Group Conservation
Concern List

3.43.2 SPECIES SUMMARY

Populations of this species have tended to fluctuate about a fairly constant level, but reasons for these changes are unknown.

Figure 3.43.1:
Population trend from the Common Birds Census

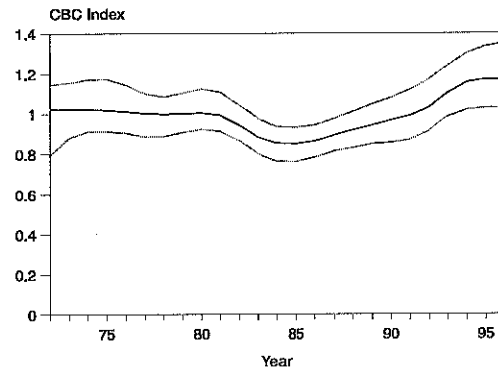


Table 3.43.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	+15	Small Sample (2, middle)
CBC - Farmland	1972-96	-7	
CBC - Woodland	1972-96	-1	
BBS	1994-96	-9 n.s.	

3.44 GREAT SPOTTED WOODPECKER *Dendrocopos major*

3.44.1 CONSERVATION IMPORTANCE

Unlisted/Green
Biodiversity Steering Group Conservation
Concern List

3.44.2 SPECIES SUMMARY

Reasons for the substantial increase in this population during the 1970s are unclear. The very low nest failure rates in recent years do not appear to be an artefact of small samples.

Figure 3.44.1:
Population trend from the Common Birds Census

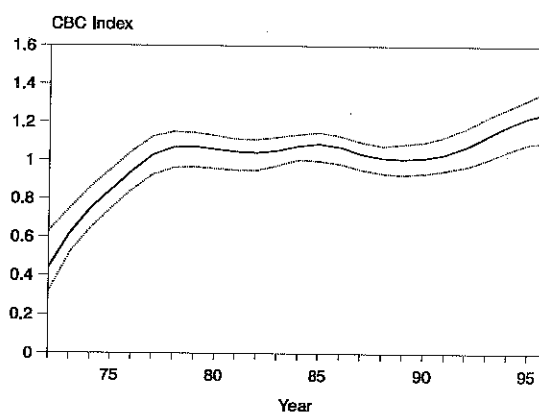


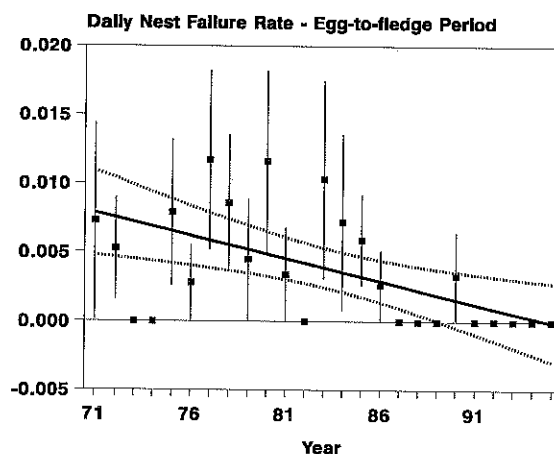
Table 3.44.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	+185	
CBC - Farmland	1972-96	+179	
CBC - Woodland	1972-96	+89	
BBS	1994-96	+30*	

Table 3.44.2: Productivity trends (NRS Data for 1996 unavailable, thus trends are for 1971-1995)

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1971-95	-ve n.s.	Small Sample
NRS - young stage nest losses d ⁻¹	1971-95	-ve *	
NRS - egg-to-fledge nest losses d ⁻¹	1971-95	-ve *	
NRS - brood size	1971-95	-ve n.s.	

Figure 3.44.2: Long-term trend from the Nest Record Scheme



3.45 LESSER SPOTTED WOODPECKER *Dendrocopos minor*

HIGH
BTO ALERT

3.45.1 CONSERVATION IMPORTANCE

Unlisted/Green
Biodiversity Steering Group Conservation
Concern List

3.45.2 SPECIES SUMMARY

It is thought that the population rose in the 1970s due to the spread of Dutch Elm Disease, and the subsequent decline may be linked to the clearance of dead elms (Gibbons *et al.* 1993). The decline is sufficient to warrant a High BTO Alert.

Figure 3.45.1:
Population trend from the Common Birds Census

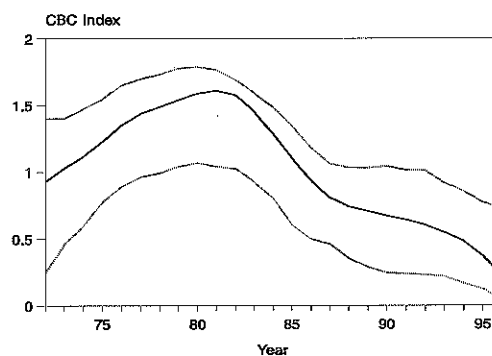


Table 3.45.1: Population trends

	Years	Change %	Caveat
CBC-all	1972-96	-76	Unrepresentative? & Small Sample (11, late)

3.46 WOODLARK *Lullula arborea*

3.46.1 CONSERVATION IMPORTANCE

Table 2/Red (>50% Distribution decline)
Biodiversity Steering Group Priority Species List

3.46.2 SPECIES SUMMARY

Sitters *et al.* (1996) report that the population of this rare breeding bird has increased from c.250 pairs in 1986 to c.600 pairs in 1993, probably helped by recent mild winters and increased habitat availability due to forest storm damage, forest restocking, and heathland management. No strong trends are evident in breeding performance.

Table 3.46.2: Productivity trends (NRS Data for 1996 unavailable, thus trends are for 1971-1995)

	Years	Change		Caveat
NRS - egg stage nest losses d ⁻¹	1971-95	+ve	n.s.	
NRS - young stage nest losses d ⁻¹	1971-95	+ve	n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1971-95	+ve	n.s.	
NRS - clutch size	1971-95	+ve	n.s.	
NRS - brood size	1971-95	-ve	n.s.	
NRS - laying date	1971-95	-ve	n.s.	

3.47.1 CONSERVATION IMPORTANCE

Table 3/Red (>50% Population decline)
Biodiversity Steering Group Priority Species List

3.47.2 SPECIES SUMMARY

After a severe population decline between the mid 1970s and mid 1980s, requiring a High BTO Alert, the population has remained relatively stable. Recent in depth analysis at the BTO suggests that most aspects of breeding performance per nesting attempt have improved and that decreases in adult survival in the proportion of birds attempting to breed, or in the numbers attempting second broods may have influenced the population decline (Chamberlain & Crick in press).

Figure 3.47.1:
Population trend from the Common Birds Census

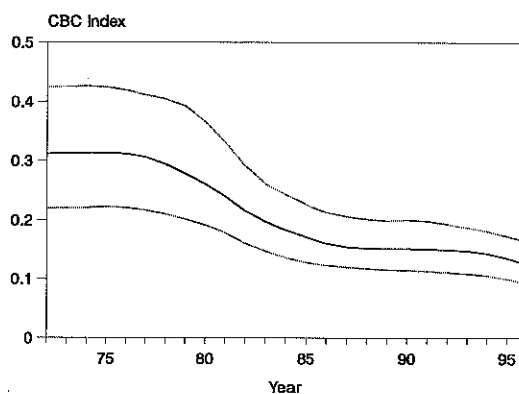


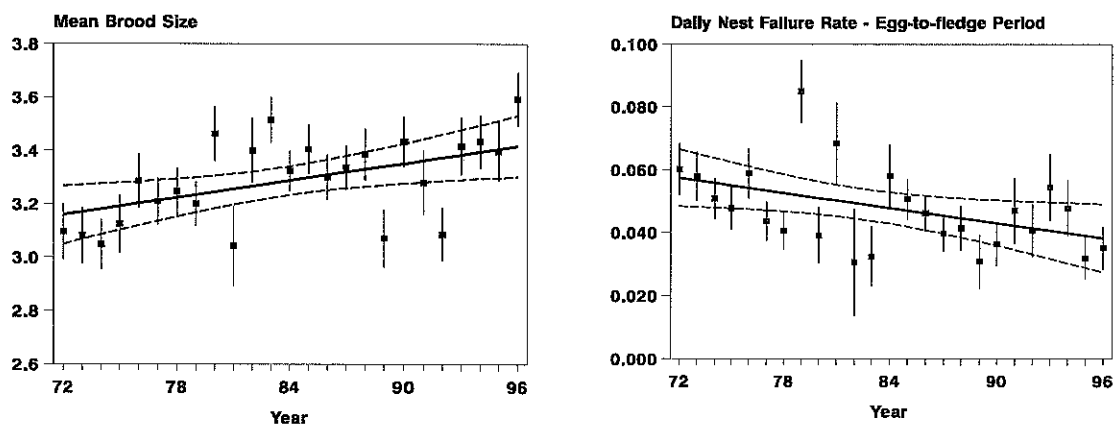
Table 3.47.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	-60	
CBC - Farmland	1972-96	-75	
BBS	1994-96	-1 n.s.	

Table 3.47.2: Productivity trends

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1972-96	+ve n.s.	
NRS - young stage nest losses d ⁻¹	1972-96	-ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	-ve *	
NRS - clutch size	1972-96	3.31 - 3.70 *	
NRS - brood size	1972-96	3.15 - 3.41 *	
NRS - laying date	1972-96	-ve n.s.	

Figure 3.47.2: Long-term trends from the Nest Record Scheme



3.48.1 CONSERVATION IMPORTANCE

Table 4/Amber (25-50% Population decline)
Biodiversity Steering Group Conservation
Concern List

3.48.2 SPECIES SUMMARY

Reanalysis using superior techniques have shown that the apparent population decline requiring the species' inclusion on Table 4 and Amber lists was spurious. Detailed analysis has shown that population fluctuations are most strongly related to losses on their wintering grounds (Baillie & Peach 1992). Nest failure rates during the egg stage increased during the 1970s and 1980s, but now show signs of decreasing. The developing trend towards earlier laying may be linked to global climate change (Crick *et al.* 1997).

Figure 3.48.1:
Population trend from the Common Birds Census

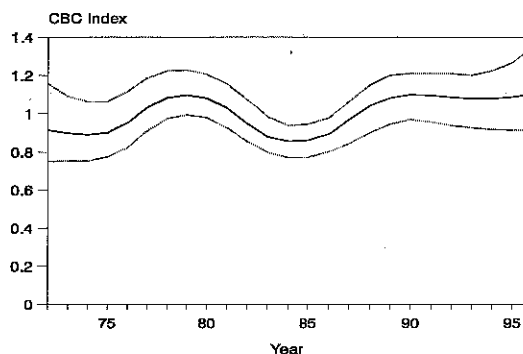


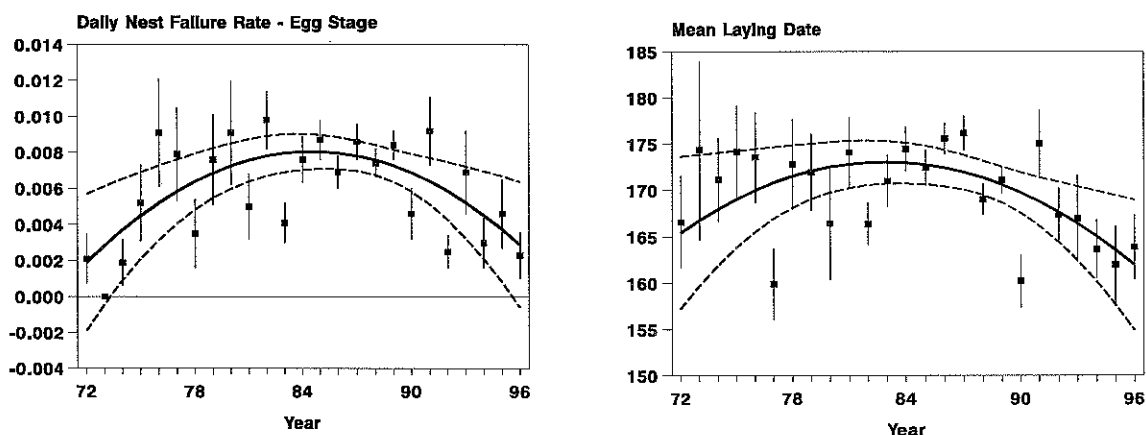
Table 3.48.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	+20	
CBC - Farmland	1972-96	+26	
BBS	1994-96	+4 n.s.	

Table 3.48.2: Productivity trends

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1972-96	+ve to -ve *	
NRS - young stage nest losses d ⁻¹	1972-96	+ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	+ve n.s.	
NRS - clutch size	1972-96	+ve n.s.	
NRS - brood size	1972-96	+ve n.s.	
NRS - laying date	1972-96	165-172-161 *	

Figure 3.48.2: Long-term trends from the Nest Record Scheme



3.49 HOUSE MARTIN *Delichon urbica*

3.49.1 CONSERVATION IMPORTANCE

Unlisted/Green
Biodiversity Steering Group Conservation
Concern List

3.49.2 SPECIES SUMMARY

The CBC index for this species is variable and may be unreliable because it is based on a small sample of nest counts (Marchant *et al.* 1990).

Figure 3.49.1:
Population trend from the Common Birds Census

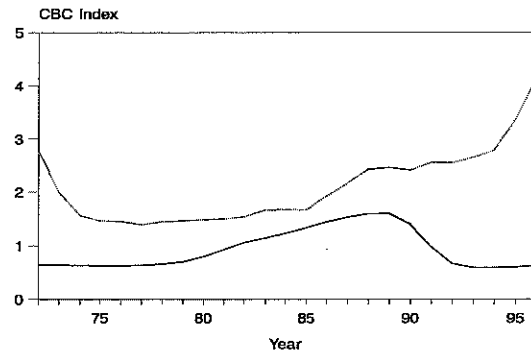


Table 3.49.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	-1	Small Sample (3, middle)
BBS	1994-96	+5 n.s.	

3.50.1 CONSERVATION IMPORTANCE

Unlisted/Green
Biodiversity Steering Group Conservation
Concern List

3.50.2 SPECIES SUMMARY

Tree Pipits occur in greatest abundance in Wales, north England and Scotland and the marked CBC decline, which required a High BTO Alert, may reflect the range contraction that has occurred in central and south-east England (Gibbons *et al.* 1993). Improvements have occurred in breeding performance and the causes of the population decline is unknown.

Figure 3.50.1:
Population trend from the Common Birds Census

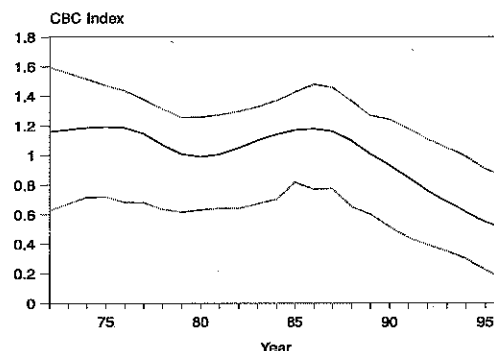


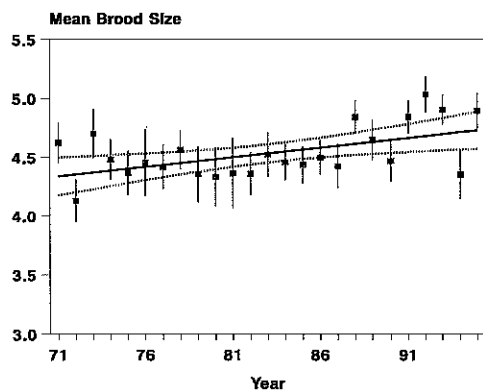
Table 3.50.1: Population trends

	Years	Change %	Caveat
CBC - All	1972-96	-56	Low Densities
BBS	1994-96	+11 n.s.	

Table 3.50.2: Productivity trends (NRS Data for 1996 unavailable, thus trends are for 1971-1995)

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1971-95	-ve to +ve *	Small Sample
NRS - young nest losses d ⁻¹	1971-95	-ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1971-95	-ve to +ve *	
NRS - clutch size	1971-95	5.06 - 4.67 - 5.40 *	
NRS - brood size	1971-95	4.34 - 4.73 *	
NRS - laying date	1971-95	-ve n.s.	

Figure 3.50.2: Long-term trends from the Nest Record Scheme



3.51 MEADOW PIPIT *Anthus pratensis* MEDIUM BTO ALERT

3.51.1 CONSERVATION IMPORTANCE

Unlisted/Green
Biodiversity Steering Group Conservation
Concern List

3.51.2 SPECIES SUMMARY

The population decline on CBC plots requires a Medium BTO Alert. It is probably a reflection of the range contraction that has occurred in lowland areas of central and southern England, which has been linked to loss of marginal land to cultivation; the large fall in the mid 1980s may have been the result of severe weather on their Iberian wintering grounds (Gibbons *et al.* 1993). Breeding performance has generally improved but egg stage nest failures appear to have increased in the 1990s.

Figure 3.51.1:
Population trend from the Common Birds Census

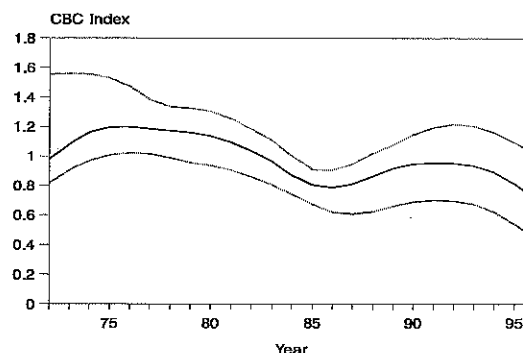


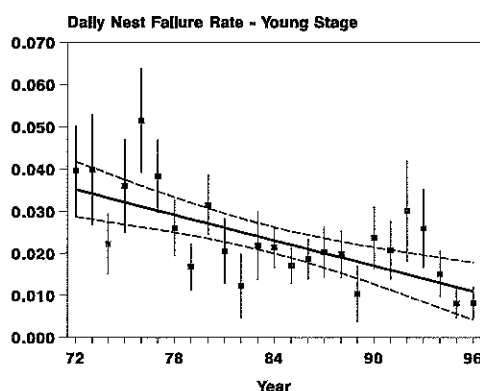
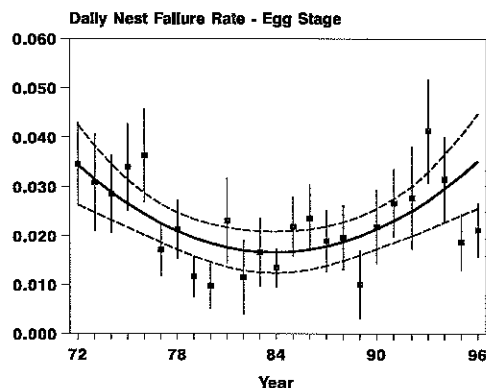
Table 3.51.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	-28	Low Densities
BBS	1994-96	+4 n.s.	

Table 3.51.2: Productivity trends

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1972-96	-ve to +ve *	
NRS - young stage nest losses d ⁻¹	1972-96	-ve *	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	-ve to +ve *	
NRS - clutch size	1972-96	+ve n.s.	
NRS - brood size	1972-96	3.84 - 4.05 *	
NRS - laying date	1972-96	-ve n.s.	

Figure 3.51.2: Long-term trends from the Nest Record Scheme



3.52 ROCK PIPIT *Anthus petrosus*

3.52.1 CONSERVATION IMPORTANCE

Unlisted/Green

Biodiversity Steering Group Conservation
Concern List

3.52.2 SPECIES SUMMARY

This coastal species is poorly covered by BTO census schemes, but there is some evidence of range contraction from the breeding atlases (Gibbons *et al.* 1993). Small samples of nest records indicate no major trends in productivity.

Table 3.52.1: Population trends (NRS Data for 1996 unavailable, thus trends are for 1971-1995)

	Years	Change		Caveat
NRS - egg stage nest losses d ⁻¹	1971-95	-ve	n.s.	Small Sample
NRS - young stage nest losses d ⁻¹	1971-95	+ve	n.s.	Small Sample
NRS - egg-to-fledge nest losses d ⁻¹	1971-95	-ve	n.s.	Small Sample
NRS - clutch size	1971-95	-ve	n.s.	Small Sample
NRS - brood size	1971-95	+ve	n.s.	
NRS - laying date	1971-95	-ve	n.s.	

3.53 YELLOW WAGTAIL *Motacilla flava* MEDIUM BTO ALERT

3.53.1 CONSERVATION IMPORTANCE

Unlisted/Green
Biodiversity Steering Group Conservation
Concern List

3.53.2 SPECIES SUMMARY

Yellow Wagtail appears to have contracted its range on all sides, to become more concentrated in the Midlands of England; severe declines in WBS (requiring a Medium BTO Alert) and CBC indices would support the view that loss of habitat through land drainage and grass conversion to arable has been influential (Gibbons *et al.* 1993). Changes in breeding performance appear too slight to be a factor, although sample sizes of nest record cards are small.

Figure 3.53.1:
Population trend from the Waterways Bird Survey

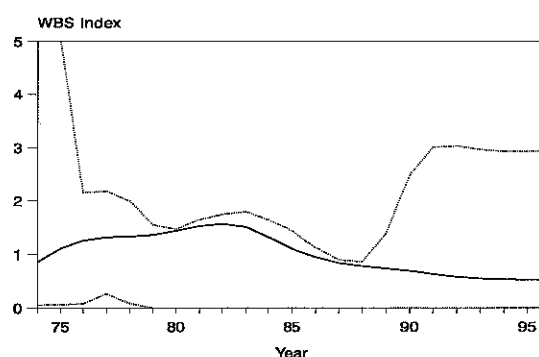


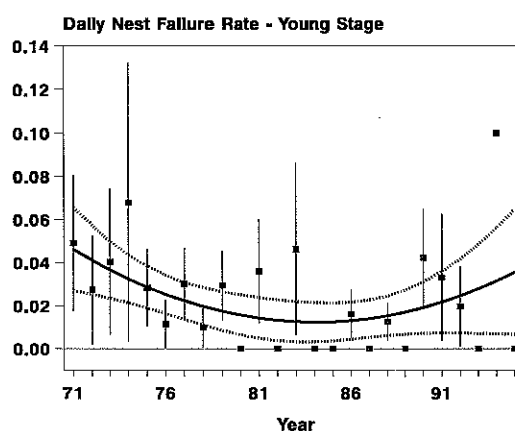
Table 3.53.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	-25	Small Sample (3, late)
WBS	1974-96	-39	Small Sample (9, late)
BBS	1994-96	+51 *	

Table 3.53.2: Productivity trends (NRS Data for 1996 unavailable, thus trends are for 1971-1995)

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1971-95	+ve n.s.	
NRS - young stage nest losses d ⁻¹	1971-95	-ve to +ve *	
NRS - egg-to-fledge nest losses d ⁻¹	1971-95	-ve n.s.	
NRS - clutch size	1971-95	-ve n.s.	Small Sample
NRS - brood size	1971-95	-ve n.s.	
NRS - laying date	1971-95	-ve n.s.	Small Sample

Figure 3.53.2: Long-term trend from the Nest Record Scheme



3.54.1 CONSERVATION IMPORTANCE

Unlisted/Green
Biodiversity Steering Group Conservation
Concern List

3.54.2 SPECIES SUMMARY

This species occurs mainly in upland areas not well covered by CBC and WBS (Marchant *et al.* 1990) but, the decline on WBS plots warrants a Medium BTO Alert. Reproductive performance has improved markedly over the past 25 years.

Figure 3.54.1:
Population trend from the Waterways Bird Survey

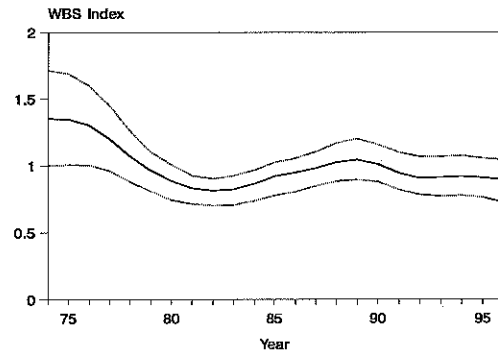


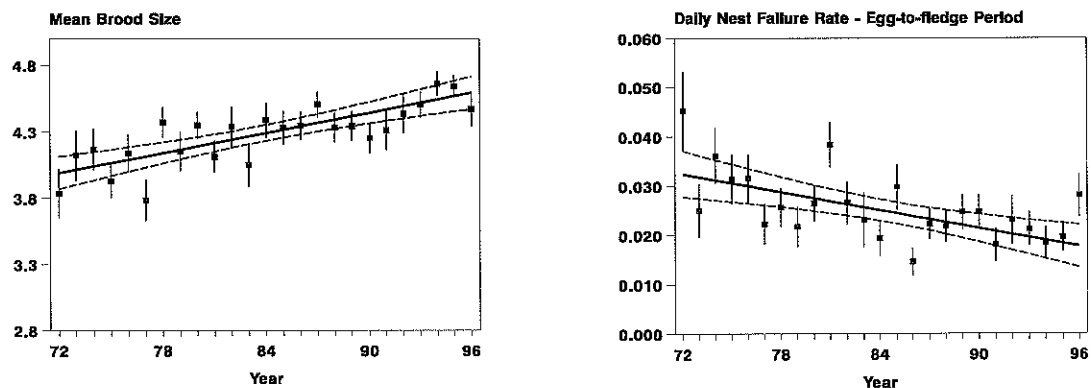
Table 3.54.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	-34	Low Densities & Small Sample (6, early/middle) Low Densities
WBS	1974-96	-34	
BBS	1994-96	-20 n.s.	

Table 3.54.2: Productivity trends

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1972-96	-ve to +ve *	
NRS - young stage nest losses d ⁻¹	1972-96	-ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	-ve *	
NRS - clutch size	1972-96	4.82 - 5.03 *	
NRS - brood size	1972-96	3.99 - 4.58 *	
NRS - laying date	1972-96	-ve n.s.	

Figure 3.54.2: Long-term trends from the Nest Record Scheme



3.55 PIED WAGTAIL *Motacilla alba* MEDIUM BTO ALERT

3.55.1 CONSERVATION IMPORTANCE

Unlisted/Green

Biodiversity Steering Group Conservation Concern List

3.55.2 SPECIES SUMMARY

The centres of abundance of this species occur in upland and northerly areas not well covered by CBC and WBS (Gibbons *et al.* 1993), but the severe decline on WBS plots may be an indication of habitat degradation on English water courses during the 1970s and warrants a Medium BTO Alert. There are no major changes in breeding performance over the past 25 years.

Figure 3.55.1:
Population trends from the Common Birds Census & the Waterways Bird Survey

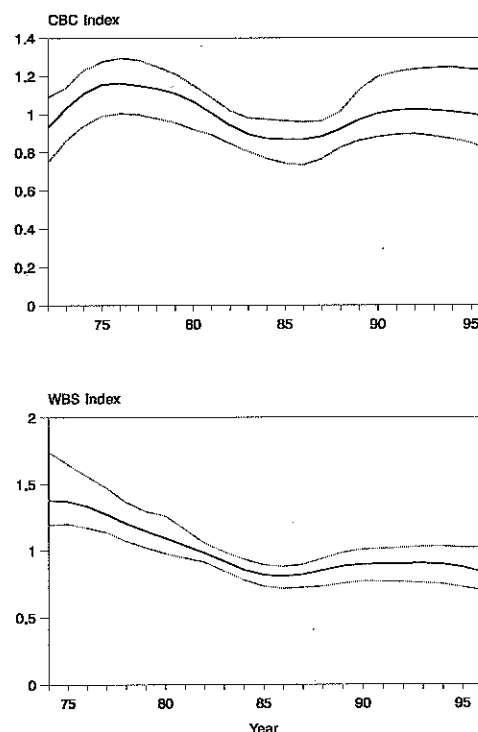


Table 3.55.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	+5	Low Densities
CBC - Farmland	1972-96	0	Low Densities
WBS	1974-96	-39	Low Densities
BBS	1994-96	+16 *	

Table 3.55.2: Productivity trends

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1972-96	-ve n.s.	
NRS - young stage nest losses d ⁻¹	1972-96	+ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	-ve n.s.	
NRS - clutch size	1972-96	-ve n.s.	
NRS - brood size	1972-96	+ve n.s.	
NRS - laying date	1972-96	+ve n.s.	

3.56 DIPPER *Cinclus cinclus*

3.56.1 CONSERVATION IMPORTANCE

Unlisted/Green

Biodiversity Steering Group Conservation
Concern List

3.56.2 SPECIES SUMMARY

A good indicator locally of acidity and other water pollution (Ormerod & Tyler 1989, 1990), the population of this species appears fairly stable and breeding performance has shown strong improvements over time. The trend towards earlier average laying dates may be linked to global climate change (Crick *et al.* 1997).

Figure 3.56.1:
Population trend from the Waterways Bird Survey

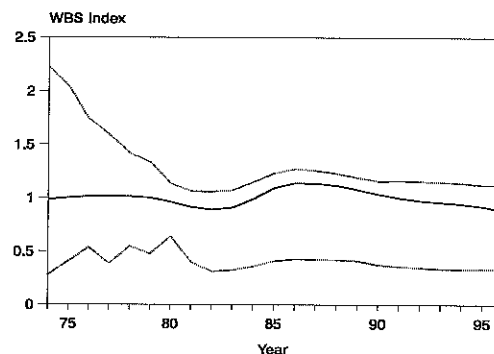


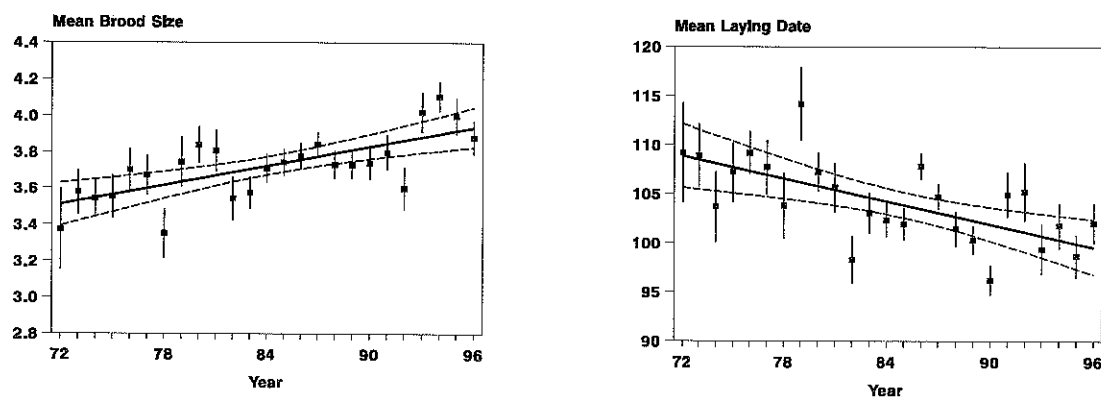
Table 3.56.1: Population trends

	Years	Change %	Caveat
WBS	1974-96	-10	

Table 3.56.2: Productivity trends

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1972-96	-ve to +ve*	
NRS - young stage nest losses d ⁻¹	1972-96	+ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	-ve *	
NRS - clutch size	1972-96	4.40- 4.64-4.52 *	
NRS - brood size	1972-96	3.52- 3.93 *	
NRS - laying date	1972-96	108-99 *	

Figure 3.56.2: Long-term trends from the Nest Record Scheme



3.57 WREN *Troglodytes troglodytes*

3.57.1 CONSERVATION IMPORTANCE

Unlisted/Green

Biodiversity Steering Group: Unlisted

3.57.2 SPECIES SUMMARY

Wren is a species that is strongly affected by severe winter weather (Peach *et al.* 1995). A series of cold winters in the late 1970s and early 1980s depressed breeding populations, but levels are now higher after a series of milder winters.

Figure 3.57.1:
Population trend from the Common Birds Census

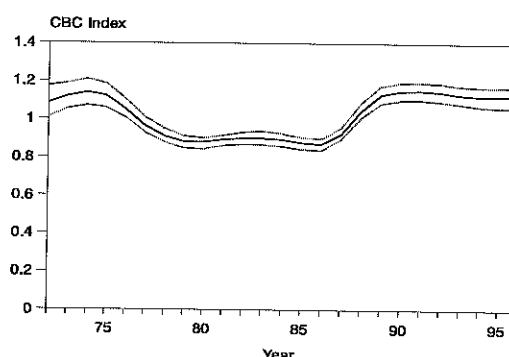


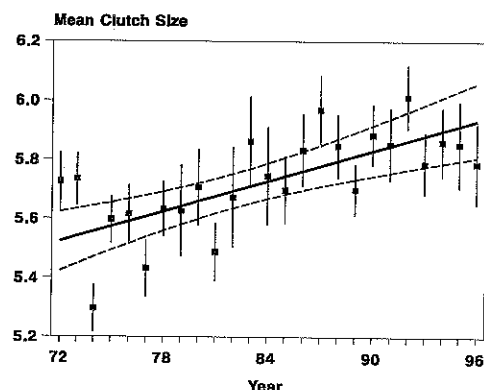
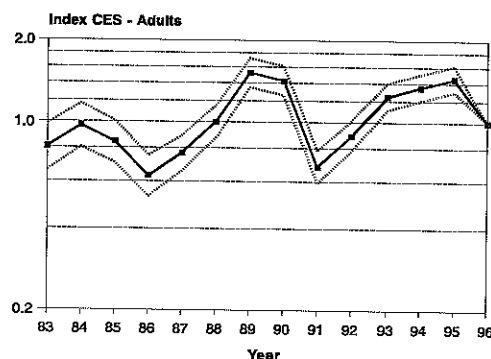
Table 3.57.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	+4	
CBC - Farmland	1972-96	+4	
CBC - Woodland	1972-96	0	
BBS	1994-96	-21 *	
CES - Adults	1983-96	+50 *	
CES - Juveniles	1983-96	+19 *	

Table 3.57.2: Productivity trends

	Years	Change	Caveat
CES % - Juveniles	1983-96	+ve n.s.	
NRS- egg stage nest losses d ⁻¹	1972-96	-ve n.s.	
NRS- young stage nest losses d ⁻¹	1972-96	+ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	-ve n.s.	
NRS - clutch size	1972-96	5.52 - 5.93 *	
NRS - brood size	1972-96	4.58 - 5.33 *	
NRS - laying date	1972-96	-ve n.s.	

Figure 3.57.2: Long-term trends from the Constant Effort Sites and Nest Record Schemes



3.58 DUNNOCK *Prunella modularis* MEDIUM BTO ALERT

3.58.1 CONSERVATION IMPORTANCE

Table 4/Amber (25-50% Population decline)
Biodiversity Steering Group Conservation
Concern

3.58.2 SPECIES SUMMARY

Severe population declines in this common resident has warranted a Medium BTO Alert. Both CES and NRS suggest that breeding performance has improved during the population decline.

Figure 3.58.1:
Population trend from the Common Birds Census

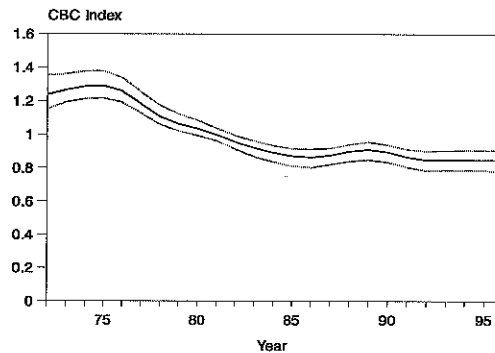


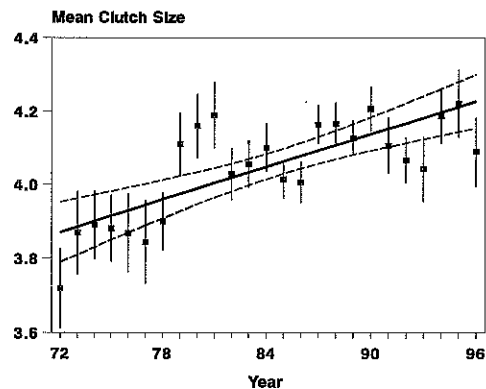
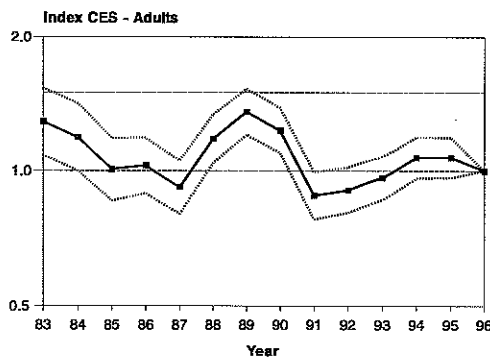
Table 3.58.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	-31	
CBC - Farmland	1972-96	-40	
CBC - Woodland	1972-96	-41	
BBS	1994-96	+3 n.s.	
CES - Adults	1983-96	-14 *	
CES - Juveniles	1983-96	-19 *	

Table 3.58.2: Productivity trends

	Years	Change	Caveat
CES % - Juveniles	1983-96	+ve n.s.	
NRS - egg stage nest losses d ⁻¹	1972-96	+ve n.s.	
NRS - young stage nest losses d ⁻¹	1972-96	-ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	-ve n.s.	
NRS - clutch size	1972-96	3.87 - 4.22 *	
NRS - brood size	1972-96	3.37 - 3.67 *	
NRS - laying date	1972-96	-ve n.s.	

Figure 3.58.2: Long-term trends from the Constant Effort Sites & Nest Record Schemes



3.59 ROBIN *Erithacus rubecula*

3.59.1 CONSERVATION IMPORTANCE

Unlisted/Green

Biodiversity Steering Group: Unlisted

3.59.2 SPECIES SUMMARY

Robin populations are affected by cold-weather fluctuations but show trends of increase in recent years, particularly on CES plots. Breeding performance has shown marked and steady improvements.

Figure 3.59.1:
Population trend from the Common Birds Census

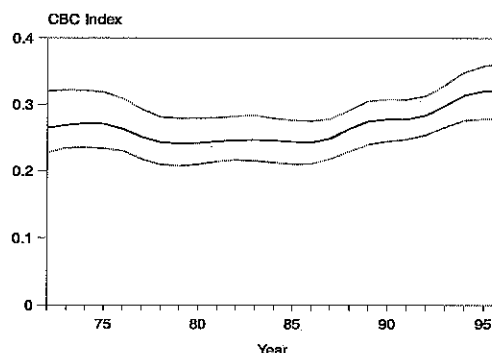


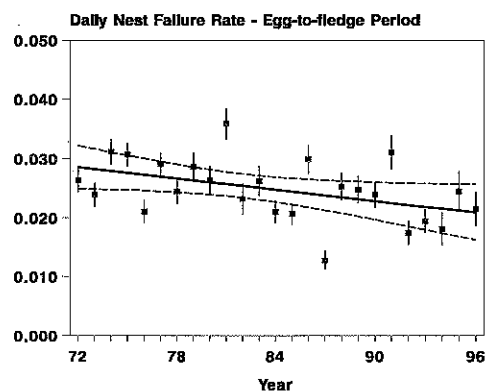
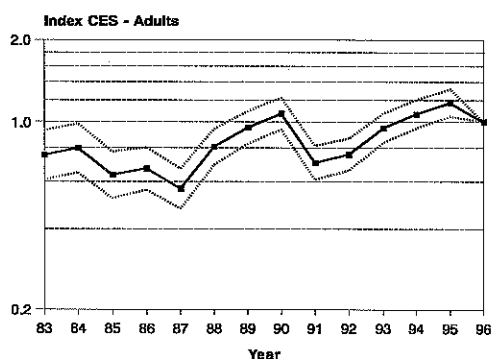
Table 3.59.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	+21	
CBC - Farmland	1972-96	+17	
CBC - Woodland	1972-96	+7	
BBS	1994-96	+2 n.s.	
CES - Adults	1983-96	+69 *	
CES - Juveniles	1983-96	+24 *	

Table 3.59.2: Productivity trends

	Years	Change	Caveat
CES % - Juveniles	1983-96	-ve n.s.	
NRS- egg stage nest losses d ⁻¹	1972-96	-ve n.s.	
NRS- young stage nest losses d ⁻¹	1972-96	+ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	-ve *	
NRS - clutch size	1972-96	4.82 - 4.99 *	
NRS - brood size	1972-96	4.31 - 4.64 *	
NRS - laying date	1972-96	+ve n.s.	

Figure 3.59.2: Long-term trends from the Constant Effort Sites and Nest Record Schemes



3.60 NIGHTINGALE *Luscinia megarhynchos*

3.60.1 CONSERVATION IMPORTANCE

Table 4/Amber (25-50% Distribution decline)
Biodiversity Steering Group Conservation
Concern List

3.60.2 SPECIES SUMMARY

Sample sizes for CES and NRS are small but the former provide support for declining populations and the latter indicates the possibility that nesting success has declined while average brood size has increased. Population declines have been linked to loss of coppiced woodland and to climate change (Gibbons *et al.* 1993).

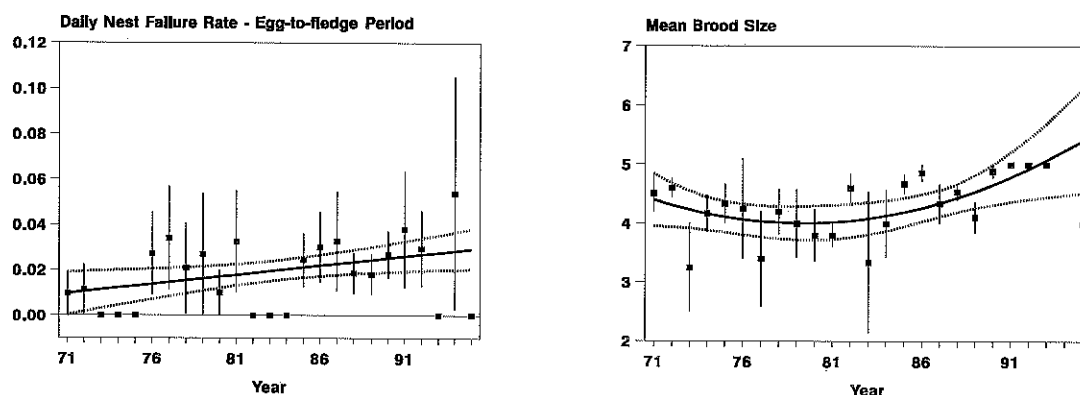
Table 3.60.1: Population trends

	Years	Change %	Caveat
CES - Adults	1983-96	-42 *	Small Sample
CES - Juveniles	1983-96	-62 *	Small Sample

Table 3.60.2: Productivity trends (NRS Data for 1996 unavailable, thus trends are for 1971-1995)

	Years	Change	Caveat
NRS- egg stage nest losses d ⁻¹	1971-95	+ve n.s.	Small Sample
NRS- young stage nest losses d ⁻¹	1971-95	+ve n.s.	Small Sample
NRS - egg-to-fledge nest losses d ⁻¹	1971-95	+ve *	Small Sample
NRS - brood size	1971-95	4.40 - 4.01 - 5.40 *	Small Sample
NRS - laying date	1971-95	-ve n.s.	Small Sample

Figure 3.60.2: Long-term trends from the Nest Record Scheme



3.61 REDSTART *Phoenicurus phoenicurus*

3.61.1 CONSERVATION IMPORTANCE

Table 4/Amber (European Status)
Biodiversity Steering Group Conservation
Concern

3.61.2 SPECIES SUMMARY

Although the New Breeding Atlas shows large losses of range in east and south England (Gibbons *et al.* 1993), the CBC shows populations have increased substantially elsewhere. During this period nesting success has improved, clutch and brood sizes have increased and average laying dates have become substantially earlier.

Figure 3.61.1:
Population trend from the Common Birds Census

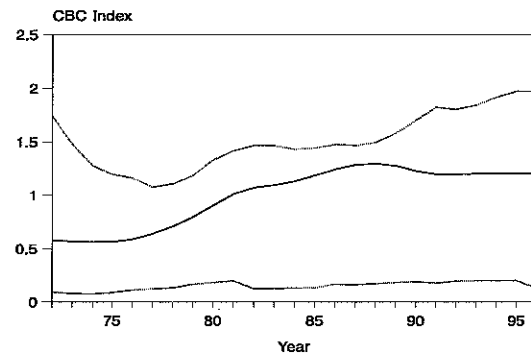


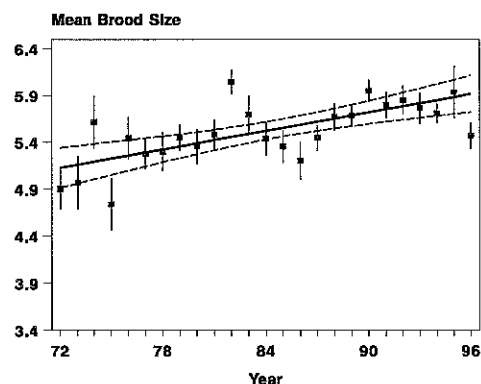
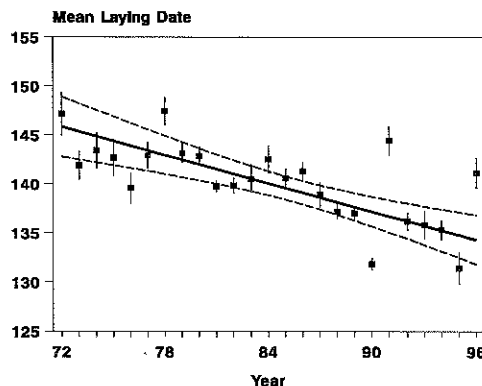
Table 3.61.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	+109	Small Sample (7 early) & Low Densities
BBS	1994-96	+44 *	

Table 3.61.2: Productivity trends

	Years	Change	Caveat
NRS- egg stage nest losses d ⁻¹	1972-96	-ve to +ve *	
NRS- young stage nest losses d ⁻¹	1972-96	-ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	-ve *	
NRS - clutch size	1972-96	6.11 - 6.45 *	
NRS - brood size	1972-96	5.12 - 5.91 *	
NRS - laying date	1972-96	146 - 134 *	

Figure 3.61.2: Long-term trends from the Nest Record Scheme



3.62 WHINCHAT *Saxicola rubetra*

3.62.1 CONSERVATION IMPORTANCE

Unlisted/Green

Biodiversity Steering Group Conservation
Concern List

3.62.2 SPECIES SUMMARY

Mainly an upland species, the New Breeding Atlas showed that its range had contracted considerably in lowland England, probably due to loss of marginal uncultivated land (Gibbons *et al.* 1993). There is little evidence for long-term trends in breeding performance.

Table 3.62.1: Population trends

	Years	Change %	Caveat
BBS	1994-96	+38 *	

Table 3.62.2: Productivity trends

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1972-96	+ve n.s.	
NRS - young stage nest losses d ⁻¹	1972-96	+ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	+ve n.s.	
NRS - clutch size	1972-96	+ve n.s.	
NRS - brood size	1972-96	+ve n.s.	
NRS - laying date	1972-96	+ve n.s.	

3.63 STONECHAT *Saxicola torquata*

3.63.1 CONSERVATION IMPORTANCE

Table 4/Amber (European status)
Biodiversity Steering Group Conservation
Concern List

3.63.2 SPECIES SUMMARY

The New Breeding Atlas records a substantial decline in distribution, with losses from south-west England, south-west and east Scotland, probably due to changes in agriculture (Gibbons *et al.* 1993). Changes in productivity show improving clutch and brood sizes and nesting success at the egg stage.

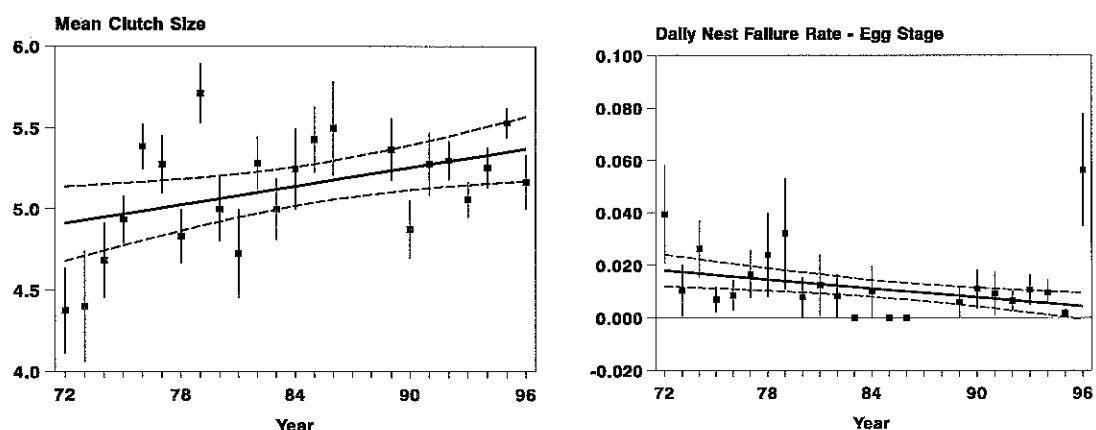
Table 3.63.1: Population trends

	Years	Change %	Caveat
BBS	1994-96	+23 n.s.	Small Sample

Table 3.63.2: Productivity trends

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1972-96	-ve *	
NRS - young stage nest losses d ⁻¹	1972-96	+ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	+ve n.s.	
NRS - clutch size	1972-96	4.91-5.37 *	
NRS - brood size	1972-96	4.60 - 4.97 *	
NRS - laying date	1972-96	+ve n.s.	

Figure 3.63.2: Long-term trends from the Nest Record Scheme



3.64 WHEATEAR *Oenanthe oenanthe*

3.64.1 CONSERVATION IMPORTANCE

Unlisted/Green

Biodiversity Steering Group Conservation
Concern List

3.64.2 SPECIES SUMMARY

This species has suffered a decline in range in lowland England and eastern Scotland which is linked to ploughing of grassland and reductions in rabbit populations due to myxomatosis, although the latter are now recovering (Gibbons *et al.* 1993). Breeding performance has generally improved over the 25-year period.

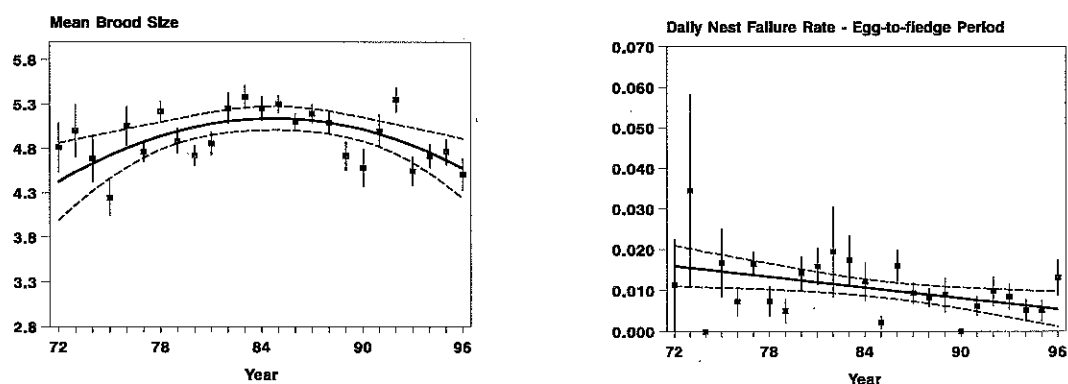
Table 3.64.1: Population trends

	Years	Change %	Caveat
BBS	1994-96	+40 *	

Table 3.64.2: Productivity trends

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1972-96	+ve to -ve *	
NRS - young stage nest losses d ⁻¹	1972-96	-ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	-ve *	
NRS - clutch size	1972-96	+ve n.s.	
NRS - brood size	1972-96	4.42 - 5.14 - 4.57 *	
NRS - laying date	1972-96	-ve n.s.	

Figure 3.64.2: Long-term trends from the Nest Record Scheme



3.65 BLACKBIRD *Turdus merula* MEDIUM BTO ALERT

3.65.1 CONSERVATION IMPORTANCE

Table 4/Amber (25-50% Population decline)
Biodiversity Steering Group: Unlisted

3.65.2 SPECIES SUMMARY

Blackbird populations have declined since the 1970s, requiring a Medium BTO Alert. The CES index suggests that this decline has continued. These declines are likely to be linked to agricultural changes (Fuller *et al.* 1996).

Figure 3.65.1:
Population trend from the Common Birds Census

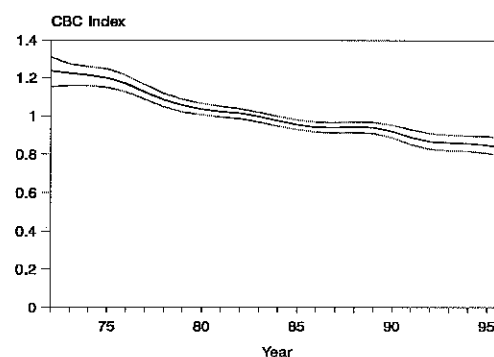


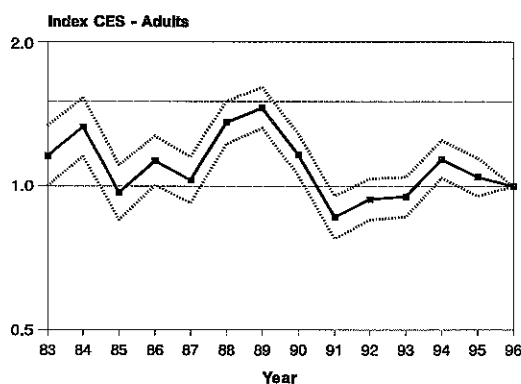
Table 3.65.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	-33	
CBC - Farmland	1972-96	-31	
CBC - Woodland	1972-96	-4	
BBS	1994-96	+1 n.s.	
CES - Adults	1983-96	-19 *	
CES - Juveniles	1983-96	-23 *	

Table 3.65.2: Productivity trends

	Years	Change	Caveat
CES % - Juveniles	1983-96	+ve n.s.	

Figure 3.65.2: Long-term trend from the Constant Effort Sites Scheme



3.66 SONG THRUSH *Turdus philomelos* HIGH BTO ALERT

3.66.1 CONSERVATION IMPORTANCE

Table 3/Red (>50% Population decline)
Biodiversity Steering Group Priority Species List

3.66.2 SPECIES SUMMARY

Detailed analysis has shown that the severe population decline of this species, which requires a High BTO Alert, is due to declines in survival of juveniles in their first year of life: reasons for these declines are unknown (Thomson *et al.* 1997). Over the same period breeding performance has improved.

Figure 3.66.1:
Population trend from the Common Birds Census

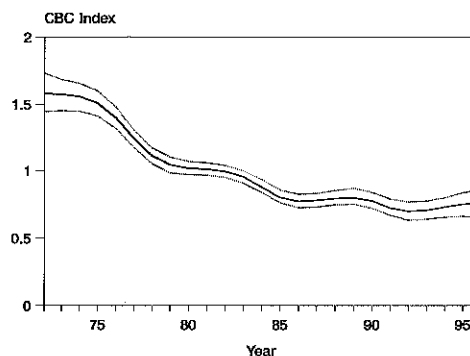


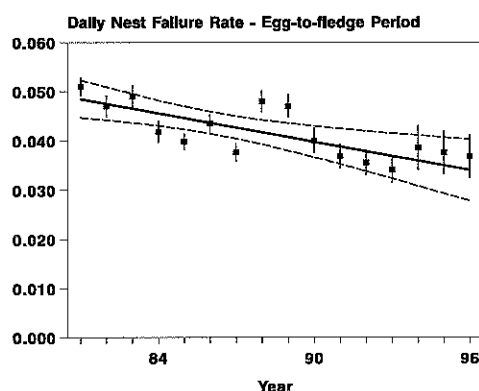
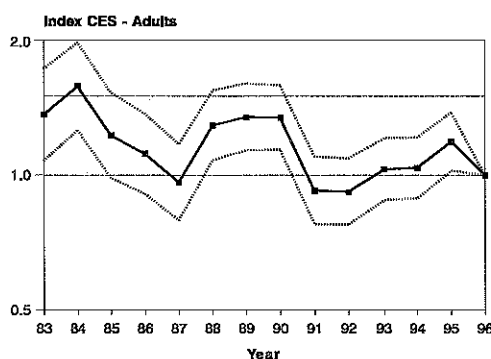
Table 3.66.1: Population trends

	Year	Change %	Caveat
CBC - all	1972-96	-52	
CBC - Farmland	1972-96	-66	
CBC - Woodland	1972-96	-39	
BBS	1994-96	0	n.s.
CES - Adults	1983-96	-23	*
CES - Juveniles	1983-96	-49	*

Table 3.66.2: Productivity trends

	Years	Change	Caveat
CES % - Juveniles	1983-96	-ve n.s.	
NRS - egg stage nest losses d ⁻¹	1981-96	-ve to +ve *	
NRS - young stage nest losses d ⁻¹	1981-96	-ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1981-96	-ve *	
NRS - clutch size	1972-96	+ve n.s.	
NRS - brood size	1972-96	3.58 - 3.78 *	
NRS - laying date	1972-96	+ve n.s.	

Figure 3.66.2: Long-term trends from the Constant Effort Sites & Nest Record Schemes



3.67 MISTLE THRUSH *Turdus viscivorus* MEDIUM BTO ALERT

3.67.1 CONSERVATION IMPORTANCE

Unlisted/Green

Biodiversity Steering Group: Unlisted

3.67.2 SPECIES SUMMARY

Requiring a Medium BTO Alert, the decline in population size of this species is similar to those of Blackbird and Song Thrush. The lack of strong trends in breeding performance imply that survival rates may have decreased, as found for Song Thrush.

Figure 3.67.1:
Population trend from the Common Birds Census

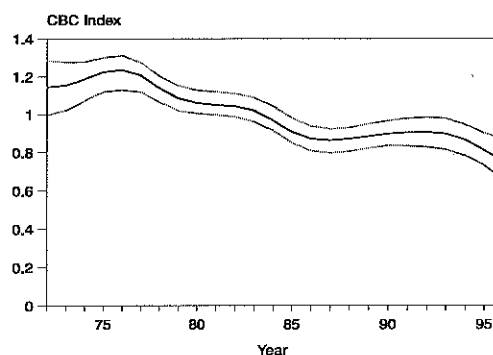


Table 3.67.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	-34	
CBC - Farmland	1972-96	-48	
CBC - Woodland	1972-96	-25	
BBS	1994-96	-10 *	

Table 3.67.2: Productivity trends

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1972-96	+ve n.s.	
NRS - young stage nest losses d ⁻¹	1972-96	+ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	-ve n.s.	
NRS - clutch size	1972-96	+ve n.s.	
NRS - brood size	1972-96	+ve n.s.	
NRS - laying date	1972-96	+ve n.s.	

3.68 GRASSHOPPER WARBLER *Locustella naevia* HIGH BTO ALERT

3.68.1 CONSERVATION IMPORTANCE

Table 4/Amber (25-50% Distribution decline)
Biodiversity Steering Group Conservation
Concern List

3.68.2 SPECIES SUMMARY

Although generally under-recorded, the species' conservation importance was based on range contraction. However, the CBC index also suggests a very severe decline and warrants a High BTO Alert. NRS analysis shows that the species has a high reproductive potential (Glue 1990) so it has been suggested that habitat loss through land drainage and clearance has been a major factor in its decline (Gibbons *et al.* 1993).

Figure 3.68.1:
Population trend from the Common Birds Census

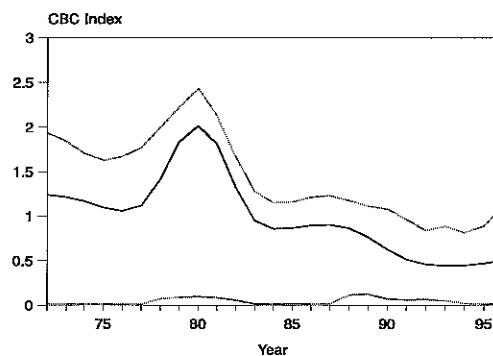


Table 3.68.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	-59	Unrepresentative? & Small Sample (15, late)
BBS	1994-96	+37 n.s.	

3.69 SEDGE WARBLER *Acrocephalus schoenobaenus*

3.69.1 CONSERVATION IMPORTANCE

Unlisted/Green

Biodiversity Steering Group Conservation
Concern List

3.69.2 SPECIES SUMMARY

Detailed analysis has shown that much of the variation in population size is related to changes in adult survival rates which, in turn, are related to changes in rainfall on their

Figure 3.69.1:
Population trend from the Waterways Birds Census

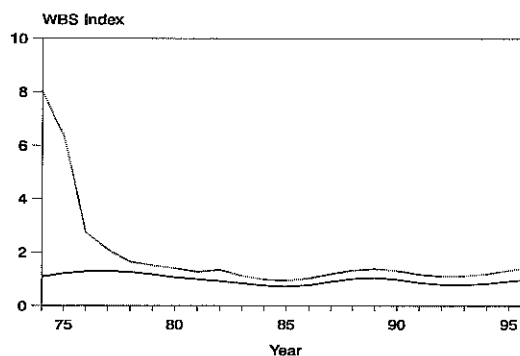


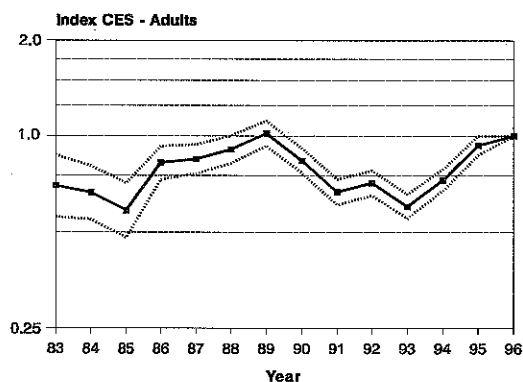
Table 3.69.1: Population trends

	Years	Change %	Caveat
CBC - all	1971-96	-12	Low Densities Low Densities & Small Sample (5, throughout) Low Densities & Small Sample (2, early)
CBC - Farmland	1971-96	+9	
WBS	1974-96	-9	
BBS	1994-96	+27 *	
CES - Adults	1983-96	+15 *	
CES - Juveniles	1983-96	-27 *	

Table 3.69.2: Productivity trends

	Years	Change	Caveat
CES % - Juveniles	1983-96	-ve n.s.	
NRS - egg stage nest losses d ⁻¹	1972-96	+ve n.s.	
NRS - young stage nest losses d ⁻¹	1972-96	+ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	-ve n.s.	
NRS - clutch size	1972-96	-ve n.s.	
NRS - brood size	1972-96	+ve n.s.	
NRS - laying date	1972-96	+ve n.s.	

Figure 3.69.2: Long-term trend from the Constant Effort Sites Scheme



3.70 REED WARBLER *Acrocephalus scirpaceus*

3.70.1 CONSERVATION IMPORTANCE

Unlisted/Green
Biodiversity Steering Group Conservation
Concern List

3.70.2 SPECIES SUMMARY

The large increase in CBC index may be unrepresentative because it is based on a relatively small sample of mainly coastal plots (Marchant *et al.* 1990). Distributionally there has been little change (Gibbons *et al.* 1993). The CES reports a substantial decline up to 1991, but this has been followed by recovery. Productivity has tended to increase over the period.

Figure 3.70.1:
Population trend from the Common Birds Census

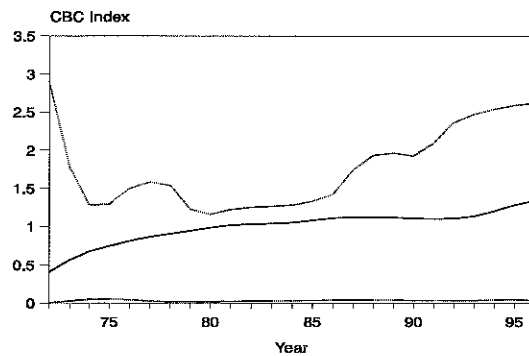


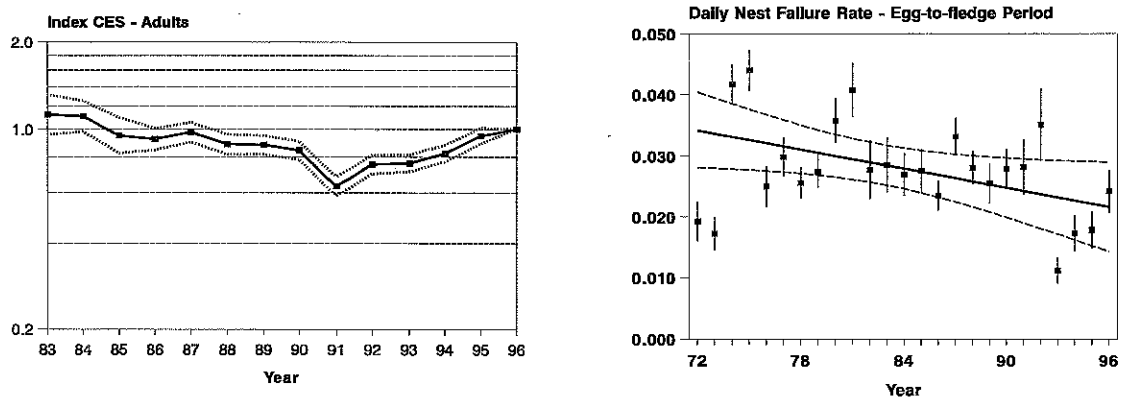
Table 3.70.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	+228	Small Sample (7, early)
BBS	1994-96	+3 n.s.	
CES - Adults	1983-96	-6 n.s.	
CES - Juveniles	1983-96	-4 n.s.	

Table 3.70.2: Productivity trends

	Years	Change	Caveat
CES % - Juveniles	1983-95	+ve n.s.	
NRS - egg stage nest losses d ⁻¹	1972-96	-ve n.s.	
NRS - young stage nest losses d ⁻¹	1972-96	+ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	-ve *	
NRS - clutch size	1972-96	+ve n.s.	
NRS - brood size	1972-96	3.38 - 3.60 *	
NRS - laying date	1972-96	-ve n.s.	

Figure 3.70.2: Long-term trends from the Constant Effort Sites and Nest Record Schemes



3.71 LESSER WHITETHROAT *Sylvia curruca*

3.71.1 CONSERVATION IMPORTANCE

Unlisted/Green
Biodiversity Steering Group Conservation
Concern List

3.71.2 SPECIES SUMMARY

This species has expanded its range to the north and west (Gibbons *et al.* 1993) but has shown little long-term trend in population size. Productivity has shown little in the way of long-term trend.

Figure 3.71.1:
Population trend from the Common Birds Census

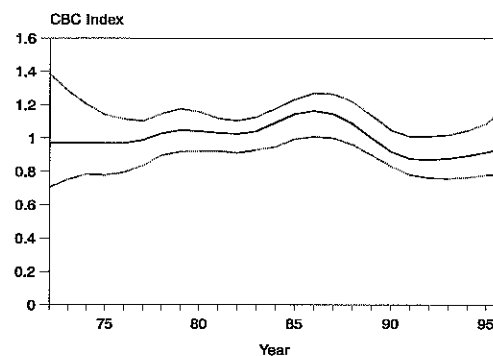


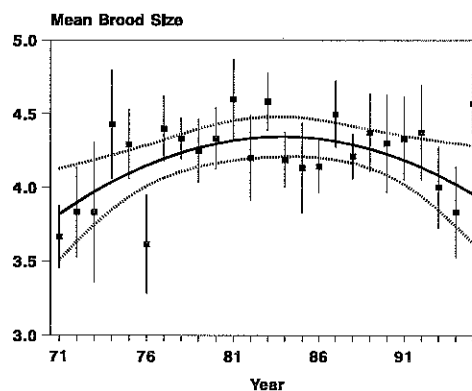
Table 3.71.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	-3	
CBC - Farmland	1972-96	-24	
BBS	1994-96	-23 *	
CES - Adults	1983-96	-19 n.s.	
CES - Juveniles	1983-96	+8 n.s.	

Table 3.71.2: Productivity trends (NRS Data for 1996 unavailable, thus trends are for 1971-1995)

	Years	Change	Caveat
CES % - Juveniles	1983-95	+ve n.s.	
NRS - egg stage nest losses d ⁻¹	1971-95	-ve n.s.	Small Sample
NRS - young stage nest losses d ⁻¹	1971-95	-ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1971-95	-ve n.s.	Small Sample
NRS - clutch size	1971-95	+ve n.s.	Small Sample
NRS - brood size	1971-95	3.82 - 4.35 - 3.95 *	
NRS - laying date	1971-95	-ve n.s.	Small Sample

Figure 3.71.2: Long-term trend from the Nest Record Scheme



3.72 WHITETHROAT *Sylvia communis*

3.72.1 CONSERVATION IMPORTANCE

Unlisted/Green
Biodiversity Steering Group Conservation
Concern List

3.72.2 SPECIES SUMMARY

Whitethroat populations crashed by 75% between 1968 and 1969 due to drought in West Africa (Winstanley *et al.* 1974) and population fluctuations are related to over-wintering survival (Baillie & Peach 1992). After 1969, populations remained low until the late 1980s, since when they have increased to make a partial recovery. On woodland the populations have remained low for unknown reasons. There has been little change in productivity over the period, but average laying dates have become earlier (Crick *et al.* 1997).

Figure 3.72.1:
Population trend from the Common Birds Census

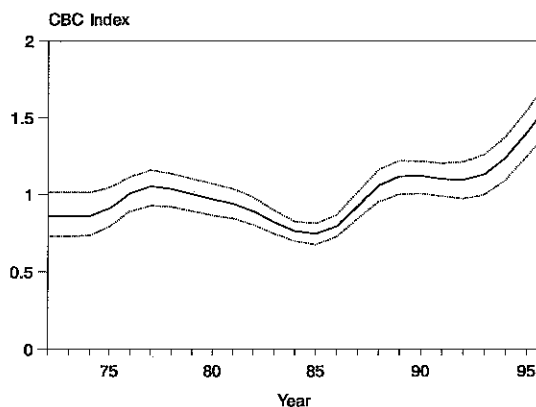


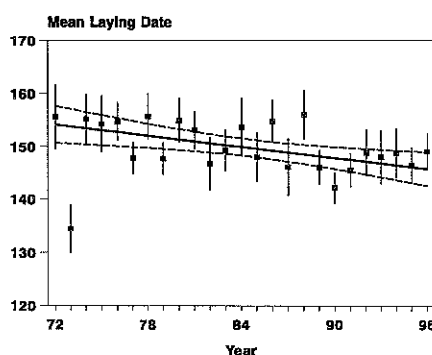
Table 3.72.1: Population trends

	Years	Change		Caveat
CBC - all	1972-96	+83		Small Sample (2, early) Small Sample (3, early)
CBC - Farmland	1972-96	+105		
CBC - Woodland	1972-96	-14		
WBS	1974-96	+142		
BBS	1994-96	+28	*	
CES - Adults	1983-96	+11	n.s.	
CES - Juveniles	1983-96	-1	n.s.	

Table 3.72.2: Productivity trends

	Years	Change		Caveat
CES % - Juveniles	1983-96	+ve	n.s.	
NRS - egg stage nest losses d ⁻¹	1972-96	+ve	n.s.	
NRS - young stage nest losses d ⁻¹	1972-96	+ve	n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	+ve	n.s.	
NRS - clutch size	1972-96	-ve	n.s.	
NRS - brood size	1972-96	+ve	n.s.	
NRS - laying date	1972-96	154 - 145	*	

Figure 3.72.2: Long-term trend from the Nest Record Scheme



3.73 GARDEN WARBLER *Sylvia borin*

3.73.1 CONSERVATION IMPORTANCE

Unlisted/Green
Biodiversity Steering Group Conservation
Concern List

3.73.2 SPECIES SUMMARY

Garden Warbler populations dropped gradually during the 1960s (Marchant *et al.* 1990), recovered during the 1970s and levelled off from the mid 1980s. Productivity has shown little long-term trend.

Figure 3.73.1:
Population trend from the Common Birds Census

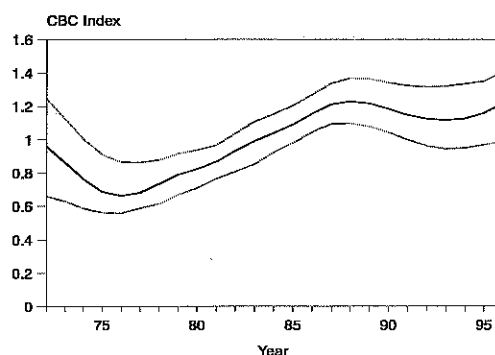


Table 3.73.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	+27	Small Sample (1, early)
CBC - Farmland	1972-96	-7	
CBC - Woodland	1972-96	+20	
BBS	1994-95	+18 *	
CES - Adults	1983-95	+3 n.s.	
CES - Juveniles	1983-95	+7 n.s.	

Table 3.73.2: Productivity trends (NRS Data for 1996 unavailable, thus trends are for 1971-1995)

	Years	Change	Caveat
CES % - Juveniles	1983-95	+ve n.s.	
NRS - egg stage nest losses d ⁻¹	1971-95	-ve n.s.	
NRS - young stage nest losses d ⁻¹	1971-95	+ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1971-95	-ve n.s.	
NRS - clutch size	1971-95	-ve n.s.	
NRS - brood size	1971-95	+ve n.s.	
NRS - laying date	1971-95	-ve n.s.	

3.74 BLACKCAP *Sylvia atricapilla*

3.74.1 CONSERVATION IMPORTANCE

Unlisted/Green
Biodiversity Steering Group Conservation
Concern List

3.74.2 SPECIES SUMMARY

Blackcap populations have been increasing steadily from the 1960s, involving some northward spread in Scotland, but for unknown reasons (Gibbons *et al.* 1993). Breeding performance appears not to have changed substantially.

Figure 3.74.1:
Population trend from the Common Birds Census

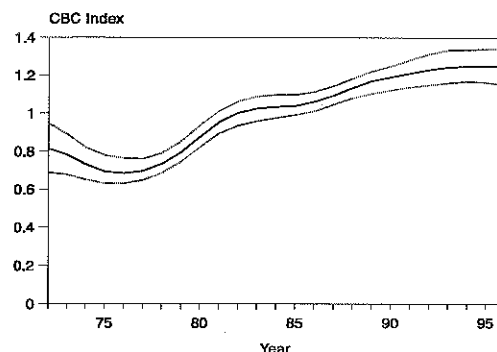


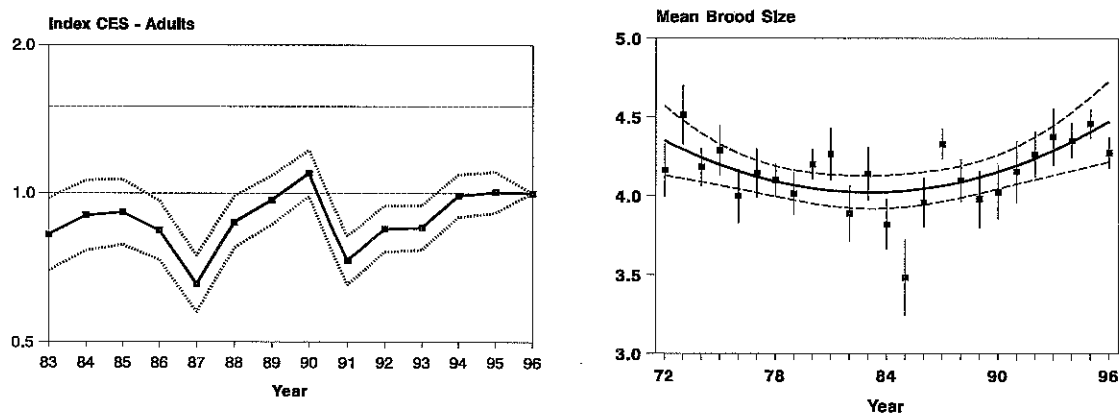
Table 3.74.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	+54	
CBC - Farmland	1972-96	+83	
CBC - Woodland	1972-96	+27	
BBS	1994-96	+3 n.s.	
CES - Adults	1983-96	+23 *	
CES - Juveniles	1983-96	+5 n.s.	

Table 3.74.2: Productivity trends

	Years	Change	Caveat
CES % - Juveniles	1983-96	+ve n.s.	
NRS - egg stage nest losses d ⁻¹	1972-96	-ve n.s.	
NRS - young stage nest losses d ⁻¹	1972-96	-ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	-ve n.s.	
NRS - clutch size	1972-96	+ve n.s.	
NRS - brood size	1972-96	4.35-4.02-4.47 *	
NRS - laying date	1972-96	-ve n.s.	

Figure 3.74.2: Long-term trends from the Constant Effort Sites and Nest Record Schemes



3.75 WOOD WARBLER *Phylloscopus sibilatrix*

3.75.1 CONSERVATION IMPORTANCE

Unlisted/Green
Biodiversity Steering Group Conservation
Concern List

3.75.2 SPECIES SUMMARY

Wood Warblers occur predominantly in western Britain and appear to have shown little long-term population change since 1975 and little trend in breeding performance. The trend towards earlier average laying dates may be linked to global climate change (Crick *et al.* 1997).

Figure 3.75.1:
Population trend from the Common Birds Census

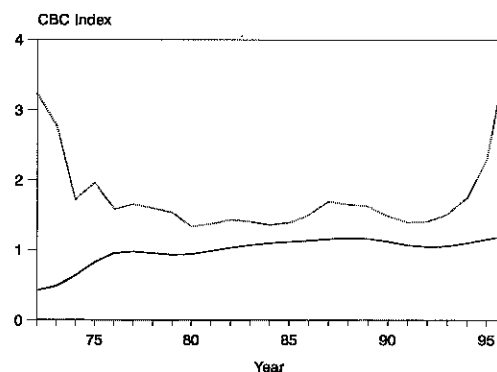


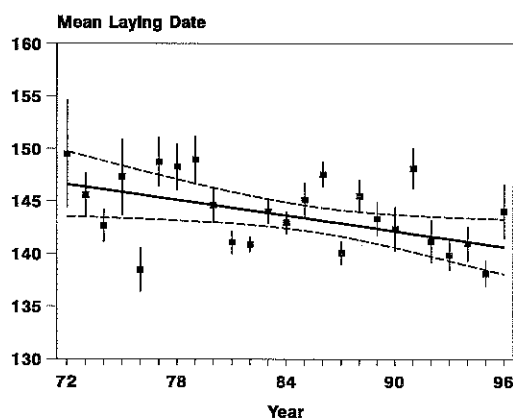
Table 3.75.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	+184	Low Densities & Small Sample (13, throughout)
BBS	1994-96	-38 *	

Table 3.75.2: Productivity trends

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1972-96	-ve n.s.	
NRS - young stage nest losses d ⁻¹	1972-96	-ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	-ve n.s.	
NRS - clutch size	1972-96	-ve n.s.	
NRS - brood size	1972-96	+ve n.s.	
NRS - laying date	1972-96	146-140 *	

Figure 3.75.2: Long-term trend from the Nest Record Scheme



3.76 CHIFFCHAFF *Phylloscopus collybita*

3.76.1 CONSERVATION IMPORTANCE

Unlisted/Green
Biodiversity Steering Group Conservation
Concern List

3.76.2 SPECIES SUMMARY

Overall, the population has shown little long-term trend, but the fluctuations are similar to those of the Sedge Warbler, suggesting that over-wintering losses are important. The strong trend towards earlier average laying dates may be linked to global climate change (Crick *et al.* 1997).

Figure 3.76.1:
Population trend from the Common Birds Census

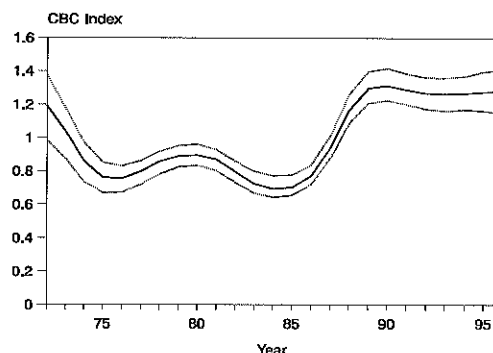


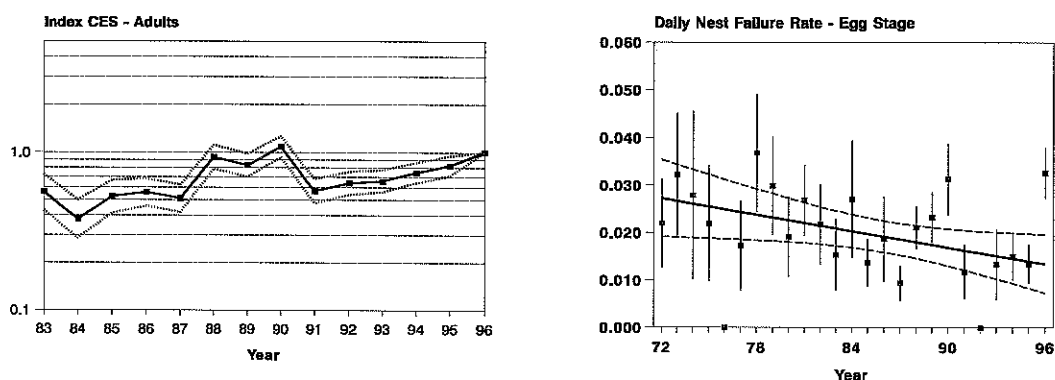
Table 3.76.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	+7	
CBC - Farmland	1972-96	+1	
CBC - Woodland	1972-96	+3	
BBS	1994-96	+9 *	
CES - Adults	1983-96	+62 *	
CES - Juveniles	1983-96	+26 *	

Table 3.76.2: Productivity trends

	Years	Change	Caveat
CES % - Juveniles	1983-96	+ve n.s.	
NRS - egg stage nest losses d ⁻¹	1972-96	-ve *	
NRS - young stage nest losses d ⁻¹	1972-96	+ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	-ve n.s.	
NRS - clutch size	1972-96	+ve n.s.	
NRS - brood size	1972-96	+ve n.s.	
NRS - laying date	1972-96	139 - 125 *	

Figure 3.76.2: Long-term trends from the Constant Effort Sites and Nest Record Schemes



3.77 WILLOW WARBLER *Phylloscopus trochilus* MEDIUM BTO ALERT

3.77.1 CONSERVATION IMPORTANCE

Unlisted/Green
Biodiversity Steering Group Conservation
Concern List

3.77.2 SPECIES SUMMARY

Detailed analysis has shown that the severe population decline in the late 1980s was restricted to the southern part of the UK and was strongly linked to changes in adult survival, and that increases in daily nest failure rates had only a small effect (Peach *et al.* 1995). The decline on CES plots requires a Medium BTO Alert. The strong trend towards earlier average laying dates may be linked to global climate change (Crick *et al.* 1997)

Figure 3.77.1:
Population trend from the Common Birds Census

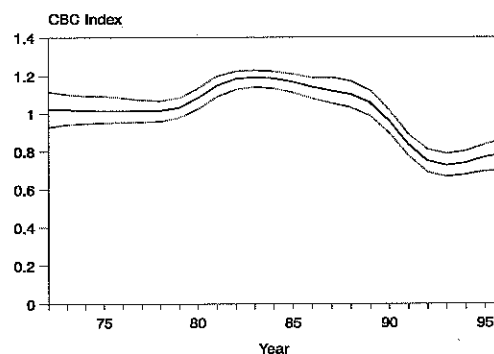


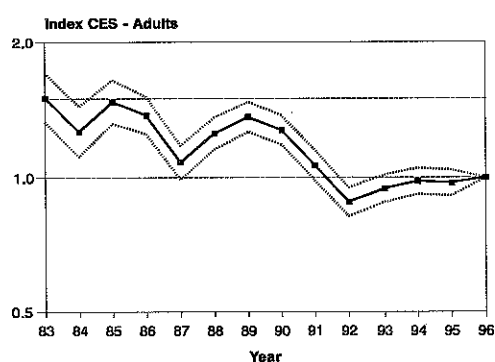
Table 3.77.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	-23	
CBC - Farmland	1972-96	-10	
CBC - Woodland	1972-96	-39	
BBS	1994-96	+14 *	
CES - Adults	1983-96	-37 *	
CES - Juveniles	1983-96	-47 *	

Table 3.77.2: Productivity trends

	Years	Change	Caveat
CES % - Juveniles	1983-96	+ve n.s.	
NRS - egg stage nest losses d ⁻¹	1972-96	+ve n.s.	
NRS - young stage nest losses d ⁻¹	1972-96	+ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	-ve n.s.	
NRS - clutch size	1972-96	+ve n.s.	
NRS - brood size	1972-96	4.88 - 5.36 *	
NRS - laying date	1972-96	141 - 134 *	

Figure 3.77.2: Long-term trends from Constant Effort Sites and the Nest Record Schemes



3.78.1 CONSERVATION IMPORTANCE

Unlisted/Green
Biodiversity Steering Group Conservation
Concern List

3.78.2 SPECIES SUMMARY

Goldcrest populations fluctuate strongly as a result of winter weather. However, the smoothed trend shows no sign of recovery, which contrasts with trends for other small resident insectivores, such as Wren and Long-tailed Tit which have recovered after drops in the late 1970s and 1980s. It should be noted that few CBC plots consist of pure conifer woodland and that most only hold a small number of Goldcrests. A BTO Alert is issued for Goldcrest under the precautionary principle.

Figure 3.78.1:
Population trend from the Common Birds Census

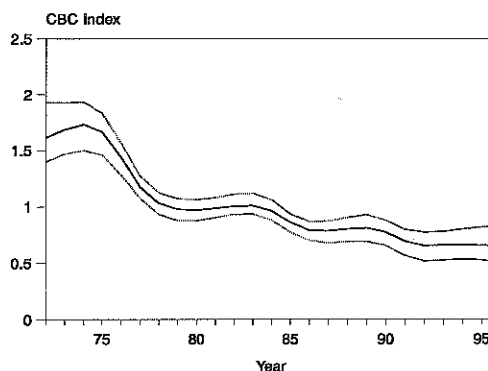


Table 3.78.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	-60	Small Sample (3, late)
CBC - Farmland	1972-96	-54	
CBC - Woodland	1972-96	-61	
BBS	1994-96	+9 n.s.	

Table 3.78.2: Productivity trends (NRS Data for 1996 unavailable, thus trends are for 1971-1995)

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1971-95	+ve n.s.	Small Sample
NRS - young stage nest losses d ⁻¹	1971-95	-ve n.s.	Small Sample
NRS - egg-to-fledge nest losses d ⁻¹	1971-95	+ve n.s.	Small Sample
NRS - clutch size	1971-95	-ve n.s.	Small Sample
NRS - brood size	1971-95	-ve n.s.	Small Sample
NRS - laying date	1971-95	-ve n.s.	Small Sample

3.79 SPOTTED FLYCATCHER *Muscicapa striata* HIGH BTO ALERT

3.79.1 CONSERVATION IMPORTANCE

Table 3/Red (>50% Population decline)
Biodiversity Steering Group Priority Species List

3.79.2 SPECIES SUMMARY

Since breeding performance has generally improved, the severe population decline of this long-distance migrant, which warrants a High BTO Alert, are likely to be linked to changes in over-wintering survival.

Figure 3.79.1:
Population trend from the Common Birds Census

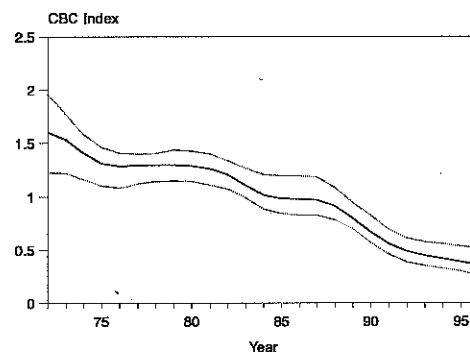


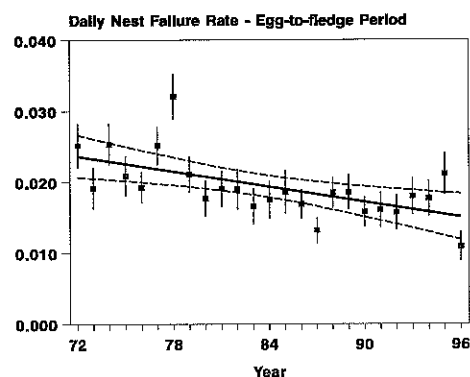
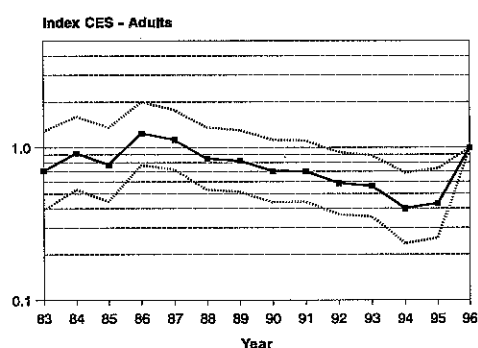
Table 3.79.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	-78	Small Sample (2,early)
CBC - Farmland	1972-96	-78	
CBC - Woodland	1972-96	-78	
BBS	1994-96	-14 n.s.	Small Sample Small Sample
CES - Adults	1983-96	-45 *	
CES - Juveniles	1983-96	-47 *	

Table 3.79.2: Productivity trends

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1972-96	-ve to +ve *	
NRS - young stage nest losses d ⁻¹	1972-96	+ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	-ve *	
NRS - clutch size	1972-96	+ve n.s.	
NRS - brood size	1972-96	3.65 - 3.81 *	
NRS - laying date	1972-96	-ve n.s.	

Figure 3.79.2: Long-term trends from the Constant Effort Sites and the Nest Record Schemes



3.80 LONG-TAILED TIT *Aegithalos caudatus*

3.80.1 CONSERVATION IMPORTANCE

Unlisted/Green

Biodiversity Steering Group: Unlisted

3.80.2 SPECIES SUMMARY

Large population fluctuations in this species are likely to be due mainly to winter weather. In recent years the population has tended to increase associated with increases in productivity. The recent trend towards earlier laying may be linked to global climate change (Crick *et al.* 1997).

Figure 3.80.1:
Population trend from the Common Birds Census

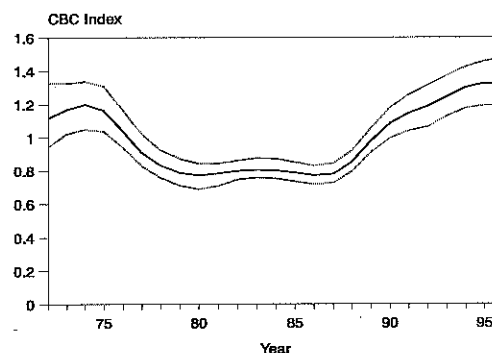


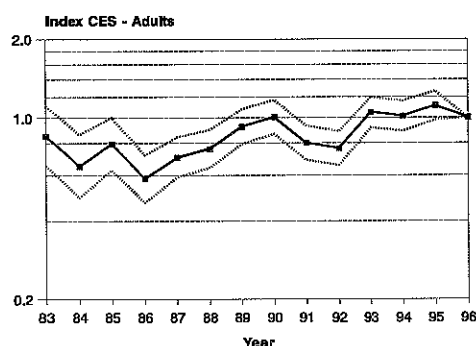
Table 3.80.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	+19	
CBC - Farmland	1972-96	+8	
CBC - Woodland	1972-96	+9	
BBS	1994-96	-7 n.s.	
CES - Adults	1983-96	+60 *	
CES - Juveniles	1983-96	+48 *	

Table 3.80.2: Productivity trends (NRS Data for 1996 unavailable, thus trends are for 1971-1995)

	Years	Change	Caveat
CES % - Juveniles	1983-96	+ve n.s.	
NRS - egg stage nest losses d ⁻¹	1971-95	-ve *	
NRS - young stage nest losses d ⁻¹	1971-95	+ve *	
NRS - egg-to-fledge nest losses d ⁻¹	1971-95	-ve *	
NRS - clutch size	1971-95	-ve n.s.	
NRS - brood size	1971-95	-ve n.s.	
NRS - laying date	1971-95	105 - 109 - 96 *	

Figure 3.80.2: Long-term trend from the Constant Effort Sites Scheme



3.81 MARSH TIT *Parus palustris* MEDIUM BTO ALERT

3.81.1 CONSERVATION IMPORTANCE

Table 4/Amber (25-50% Population decline)
Biodiversity Steering Group Conservation
Concern List

3.81.2 SPECIES SUMMARY

Marsh Tit population size and distribution has declined for unknown reasons (Gibbons *et al.* 1993), but this is unlikely to be due to changes in breeding performance, which has improved. The population declines on CBC plots warrants a Medium BTO Alert.

Figure 3.81.1:
Population trend from the Common Birds Census

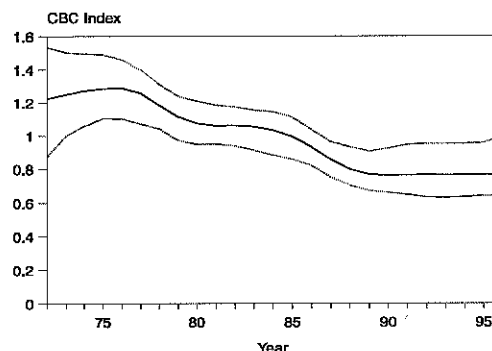


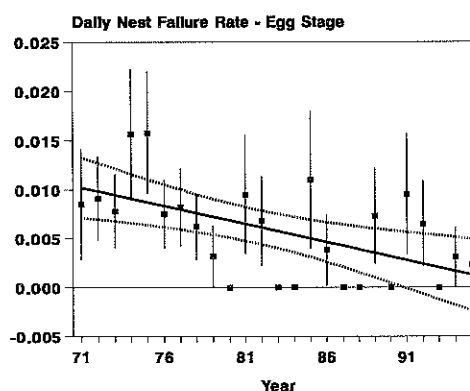
Table 3.81.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	-37	
CBC - Woodland	1972-96	-42	
BBS	1994-96	+35 *	

Table 3.81.2: Productivity trends (NRS Data for 1996 unavailable, thus trends are for 1971-1995)

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1971-95	-ve *	
NRS - young stage nest losses d ⁻¹	1971-95	-ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1971-95	-ve *	
NRS - clutch size	1971-95	-ve n.s.	
NRS - brood size	1971-95	+ve n.s.	
NRS - laying date	1971-95	-ve n.s.	

Figure 3.81.2: Long-term trend from the Nest Record Scheme



3.82.1 CONSERVATION IMPORTANCE

Table 4/Amber (25-50% Population decline)
Biodiversity Steering Group Conservation
Concern List

3.82.2 SPECIES SUMMARY

Willow Tit populations have declined in size and distribution, which may be linked to drainage of their preferred damp woodland habitats and to drier summers (Gibbons *et al.* 1993). The decline on CBC plots requires a High BTO Alert.

Figure 3.82.1:
Population trend from the Common Birds Census

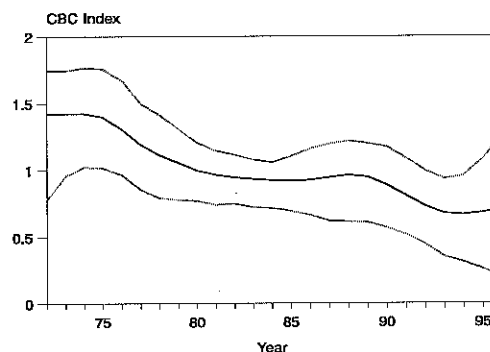


Table 3.82.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	-50	Small Sample (2, late)
BBS	1994-96	-19 n.s.	
CES-Adults	1983-96	-27 n.s.	
CES-Juveniles	1983-96	-31 n.s.	

3.83 COAL TIT *Parus ater*

3.83.1 CONSERVATION IMPORTANCE

Unlisted/Green
Biodiversity Steering Group Conservation
Concern List

3.83.2 SPECIES SUMMARY

Coal Tits appear less affected by cold winter weather than other small resident passerines and have tended to increase in population size overall.

Figure 3.83.1:
Population trend from the Common Birds Census

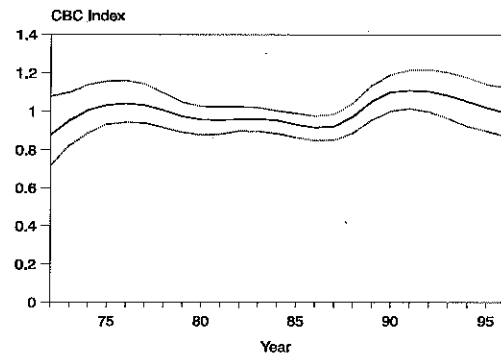


Table 3.83.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	+28	
CBC - Farmland	1972-96	+41	
CBC - Woodland	1972-96	+63	
BBS	1994-96	+31 *	

3.84 BLUE TIT *Parus caeruleus*

3.84.1 CONSERVATION IMPORTANCE

Unlisted/Green
Biodiversity Steering Group Conservation
Concern List

3.84.2 SPECIES SUMMARY

This very abundant species has shown a slight increase in population size. Its ability to utilize artificial food in gardens probably enables it to survive well in winter weather and its population varies relatively little between years.

Figure 3.84.1:
Population trend from the Common Birds Census

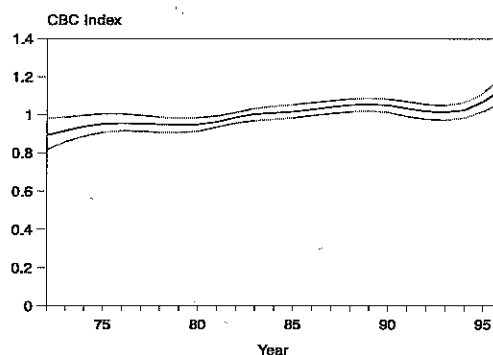


Table 3.84.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	+28	
CBC - Farmland	1972-96	+23	
CBC - Woodland	1972-96	+27	
BBS	1994-96	+22 *	
CES - Adults	1983-96	+9 n.s.	
CES - Juveniles	1983-96	-10 n.s.	

Table 3.84.2: Productivity trends

	Years	Change	Caveat
CES% - Juveniles	1983-96	-ve n.s.	

3.85 GREAT TIT *Parus major*

3.85.1 CONSERVATION IMPORTANCE

Unlisted/Green
Biodiversity Steering Group Conservation
Concern List

3.85.2 SPECIES SUMMARY

After increasing in population size in the late 1970s, populations have fluctuated about a steady level.

Figure 3.85.1:
Population trend from the Common Birds Census

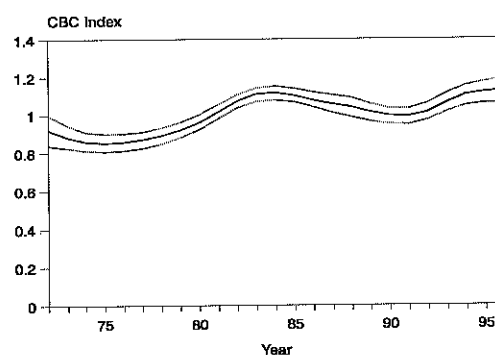


Table 3.85.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	+22	
CBC - Farmland	1972-96	+32	
CBC - Woodland	1972-96	+16	
BBS	1994-96	+13 *	
CES - Adults	1983-96	+6 n.s.	
CES - Juveniles	1983-96	+2 n.s.	

Table 3.85.2: Productivity trends

	Years	Change	Caveat
CES % - Juveniles	1983-96	-ve n.s.	

3.86 NUTHATCH *Sitta europaea*

3.86.1 CONSERVATION IMPORTANCE

Unlisted/Green
Biodiversity Steering Group Conservation
Concern List

3.86.2 SPECIES SUMMARY

Nuthatch populations have increased substantially and have spread into north England over the past 25 years (Gibbons *et al.* 1993). Average brood sizes have increased by nearly 2 young which may be a factor in its population spread. Average laying dates have become earlier and are perhaps being affected by climate change (Crick *et al.* 1997)

Figure 3.86.1:
Population trend from the Common Birds Census

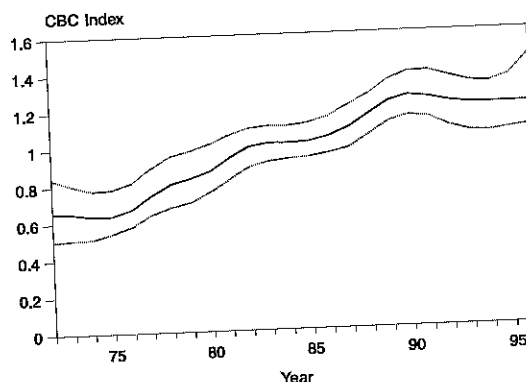


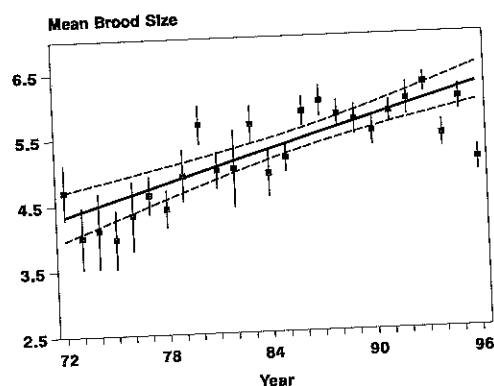
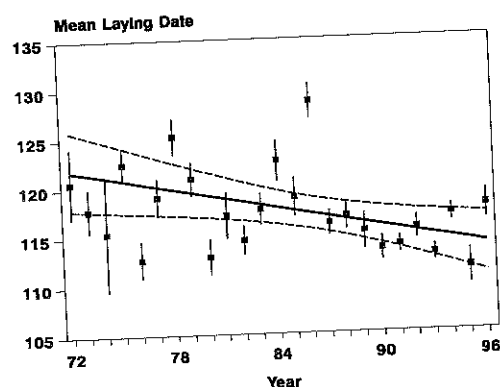
Table 3.86.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	+82	
CBC - Woodland	1972-96	+68	
BBS	1994-96	+35 *	

Table 3.86.2: Productivity trends

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1972-96	-ve	n.s.
NRS - young stage nest losses d ⁻¹	1972-96	-ve to +ve	*
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	-ve	n.s.
NRS - clutch size	1972-96	+ve	n.s.
NRS - brood size	1972-96	4.33 - 6.22	*
NRS - laying date	1972-96	122 - 114	*

Figure 3.86.2: Long-term trends from the Nest Record Scheme



3.87 TREECREEPER *Certhia familiaris*

3.87.1 CONSERVATION IMPORTANCE

Unlisted/Green
Biodiversity Steering Group Conservation
Concern List

3.87.2 SPECIES SUMMARY

Treecreeper numbers and survival rates are reduced by wet winters (Peach *et al.* 1995). Both CES and NRS indicate that breeding performance has generally increased.

Figure 3.87.1:
Population trend from the Common Birds Census

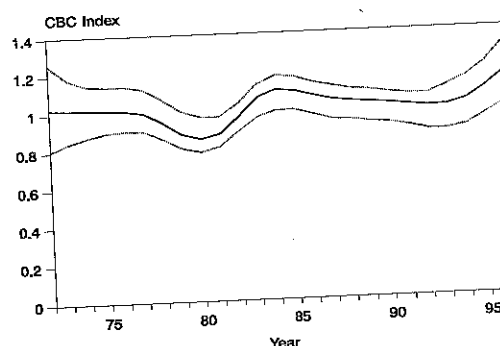


Table 3.87.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	+13	
CBC - Farmland	1972-96	-8	
CBC - Woodland	1972-96	+23	
BBS	1994-96	+24 *	
CES - Adults	1983-96	+31 n.s.	
CES - Juveniles	1983-96	+46 *	

Table 3.87.2: Productivity trends (NRS Data for 1996 unavailable, thus trends are for 1971-1995)

	Years	Change	Caveat
CES % - Juveniles	1983-96	+ve n.s.	
NRS - egg stage nest losses d ⁻¹	1971-95	-ve to +ve *	
NRS - young stage nest losses d ⁻¹	1971-95	-ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1971-95	-ve *	
NRS - clutch size	1971-95	-ve n.s.	
NRS - brood size	1971-95	4.18 - 4.63 - 4.30 *	
NRS - laying date	1971-95	-ve n.s.	

3.88 JAY *Garrulus glandarius*

3.88.1 CONSERVATION IMPORTANCE

Unlisted/Green

Biodiversity Steering Group: Unlisted

3.88.2 SPECIES SUMMARY

Jay populations have remained relatively stable in their preferred woodland habitat but have decreased on farmland, which is likely to be a sub-optimal habitat. The latter decrease may be linked to agricultural changes that have affected other bird populations.

Figure 3.88.1:
Population trend from the Common Birds Census

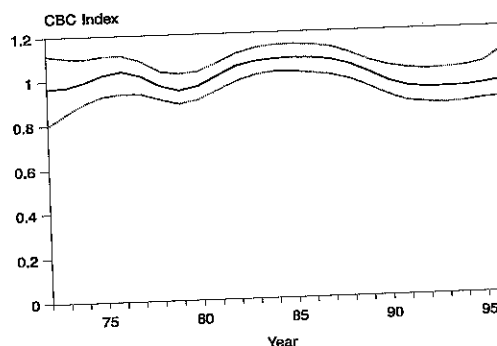


Table 3.88.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	-1	
CBC - Farmland	1972-96	-33	
CBC - Woodland	1972-96	+1	
BBS	1994-96	-9 n.s.	

3.89 MAGPIE *Pica pica*

3.89.1 CONSERVATION IMPORTANCE

Unlisted/Green
Biodiversity Steering Group: Unlisted

3.89.2 SPECIES SUMMARY

Magpie populations increased until the mid 1980s and have since been relatively stable. The increases have been linked to their spread into urban/suburban habitats and a decline in game-keeping (Marchant *et al.* 1990). There have been large increases in productivity over the period and average laying date has advanced by nearly three weeks, which may be linked to climate change or the shift in habitat use (Crick *et al.* 1997).

Figure 3.89.1:
Population trend from the Common Birds Census

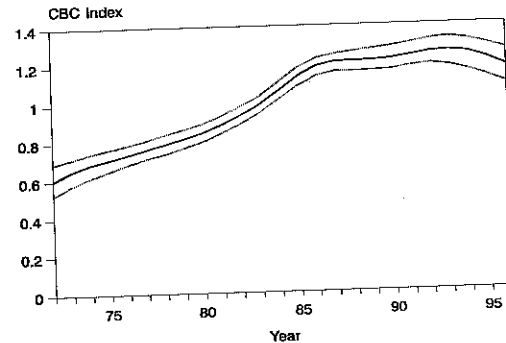


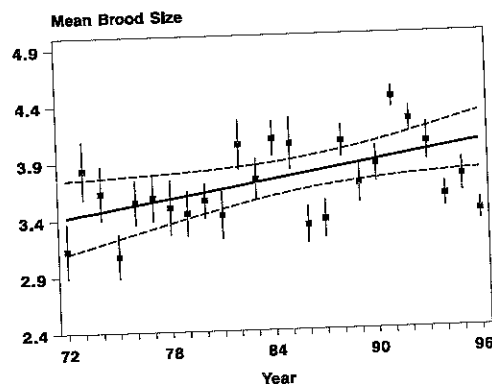
Table 3.89.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	+94	
CBC - Farmland	1972-96	+63	
CBC - Woodland	1972-96	+130	
BBS	1994-96	+1 n.s.	

Table 3.89.2: Productivity trends

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1972-96	-ve *	
NRS - young stage nest losses d ⁻¹	1972-96	-ve *	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	-ve *	
NRS - clutch size	1972-96	-ve n.s.	
NRS - brood size	1972-96	3.42 - 4.04 *	
NRS - laying date	1972-96	113 - 95 *	

Figure 3.89.2: Long-term trend from the Nest Record Scheme



3.90 JACKDAW *Corvus monedula*

3.90.1 CONSERVATION IMPORTANCE

Unlisted/Green
Biodiversity Steering Group: Unlisted

3.90.2 SPECIES SUMMARY

Populations in farmland have tended to remain steady after increases in the 1970s. Reasons for these increases are obscure but breeding performance has increased substantially over the period.

Figure 3.90.1:
Population trend from the Common Birds Census

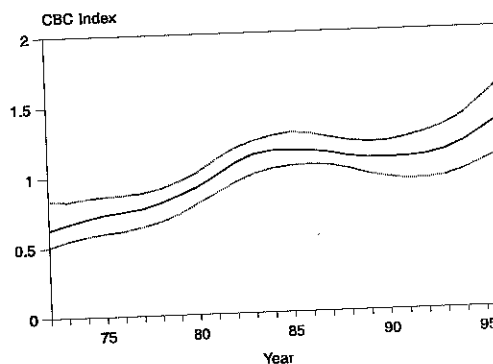


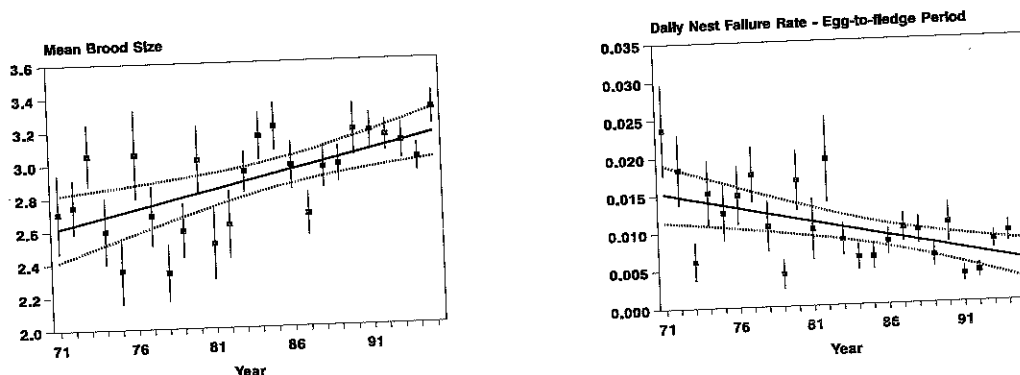
Table 3.90.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	+117	Small Sample (4, early)
CBC - Farmland	1972-96	+118	
CBC - Woodland	1972-96	+123	
BBS	1994-96	+5 n.s.	

Table 3.90.2: Productivity trends (NRS Data for 1996 unavailable, thus trends are for 1971-1995)

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1971-95	-ve n.s.	
NRS - young stage nest losses d ⁻¹	1971-95	-ve *	
NRS - egg-to-fledge nest losses d ⁻¹	1971-95	-ve *	
NRS - clutch size	1971-95	+ve n.s.	
NRS - brood size	1971-95	2.61 - 3.15 *	
NRS - laying date	1971-95	-ve n.s.	

Figure 3.90.2: Long-term trends from the Nest Record Scheme



3.91 ROOK *Corvus frugilegus*

3.91.1 CONSERVATION IMPORTANCE

Unlisted/Green

Biodiversity Steering Group: Unlisted

3.91.2 SPECIES SUMMARY

Rooks are not monitored routinely by CBC although population trends based on nest counts can be estimated from 20-30 plots and show a shallow increase with little between-year variation (Wilson *et al.* 1998). The species has been subject to periodic survey. Initial analyses of the latest survey in 1996 suggest that there has been an approximate increase in UK population of 40% since 1975 (Marchant *et al.* 1997). Over the past 25 years nesting success has tended to improve.

Table 3.91.1: Population trends

	Years	Change %	Caveat
BBS	1994-96	+8 n.s.	

Table 3.91.2: Productivity trends (NRS Data for 1996 unavailable, thus trends are for 1971-1995)

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1971-95	-ve n.s.	Small Sample
NRS - young stage nest losses d ⁻¹	1971-95	-ve *	
NRS - egg-to-fledge nest losses d ⁻¹	1971-95	-ve *	
NRS - clutch size	1971-95	3.48 - 3.81 - 3.03 *	
NRS - brood size	1971-95	+ve n.s.	
NRS - laying date	1971-95	-ve n.s.	

3.92 CARRION CROW *Corvus corone*

3.92.1 CONSERVATION IMPORTANCE

Unlisted/Green

Biodiversity Steering Group: Unlisted

3.92.2 SPECIES SUMMARY

Carrion Crow populations have shown steady increases which are thought to be linked to declining game-keeping interests (Marchant *et al.* 1990). Nesting success has improved and there is a trend towards earlier average laying dates which may be linked to climate change (Crick *et al.* 1997).

Figure 3.92.1:
Population trend from the Common Birds Census

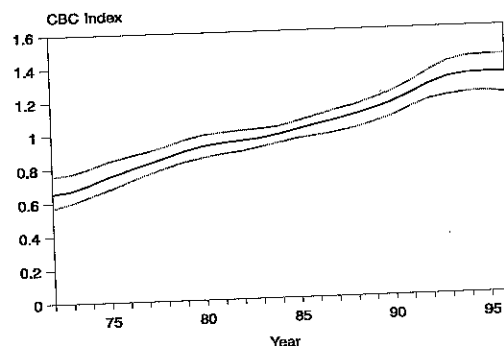


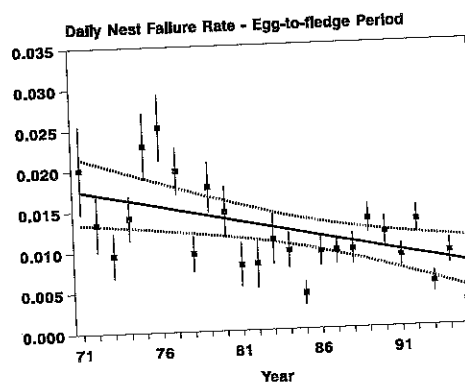
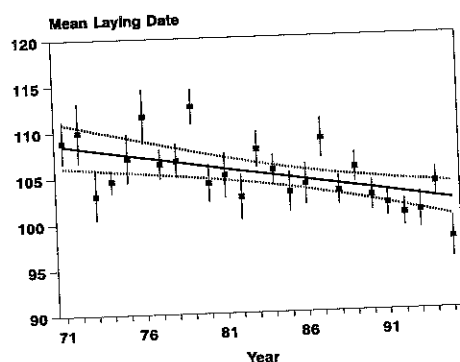
Table 3.92.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	+101	
CBC - Farmland	1972-96	+75	
CBC - Woodland	1972-96	+106	
BBS	1994-96	-1 n.s.	

Table 3.92.2: Productivity trends (NRS Data for 1996 unavailable, thus trends are for 1971-1995)

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1971-95	-ve n.s.	
NRS - young stage nest losses d ⁻¹	1971-95	-ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1971-95	-ve *	
NRS - clutch size	1971-95	-ve n.s.	
NRS - brood size	1971-95	+ve n.s.	
NRS - laying date	1971-95	108 - 102 *	

Figure 3.92.2: Long-term trends from the Nest Record Scheme



3.93.1 CONSERVATION IMPORTANCE

Unlisted/Green

Biodiversity Steering Group: Unlisted

3.93.2 SPECIES SUMMARY

Raven populations have decreased in Scotland and northern England (Gibbons *et al.* 1993) and distributional gaps are linked to grouse moor gamekeeping interests (Gibbons *et al.* 1995). Brood sizes have declined significantly and nest failures are higher than they were in the 1970s. The declines in breeding performance warrant a Medium BTO Alert.

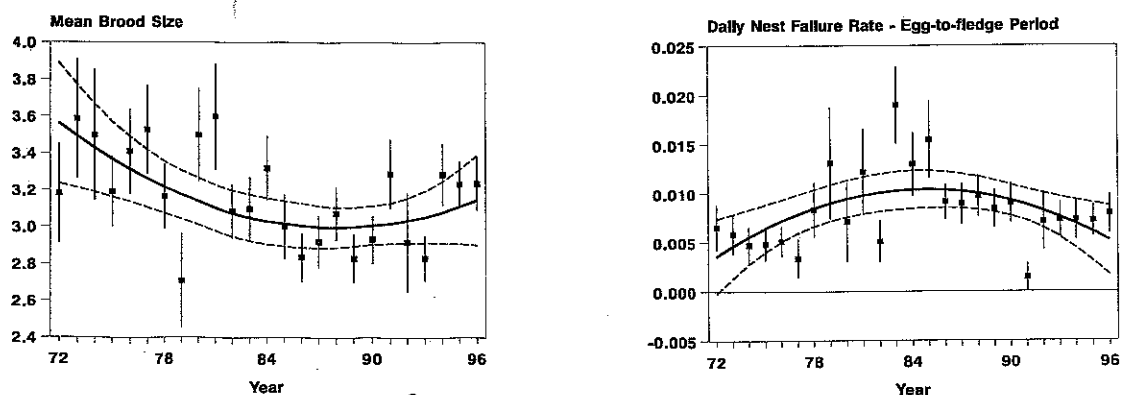
Table 3.93.1: Population trends

	Years	Change %	Caveat
BBS	1994-96	+33 *	

Table 3.93.2: Productivity trends

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1972-96	+ve n.s.	
NRS - young stage nest losses d ⁻¹	1972-96	+ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	+ve to -ve *	
NRS - clutch size	1972-96	-ve n.s.	
NRS - brood size	1972-96	3.56 - 3.00 - 3.14 *	
NRS - laying date	1972-96	-ve n.s.	

Figure 3.93.2: Long-term trends from the Nest Record Scheme



3.94 STARLING *Sturnus vulgaris* MEDIUM BTO ALERT

3.94.1 CONSERVATION IMPORTANCE

Table 4/Amber (25-50% Population decline)
Biodiversity Steering Group: Unlisted

3.94.2 SPECIES SUMMARY

Populations of Starling have declined substantially, especially in woodland, since the early 1980s warranting a Medium BTO Alert. Their preferred feeding habitat is permanent pasture, much of which has been lost, particularly in south and east England (Gibbons *et al.* 1993). The Nest Record Scheme shows improvements in breeding success, so it is possible that changes in survival have affected population size.

Figure 3.94.1:
Population trend from the Common Birds Census

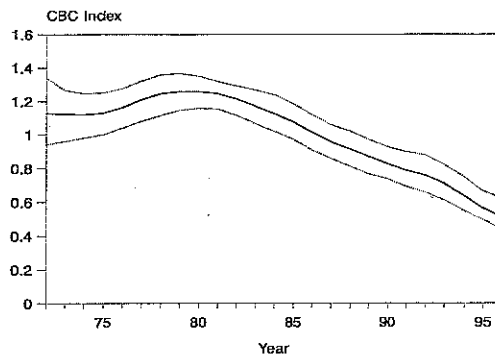


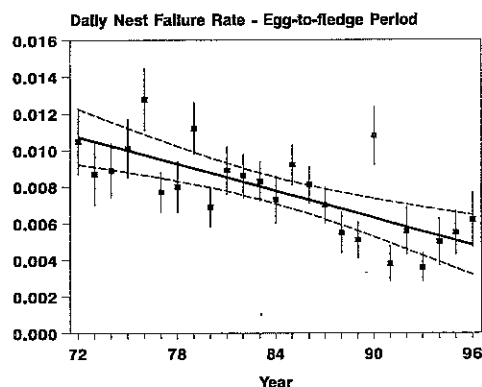
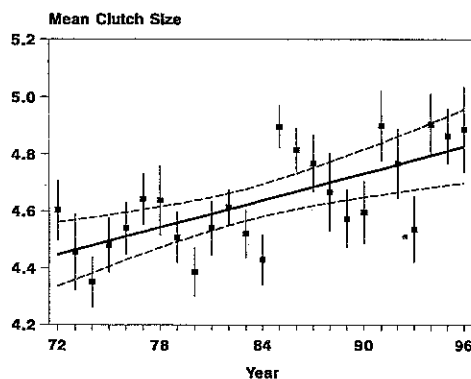
Table 3.94.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	-45	
CBC - Farmland	1972-96	-32	
CBC - Woodland	1972-96	-77	
BBS	1994-96	+1 n.s.	

Table 3.94.2: Productivity trends

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1972-96	-ve *	
NRS - young stage nest losses d ⁻¹	1972-96	-ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	-ve *	
NRS - clutch size	1972-96	4.44 - 4.83 *	
NRS - brood size	1972-96	3.06 - 3.93 *	
NRS - laying date	1972-96	113 - 118 - 112 *	

Figure 3.94.2: Long-term trends from the Nest Record Scheme



3.95 HOUSE SPARROW *Passer domesticus* HIGH BTO ALERT

3.95.1 CONSERVATION IMPORTANCE

Unlisted/Green

Biodiversity Steering Group: Unlisted

3.95.2 SPECIES SUMMARY

This colonial and flocking species is monitored poorly by CBC but its indication of decline has been echoed by other studies. In particular, trends from the BTO's Garden Bird Feeding Survey also show substantial declines, measured in more typical suburban habitats (Glue 1994). Possible reasons for decline include loss of food supplies through biocide usage, loss of winter stubbles and increased cat predation (Gibbons *et al.* 1993).

Figure 3.95.1:
Population trend from the Common Birds Census

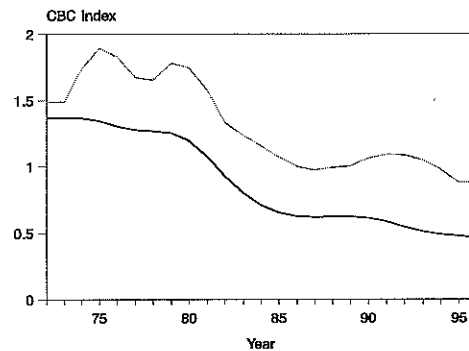


Table 3.95.1: Population trends

	Years	Change %	Caveat
CBC-all	1972-96	-64	Small Sample (5, early)
BBS	1994-96	+1 n.s.	

3.96 TREE SPARROW *Passer montanus* HIGH BTO ALERT

3.96.1 CONSERVATION IMPORTANCE

Table 3/Red (>50% Population decline)
Biodiversity Steering Group Priority Species List

3.96.2 SPECIES SUMMARY

Tree Sparrow populations have crashed since the late 1970s, requiring a High BTO Alert with range contractions in south-west England, west Wales, northern England and Scotland (Gibbons *et al.* 1993). The reasons for the decline are unknown but may be a feature of a medium-term rise and fall in Tree Sparrow numbers (Summers-Smith 1995). The changes are unlikely to be linked to breeding performance as this has tended to improve.

Figure 3.96.1:
Population trend from the Common Birds Census

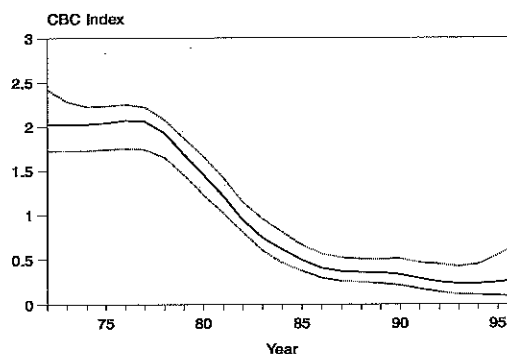


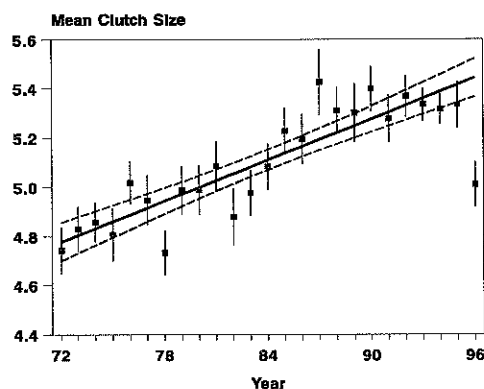
Table 3.96.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	-87	Small Sample (1, late)
CBC - Farmland	1972-96	-76	Small Sample (3,late)
BBS	1994-96	+15 n.s.	

Table 3.96.2: Productivity trends

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1972-96	-ve n.s.	
NRS - young stage nest losses d ⁻¹	1972-96	-ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	-ve n.s.	
NRS - clutch size	1972-96	4.77 - 5.44 *	
NRS - brood size	1972-96	3.75 - 4.57 *	
NRS - laying date	1972-96	+ve n.s.	

Figure 3.96.2: Long-term trend from the Nest Record Scheme



3.97 CHAFFINCH *Fringilla coelebs*

3.97.1 CONSERVATION IMPORTANCE

Unlisted/Green

Biodiversity Steering Group: Unlisted

3.97.2 SPECIES SUMMARY

Chaffinch populations have gradually increased over the past 25 years, as shown by both CBC and CES, contrasting with many of the other seed-eating finches. Breeding performance has tended to improve over the period.

Figure 3.97.1:
Population trend from the Common Birds Census

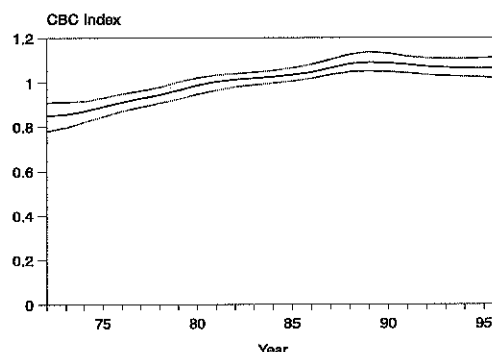


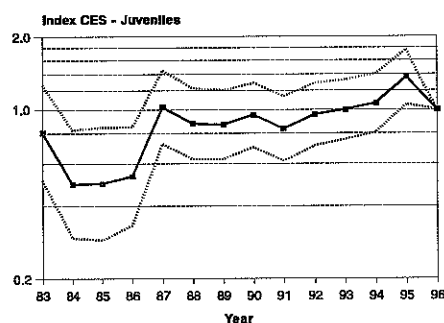
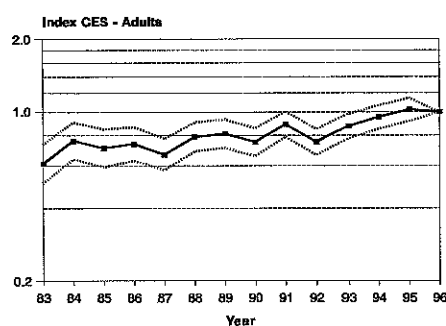
Table 3.97.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	+25	
CBC - Farmland	1972-96	+27	
CBC - Woodland	1972-96	+23	
BBS	1994-96	+6 *	
CES - Adults	1983-96	+57 *	
CES - Juveniles	1983-96	+80 *	

Table 3.97.2: Productivity trends

	Years	Change	Caveat
CES % - Juveniles	1983-96	+ve n.s.	
NRS - egg stage nest losses d ⁻¹	1972-96	-ve to +ve *	
NRS - young stage nest losses d ⁻¹	1972-96	-ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	+ve to -ve *	
NRS - clutch size	1972-96	+ve n.s.	
NRS - brood size	1972-96	+ve n.s.	
NRS - laying date	1972-96	-ve n.s.	

Figure 3.97.2: Long-term trends from the Constant Effort Sites Scheme



3.98 GREENFINCH *Carduelis chloris* MEDIUM BTO ALERT

3.98.1 CONSERVATION IMPORTANCE

Unlisted/Green
Biodiversity Steering Group Conservation
Concern List

3.98.2 SPECIES SUMMARY

Greenfinch populations have been relatively stable over the past 25 years. However, the Nest Record Scheme provides evidence for increasing nest failures in the 1990s which may foreshadow a future population decline (Crick *et al.* 1996b), hence the Medium BTO Alert.

Figure 3.98.1:
Population trend from the Common Birds Census

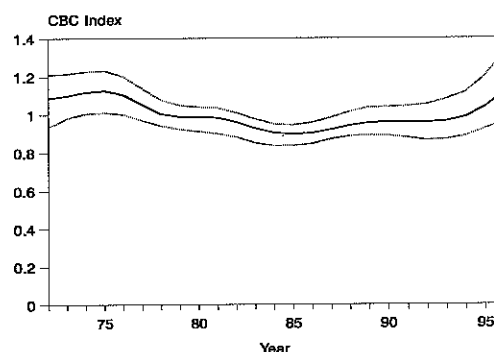


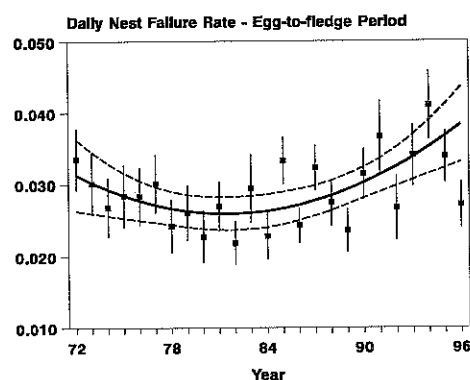
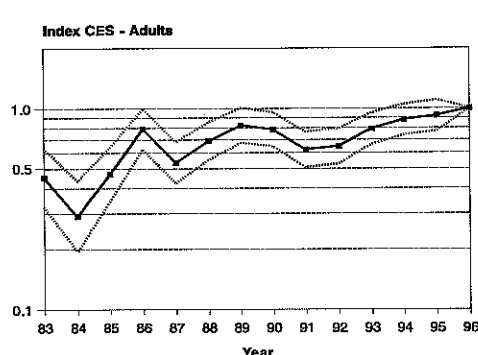
Table 3.98.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	+3	
CBC - Farmland	1972-96	+19	
CBC - Woodland	1972-96	-11	
BBS	1994-96	+8 *	
CES - Adults	1983-96	+93 *	
CES - Juveniles	1983-96	-36 n.s.	

Table 3.98.2: Productivity trends

	Years	Change	Caveat
CES % - Juveniles	1983-96	-ve n.s.	
NRS - egg stage nest losses d ⁻¹	1972-96	-ve to +ve *	
NRS - young stage nest losses d ⁻¹	1972-96	+ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	-ve to +ve *	
NRS - clutch size	1972-96	-ve n.s.	
NRS - brood size	1972-96	-ve n.s.	
NRS - laying date	1972-96	-ve n.s.	

Figure 3.98.2: Long-term trends from the Constant Effort Sites and Nest Record Schemes



3.99.1 CONSERVATION IMPORTANCE

Table 4/Amber (25-50% Population decline)
Biodiversity Steering Group Conservation
Concern List

3.99.2 SPECIES SUMMARY

The majority of Goldfinches move to France, Belgium and Spain in winter and population fluctuations are likely to be dependent on conditions there (Gibbons *et al.* 1993). Although it suffered after the cold winter of 1985/86, the population appears now to have recovered.

Figure 3.99.1:
Population trend from the Common Birds Census

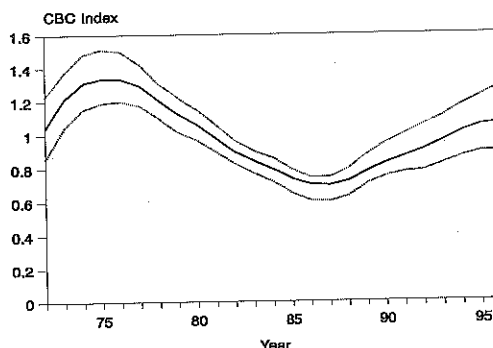


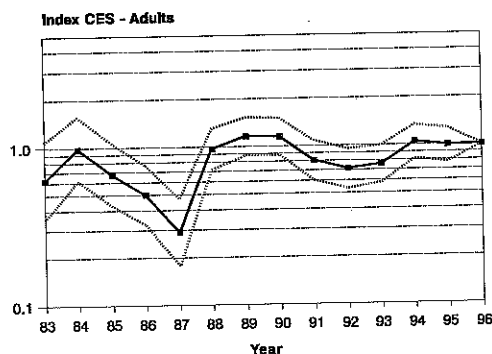
Table 3.99.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	+2	
CBC - Farmland	1972-96	+18	
BBS	1994-96	+7 n.s.	
CES - Adults	1983-96	+45 n.s.	
CES - Juveniles	1983-96	-59 *	

Table 3.99.2: Productivity trends (NRS Data for 1996 unavailable, thus trends are for 1971-1995)

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1971-95	+ve n.s.	
NRS - young stage nest losses d ⁻¹	1971-95	+ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1971-95	+ve n.s.	
NRS - clutch size	1971-95	+ve n.s.	
NRS - brood size	1971-95	+ve n.s.	
NRS - laying date	1971-95	-ve n.s.	

Figure 3.99.2: Long-term trend from the Constant Effort Sites Scheme



3.100 LINNET *Carduelis cannabina* MEDIUM BTO ALERT

3.100 CONSERVATION IMPORTANCE

Table 3/Red (>50% Population decline)
Biodiversity Steering Group Priority Species List

3.100.2 SPECIES SUMMARY

Linnet populations underwent a large decline from the mid 1970s to mid 1980s and have since shown signs of recovery (Medium BTO Alert), however declines in scrub habitats (CES) appear to be continuing. Declines have been linked to loss of weed seed food supplies due to herbicides and it is possible that recovery might be a beneficial effect of set-aside. Trends in nest failure rates mirror the CBC population trends, suggesting a casual link between the two.

Figure 3.100.1:
Population trend from the Common Birds Census

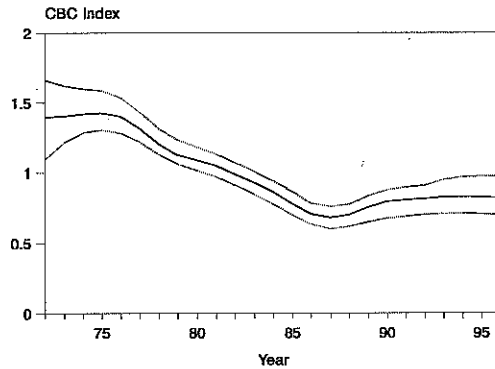


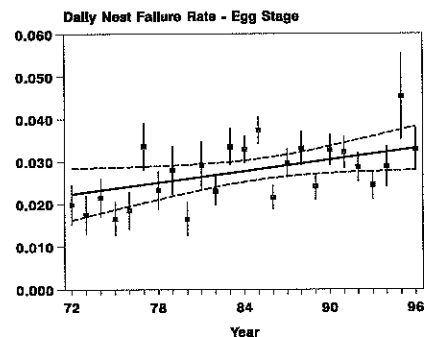
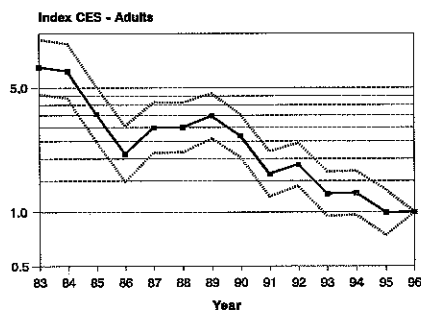
Table 3.100.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	-41	Small Sample (10, throughout)
CBC - Farmland	1972-96	-40	
CBC - Woodland	1972-96	-30	
BBS	1994-96	-3 n.s.	
CES - Adults	1983-96	-83 *	
CES - Juveniles	1983-96	-91 *	

Table 3.100.2: Productivity trends

	Years	Change	Caveat
CES % - Juveniles	1983-96	+ve *	
NRS - egg stage nest losses d ⁻¹	1972-96	+ve *	
NRS - young stage nest losses d ⁻¹	1972-96	+ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	+ve to -ve *	
NRS - clutch size	1972-96	-ve n.s.	
NRS - brood size	1972-96	4.07 - 4.36 *	
NRS - laying date	1972-96	+ve n.s.	

Figure 3.100.2: Long-term trends from the Constant Effort Sites and Nest Record Schemes



3.101.1 CONSERVATION IMPORTANCE

Table 4/Red (Historical decline)
Biodiversity Steering Group Conservation
Concern List

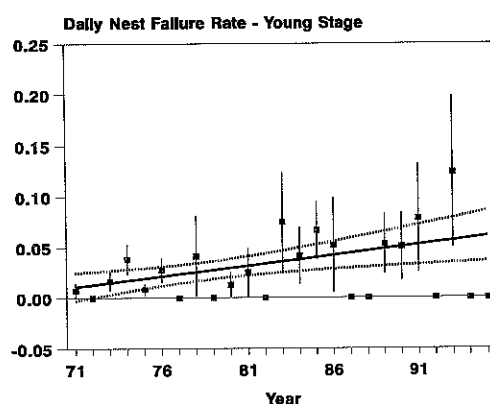
3.101.2 SPECIES SUMMARY

Twite populations are not monitored annually but have undergone a long-term historical decline, probably due to habitat loss through moorland degradation and agricultural reclamation (Gibbons *et al.* 1993). Breeding performance has tended to decline (Medium BTO Alert) and this has been linked to the increased use of less productive grassland for nesting as heather moorland has been degraded (Brown *et al.* 1995).

Table 3.101.2: Productivity trends (NRS Data for 1996 unavailable, thus trends are for 1971-1995)

	Years	Change		Caveat
NRS - egg stage nest losses d ⁻¹	1971-95	-ve	n.s.	
NRS - young stage nest losses d ⁻¹	1971-95	+ve	*	
NRS - egg-to-fledge nest losses d ⁻¹	1971-95	+ve	n.s.	
NRS - clutch size	1971-95	-ve	n.s.	Small Sample
NRS - brood size	1971-95	-ve	n.s.	Small Sample
NRS - laying date	1971-95	-ve	n.s.	Small Sample

Figure 3.101.2: Long-term trend from the Nest Record Scheme



3.102.1 CONSERVATION IMPORTANCE

Unlisted/Green
Biodiversity Steering Group Conservation
Concern List

3.102.2 SPECIES SUMMARY

Redpoll underwent a substantial range contraction between the breeding atlases (Gibbons *et al.* 1993) and, although not representative of the centres of Redpoll populations, the CBC and CES have recorded large population declines (High BTO Alert). Breeding performance has not changed substantially, so the declines are likely to be due to habitat loss or declines in survival.

Figure 3.102.1:
Population trend from the Common Birds Census

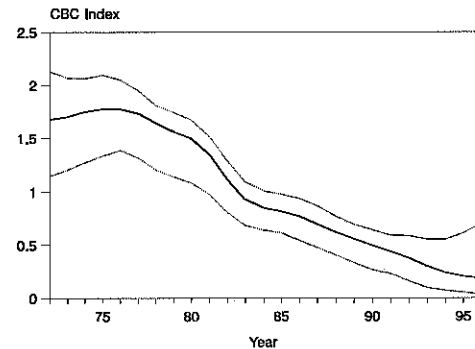


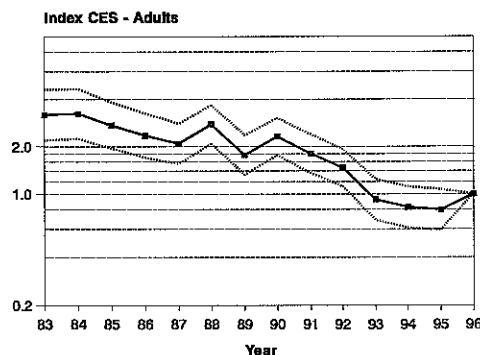
Table 3.102.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	-89	Low Densities & Small Sample (4, late)
BBS	1994-96	+16 n.s.	
CES - Adults	1983-96	-76 *	
CES - Juveniles	1983-96	-79 *	

Table 3.102.2: Productivity trends (NRS Data for 1996 unavailable, thus trends are for 1971-1995)

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1971-95	-ve n.s.	
NRS - young stage nest losses d ⁻¹	1971-95	+ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1971-95	-ve n.s.	
NRS - clutch size	1971-95	+ve n.s.	
NRS - brood size	1971-95	3.68 - 4.17 - 3.64 *	
NRS - laying date	1971-95	+ve n.s.	

Figure 3.102.2: Long-term trend from the Constant Effort Sites Scheme



3.103 BULLFINCH *Pyrrhula pyrrhula* HIGH BTO ALERT

3.103.1 CONSERVATION IMPORTANCE

Table 3/Red (50% Population decline)
Biodiversity Steering Group Priority Species List

3.103.2 SPECIES SUMMARY

Bullfinch populations on CBC plots declined strongly in the late 1970s requiring a High BTO Alert and have been relatively stable since then, although CES provides evidence for recent decline. Although brood sizes tended to decline in the 1990s, nest failure rates have improved. It is unclear why populations have declined, but agricultural intensification may provide a cause (Marchant *et al.* 1990).

Figure 3.103.1:
Population trend from the Common Birds Census

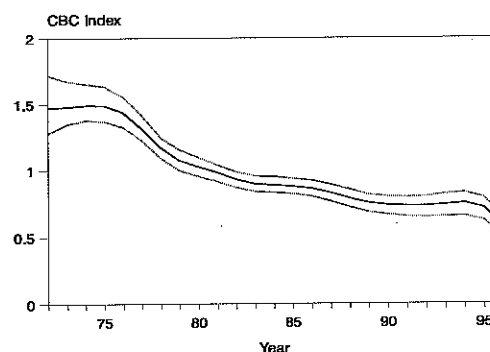


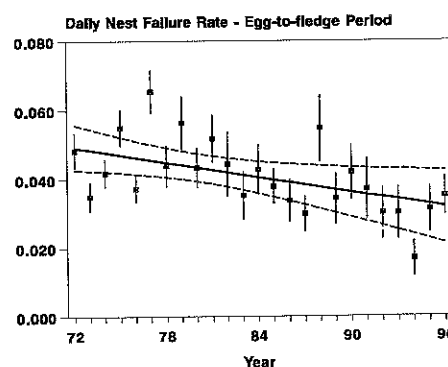
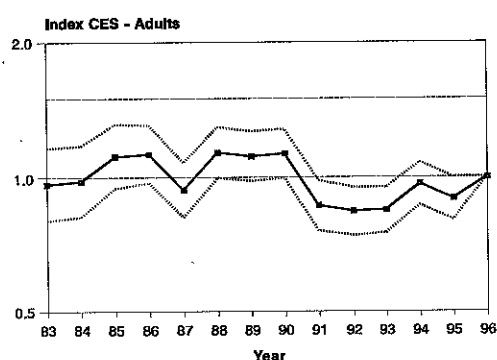
Table 3.103.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	-62	
CBC - Farmland	1972-96	-62	
CBC - Woodland	1972-96	-36	
BBS	1994-96	+19 *	
CES - Adults	1983-96	-16 *	
CES - Juveniles	1983-96	-2 n.s.	

Table 3.103.2: Productivity trends

	Years	Change	Caveat
CES % - Juveniles	1983-96	+ve n.s.	
NRS - egg stage nest losses d ⁻¹	1972-96	-ve n.s.	
NRS - young stage nest losses d ⁻¹	1972-96	-ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	-ve *	
NRS - clutch size	1972-96	+ve n.s.	
NRS - brood size	1972-96	-ve n.s.	
NRS - laying date	1972-96	-ve n.s.	

Figure 3.103.2: Long-term trends from the Constant Effort Sites and Nest Record Schemes



3.104.1 CONSERVATION IMPORTANCE

Unlisted/Green
Biodiversity Steering Group Conservation
Concern List

3.104.2 SPECIES SUMMARY

Yellowhammer populations have declined more recently than other seed-eating passerines but now require a High BTO Alert. This may be linked to loss of food supplies due to loss of stubbles and increased biocide use. Breeding performance has tended to improve, so changes in survival rates are a more likely cause of the population decline.

Figure 3.104.1:
Population trend from the Common Birds Census

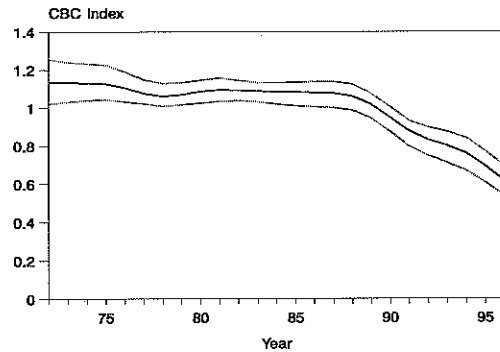


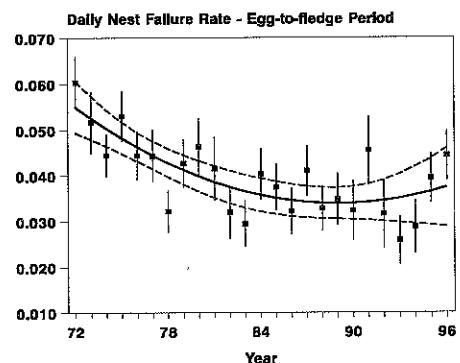
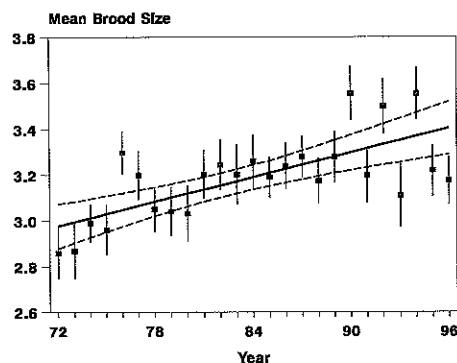
Table 3.104.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	-60	
CBC-Farmland	1972-96	-37	
CBC - Woodland	1972-96	-71	
BBS	1994-96	-7 *	
CES - Adults	1983-96	-25 n.s.	
CES - Juveniles	1983-96	-74 *	

Table 3.104.2: Productivity trends

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1972-96	-ve to +ve *	
NRS - young stage nest losses d ⁻¹	1972-96	-ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	-ve to +ve *	
NRS - clutch size	1972-96	3.36 - 3.62 *	
NRS - brood size	1972-96	2.97 - 3.40 *	
NRS - laying date	1972-96	-ve n.s.	

Figure 3.104.2: Long-term trends from the Nest Record Scheme



3.105 REED BUNTING *Emberiza schoeniclus* HIGH BTO ALERT

3.105.1 CONSERVATION IMPORTANCE

Table 3/Red (>50% Population decline)
Biodiversity Steering Group Priority Species List

3.105.2 SPECIES SUMMARY

Reed Bunting populations declined in both their dry and wet habitats in the late 1970s, and the CES suggests this has continued. Population declines have been linked to increased herbicide use (Gibbons *et al.* 1993) and require a High BTO Alert. Detailed analysis shows that declining survival rates are sufficient to have caused the population declines (Peach *et al.* unpubl.)

Figure 3.105.1:
Population trend from the Common Birds Census

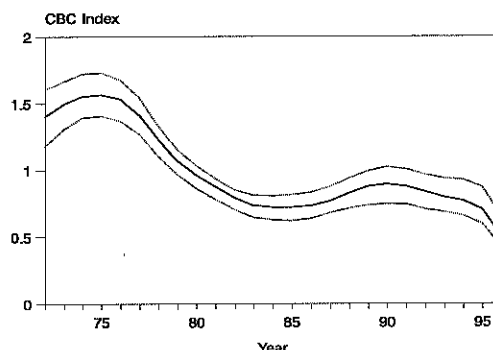


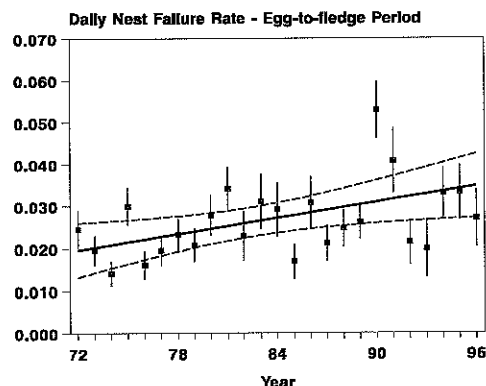
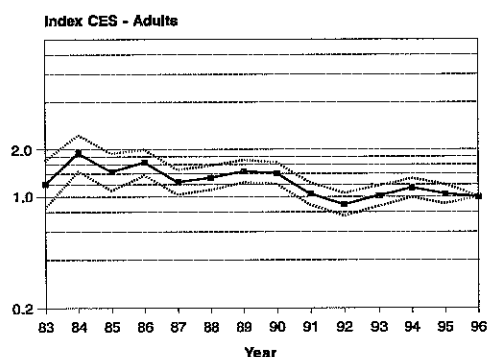
Table 3.105.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	-64	
CBC - Farmland	1972-96	-40	
WBS	1974-96	-54	
BBS	1994-96	-11 n.s.	
CES - Adults	1983-96	-42 *	
CES - Juveniles	1983-96	-62 *	

Table 3.105.2: Productivity trends

	Years	Change	Caveat
CES % - Juveniles	1983-96	+ve n.s.	
NRS - egg stage nest losses d ⁻¹	1972-96	+ve *	
NRS - young stage nest losses d ⁻¹	1972-96	+ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1972-96	+ve *	
NRS - clutch size	1972-96	+ve n.s.	
NRS - brood size	1972-96	+ve n.s.	
NRS - laying date	1972-96	-ve n.s.	

Figure 3.105.2: Long-term trends from the Constant Effort Sites and Nest Record Schemes



3.106 CORN BUNTING *Miliaria calandra* HIGH BTO ALERT

3.106.1 CONSERVATION IMPORTANCE

Table 2/Red (>50% Population decline)
Biodiversity Steering Group Priority Species List

3.106.2 SPECIES SUMMARY

Populations of Corn Bunting crashed during the 1980s, requiring a High BTO Alert. This has been blamed on loss of weedy stubbles as a winter feeding habitat (Donald 1997). Over this time, breeding performance has improved, and so the causes of decline are likely to be poor survival and/or habitat loss (Crick 1997).

Figure 3.106.1:
Population trend from the Common Birds Census

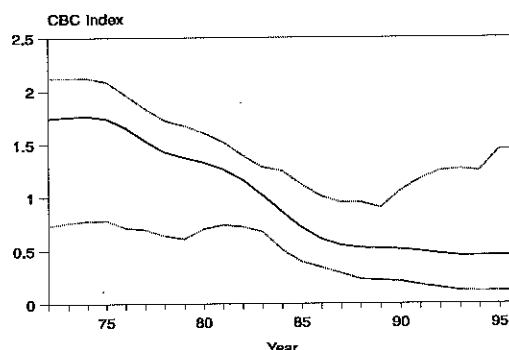


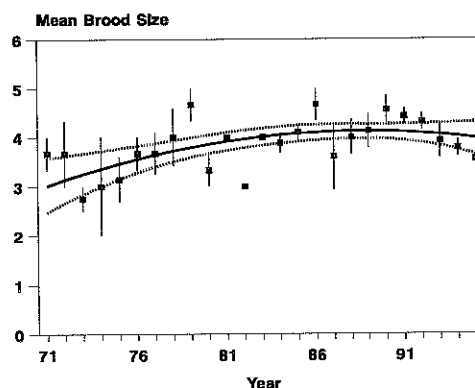
Table 3.106.1: Population trends

	Years	Change %	Caveat
CBC - all	1972-96	-74	Small Sample (11, late)
BBS	1994-96	-21 *	

Table 3.106.2: Productivity trends (NRS Data for 1996 unavailable, thus trends are for 1971-1995)

	Years	Change	Caveat
NRS - egg stage nest losses d ⁻¹	1971-95	-ve n.s.	Small Sample
NRS - young stage nest losses d ⁻¹	1971-95	+ve n.s.	
NRS - egg-to-fledge nest losses d ⁻¹	1971-95	-ve n.s.	
NRS - clutch size	1971-95	+ve n.s.	
NRS - brood size	1971-95	3.01 - 4.12 - 3.96 *	
NRS - laying date	1971-95	185 - 164 *	

Fig 3.106.2: Long-term trend from the Nest Record Scheme



4. DISCUSSION

4.1 BTO Alerts

One of the main aims of this report is to provide early warning alerts to JNCC and Country Agencies about worrying declines in population size or reproductive success, with special reference to species on the *Conservation Importance List*. We have used criteria similar to those used in the drawing up of the *Conservation Importance List*, the *Biodiversity Steering Group Lists* and the *List of Birds of Conservation Concern*, but have been less conservative in some respects.

Although the data for some species may be unrepresentative of the UK as a whole, due to factors such as relatively small sample sizes or because monitoring takes place only on plots containing relatively low or high densities of a species, the results presented here are often the only information available for a species and they at least show what is happening in the areas that are monitored. If conservationists are not alerted to the fact that, say, Tawny Owls have declined by 33% over the last 25 years on CBC plots, the BTO would be failing in its duty and the conservationists would not be able to use this piece of information in their planning. It alerts the conservationists that there is the distinct possibility that Tawny Owl, a top predator and potential indicator species, is being affected detrimentally by some environmental change.

Similarly, we are able to include demographic factors within our alerts, mainly concerning breeding performance but also, when available, survival rates. These can be used to enhance our understanding why a particular change in population status has occurred. They can also provide early warning of impending changes in population size, in the absence of definitive information on population size or before such changes have occurred (see section 1.1).

4.1.1 High BTO Alerts

High BTO Alerts are given for species which have shown a population decline of at least 50% over the past 25 years (or over the duration of the WBS or CES) or for species with large declines in breeding performance or survival. Twenty High BTO Alerts are given in this report (Table 4.1.1).

Grey Partridge, Turtle Dove, Skylark, Song Thrush, Spotted Flycatcher, Tree Sparrow, Bullfinch, Reed Bunting and Corn Bunting: for these nine species, the High BTO Alerts represent no change in status for species currently listed on Tables 2 & 3 of the *Conservation Importance List* or the Red List of *Birds of Conservation Concern*. These species are the subject of active research programmes by a wide range of conservation and research organisations. For Reed Bunting, there have been significant declines in breeding performance as well as in population size, but the former are not related to the latter, although they could be depressing population recovery. For Song Thrush, detailed analysis of BTO datasets has shown that a decline in first-year survival rates is sufficient to explain most of the population decline (Thomson *et al.* 1997), this information will be important in guiding future conservation work on this species.

Yellowhammer, previously unlisted, now warrants being included on the lists of conservation importance because it has declined in population size by >50%. Yellowhammer is the third bunting to join the list of declining farmland seed-eaters for which there is cause for concern. Considerable research is being directed at the problem of declining seed-eaters, and it appears that multiple factors are affecting their populations, although loss of winter and spring food supplies may be particularly important.

Goldcrest, also previously unlisted, now warrants being included on the lists of conservation importance because it has declined in population size by >50%. Although this might be viewed with some scepticism because its population is subject to large annual variations due to the weather, its smoothed population trend shows a sustained decrease which contrasts strongly with recoveries shown by two other small-bodied resident insectivores, Wren and Long-tailed Tit. However, it should be noted that the CBC monitors relatively few pure conifer woods, and that most Goldcrests are recorded in relatively small numbers on plots that consist mainly of non-conifer habitats.

Willow Tit is currently on the Amber List, but its population decline is now 50% and would justify its inclusion on the Red List. The reasons for its decline are unclear but may be linked to drainage of their preferred damp woodlands and to drier summers (Gibbons *et al.* 1993).

For the other seven species, CBC plots may not be representative for the bulk of their populations but the declines are severe and deserve consideration:

Redshank is listed as having medium conservation importance because of its European population status. The CBC suggests that a large population decline has occurred over the last 25 years, although it must be noted that the CBC plots may not be representative for this species in the UK. However there is considerable concern about the status of breeding waders, including Redshank, Snipe and Curlew, on lowland wetlands and in more upland areas (Brown & Grice 1993, Robson *et al.* 1995, Shrubb *et al.* 1997).

Snipe is currently Amber-listed on the basis of moderate breeding decline, but its population on CBC plots has collapsed over the recent 25 years. Again, CBC plots may not adequately represent its distribution, but the severity of the CBC decline indicates that the species deserves conservation attention.

House Sparrow is poorly monitored by the CBC because it has a strong urban component to its population and its colonial and flocking habits are unsuited to territory mapping. However, its population decline is also evident in suburban gardens, a more typical habitat, (Glue 1994) and is nearly as severe as that shown by Tree Sparrow. Loss of winter food supplies and the impact of cat predation have been implicated in its decline.

Two nocturnal or crepuscular species show worrying declines, although it must be noted that the CBC is a suboptimal scheme for monitoring such species. The decline of the **Woodcock** is giving cause for concern, especially to game shooting interests (Hoodless 1994). Similarly, the **Grasshopper Warbler** has declined enormously on CBC plots. Analysis of Nest Record Cards

has shown that it has the potential to reproduce rapidly (Glue 1990) but very little is known about this species' requirements and about its migratory habits.

The last three species are all woodland specialists. Lowland populations of **Tree Pipit** may be peripheral to the main part of the species' distribution, but its recent severe decline is both important in itself and as a potential indicator of changes in the largely unmonitored parts of its range. **Lesser Spotted Woodpecker** occurs on a relatively small number of CBC plots but its decline is serious and links to the clearance of dead elms are only speculative. Finally, **Redpoll** is unusual in being a declining seed-eater that is more of a woodland species than a farmland one. It declined substantially on CBC and CES plots, although both schemes are unrepresentative of the centres of its distribution in the UK. The reasons for its decline are unclear but it has undergone a substantial range contraction over the past 25 years and its ecology needs to be investigated in detail.

4.1.2 Medium BTO Alerts

Medium BTO Alerts are given for species which have shown a population decline of between 25 and 49% over the past 25 years (or over the duration of the WBS or CES) or for species with significant declines in breeding performance or survival. Twenty Medium BTO Alerts are given in this report (Table 4.1.2).

Dunnock, Blackbird, Marsh Tit and Starling: for these four species, the Medium BTO Alerts represent no change in status for species currently listed on Table 4 of the *Conservation Importance List* or the Amber List of *Birds of Conservation Concern*.

Linnet was given high conservation importance due to a population decline of more than 50% but it now shows signs of recovery such that its long-term decline is now just less than 50%, only requiring a Medium BTO Alert. Long-term changes in breeding performance appear to be related to its population changes and this is currently part of an active research project at the BTO.

Lapwing is currently of medium conservation importance because of the size of its wintering population, but it has experienced large changes in its breeding distribution and is thought to be suffering from changes in the farmland environment, such as the decline in mixed farming and the switch to autumn-sown cereals (Hudson *et al.* 1994). Peach *et al.* (1994) suggest that the declines may be due to declines in productivity (nestling survival rates) because neither adult nor first year survival rates show long-term trends.

Twite is currently listed as having high conservation importance because of a historical decline in population size. Nest Record Scheme data suggest that breeding performance has declined. Collaborative work between BTO and English Nature suggests that the declines may be due to changes in the quality of habitat available on moorland. English Nature has made this the subject of various research projects that will investigate Twite in more detail.

Red-throated Diver, Curlew and Kingfisher are listed as having medium conservation importance because of their European population status. Red-throated Diver requires a Medium BTO Alert because of declining nesting success in recent years. The CBC suggests that a large population decline of Curlew has occurred over the last 25 years, although it must be noted that the CBC plots may not be representative for the species in the UK. However there is considerable concern about the status of breeding waders on lowland wetlands and in more upland areas (Brown & Grice 1993, Robson *et al.* 1995, Shrubb *et al.* 1997). For Kingfisher, the decline in breeding performance measured by the NRS merits further research, but is likely to reflect changes in riverine habitat quality and management.

All the other 8 species were not included on the lists of high or medium conservation importance.

Mistle Thrush now warrants being included on the lists of conservation importance because it has declined in population size by >25%. Mistle Thrush is the third *Turdus* species to show such declines and research on its congeners may throw light on its population decline.

Tawny Owl and Meadow Pipit show severe declines on CBC plots. Although Tawny Owl is probably poorly monitored by the CBC because of its crepuscular and nocturnal habits, and Meadow Pipit has a distribution for which CBC coverage is not representative, the declines are the only long-term information available on changes in their population sizes and warrant being noted by conservationists. Tawny Owl has importance as a species at the top of the woodland food-chain and Meadow Pipit has importance as a key species of upland avifaunas.

Grey, Pied and Yellow Wagtails show important population declines on WBS plots over the past 23 years, which may be linked to detrimental changes to the quality of riverine habitats as suggested for Kingfisher (above). Like the Tree Pipit, the Yellow Wagtail is a long-distance summer migrant and its severe decline may be due to factors operating on the breeding grounds, wintering grounds or on migration.

Willow Warbler has declined by 37% on CES plots over the past 14 years. While the CBC index shows some signs of recovery, the CES trend does not. Detailed analysis of population data, survival rates and breeding performance have shown that the decline is largely explained by a fall in the survival rates of adult Willow Warblers in the southern part of its range in the UK (Peach *et al.* 1995). Whether these declines in survival were due to factors operating within or outwith the UK remains to be determined.

Moorhen, Raven and Greenfinch are all species that show long-term declines in breeding performance with only minor declines in population size (or unknown changes in population size for Raven). These Medium BTO Alerts are therefore pre-emptive alerts of possible future declines in population size: they are for species that need to be monitored with care.

4.1.3 Other species of Conservation Importance

Twelve other species are covered by this report and listed on the *Conservation Importance* lists but are not subject to the BTO Alerts discussed above (4.1.1 or 4.1.2).

Kestrel was listed on the Amber list because of a population decline of >25%. The analysis of the most recent data shows that its decline is currently measured at 24% and so does not justify inclusion, although it cannot be said to have recovered.

There are three species of high conservation importance with steadily increasing populations. Merlin population size has increased (BTO *et al.* 1997), although it is not monitored by the BTO, and Nest Record Scheme data show trends of improving breeding performance. Nightjar populations have increased substantially since 1981 (Morris *et al.* 1994) and slight increases in nest failure rates are likely to be associated with movements into new habitats. Woodlark populations have also increased substantially since 1986 (Sitters *et al.* 1996) but for this species no trend has been evident in breeding performance.

Four species of medium conservation importance are so listed because of their European status. Peregrine populations in the UK have increased steadily since the 1970s to reach high levels in 1991 (Crick & Ratcliffe 1995) and breeding performance appears to have recovered fully from the effects of organochlorine pesticide contaminants. Population size of Green Woodpecker has fluctuated on CBC plots but there has been little overall change. Redstart populations have increased considerably on CBC plots and the Nest Record Scheme has found substantial improvements in breeding performance over the past 25 years, but for unknown reasons. Stonechat population size was not monitored by the BTO prior to the BBS but its breeding performance shows no substantial trends.

Hen Harrier is a species of high conservation concern and was the subject of a High BTO Alert in the previous report (Crick *et al.* 1997b) due to declining clutch size. However, subsequent detailed analysis has shown that the trends were an artefact of increasing numbers of records from Orkney, where clutch sizes tend to be lower than on the British mainland (Summers in press, Crick in press).

Barn Owl population size has declined substantially during the latter half of the century (Shawyer 1987) but it is not monitored annually by the BTO. The Nest Record Scheme shows that the breeding performance of Barn Owls has recovered since the 1960s (Percival 1992) and is now relatively steady, with no long-term trends.

Swallow and Goldfinch populations were both previously included on the Amber List because they had been recorded as having declined by more than 25%. Similarly, Little Owl was the subject of a Medium BTO Alert in the previous report (Crick *et al.* 1997b) because of a population decline of >25%. Reanalysis using the more advanced techniques employed in the current report suggests that these three species no longer fall into this category (c.f. Siriwardena *et al.* 1998). For Swallow, a semi-colonial species, the CBC has to rely on changes in nest counts, which appear to cause the standard CBC chain index to be subject to random drift. A similar problem may have affected the Little Owl index. For Goldfinch, the current CBC index has recovered to 1970s levels, but due to a large population decline in the late 1980s, the statistical technique of quadratic regression employed in the previous report suggested a population decline.

4.2 Interspecific comparisons

Full-scale interspecific comparisons are beyond the scope of this project but have been the subject of detailed analysis in many recent studies (e.g. Fuller *et al.* 1996) and ongoing research projects (e.g. Siriwardena *et al.* 1998). Here, we briefly review the direction of trends shown by species roughly grouped according to ecological types and habitat-use (Appendix 2).

Long-term trends in population size could be estimated by at least one monitoring scheme (see 2.7) for 82 species. For 11 species, the trends increased or decreased by less than 10%. Of the others, there was approximately the same number showing an increase in population size (n=34) as showing a decrease (n=37).

When the species were divided according to ecological types (Table 4.2.1) approximately equal numbers of waterbirds and migrant and resident insectivores showed trends of population increase and decrease. Seed-eaters showed some disparity, with 10 species showing decreases and only four showing increases (three pigeons and Chaffinch). Among raptors and corvids there were more increases than decreases, probably due to the declining effects of organochlorine pesticides and declines in game-keeping interests.

Much the same result occurred when the species were divided according to their characteristic habitat (Table 4.2.2). Such a division has necessarily to be crude, given that most bird species are relatively wide-ranging and occur in a number of different habitats. Similar numbers of woodland species have increased and decreased. There is a preponderance of decreases among grassland and marsh birds and among farmland birds, but birds of coastal areas and inland waterbodies tend to be increasing.

Long-term trends in breeding performance per nesting attempt could be estimated for 83 species from either NRS or CES. For 29 species, there were no significant trends over time. For the others, a substantial majority (n=42) showed an improvement in breeding performance compared with 12 that showed a significant decline.

When the species were divided according to ecological types (Table 4.2.3), raptors and corvids and the resident insectivores had relatively high numbers of species with improving trends in breeding performance per nesting attempt. Among seed-eaters, a relatively high proportion of species have declining trends in breeding performance.

After being divided according to broad habitat categories (Table 4.2.4), species most associated with heathland/bog/upland habitat and those associated with waterbodies or coastal habitats were relatively more likely to have declining breeding performance per nesting attempt than were birds in other habitats. Surprisingly, birds in farmland were more likely to have improving breeding performance than would be expected from the overall proportion of species across all habitats. The general trend of improving nest success, which is particularly evident for farmland species, lends support to the idea that declines in the use of organochlorine pesticides since the 1960s has had an important effect (Crick 1997, Chamberlain & Crick in press).

4.3 Future plans

This report is the second version of a report that we hope will develop over the coming years to be a regular, important and useful document for conservation practitioners in the UK. We will seek feedback from users of this report to show how it can be made more user-friendly and on the sorts of extra information that would be useful and if currently it contains information that could be dispensed with.

The next report will be produced in approximately three years' time as part of BTO/JNCC partnership.

4.3.1 Timing of the report

Data from each scheme contributing to this report become available at different times of the year following the breeding season being recorded. For example, data from the 1996 breeding season became available as follows:

CES February 1997
CBC March 1997
Heronries Census	... May 1997
WBS May 1997
BBS August 1997
NRS August 1997

Thus a report providing the integrated results from these schemes can be produced in the October or November of the year following the season being reported.

4.3.2 Data analysis

In future, various developments in data analysis are envisaged that will be incorporated into these reports as the methodologies become established. There are additional datasets that may become available, there are different ways in which the data could be subdivided, there are better analytical techniques for currently analysed datasets and there are developments that will occur in the BTO Alert system.

The major additional BTO dataset comprises the Age Specific Totals Lists derived from the Ringing Scheme. These were introduced in 1985 to collect cohort sizes (the numbers of adults, juveniles, pulli and unaged) of birds ringed during the summer (April to September) of each year (Baillie & Green 1987). Twenty-two species of passerine are included, covering a range of common migrant and resident birds. This information, when combined with information on the numbers of ringed birds recovered each year, allows the calculation of age-specific survival rates, while accounting for age- and year-specific variation in recovery reporting rates. Without information from the Age Specific Totals Lists, recovery reporting rates must be assumed to be constant, which could lead to biases in estimates of survival (Baillie & McCulloch 1993). In future, subject to the development of relatively automated means of data handling and analysis,

it should be possible to provide trends in annual survival rates for adults and juveniles for these 22 species.

The current report concentrates solely on trends in the UK. The only subdivision in a dataset is within the CBC, which is divided into farmland and woodland plots when data are sufficient for a particular species. There are many different ways in which data in the report could be divided, according to geography or habitat, but this will have to be undertaken carefully because the power of the analyses will be reduced as the data are subdivided.

A possible requirement for the Country Agencies might be to have information provided at the country level (England, Scotland, Wales and Northern Ireland) although this may mean little biologically. A report on wildlife information and indicators for the Department of Environment, Transport & Regions, written by a consortium that included the BTO, recommended the use of "Landscapes" for wildlife reporting (Parr *et al.* 1996). These are defined with the use of the ITE Land Classification (Bunce *et al.* 1996) which classifies each 1-km square in Britain according to its geographical and ecological characteristics. The Landscapes are linked to dominant type of agriculture, and reflects the natural environment, they are: Arable, Pastural, Marginal Upland (e.g. much of Wales) and True Upland (e.g. much of Scotland). Habitat-based divisional splits will need to be relatively broad to ensure that there are sufficient data for each category. The BTO has developed a habitat coding scheme that is used throughout the various monitoring schemes and is compatible with other widely used habitat classifications (Crick 1992b). The top level of this system would provide the most convenient basis for investigating the data (viz: Woodland, Scrubland, Grassland, Heathland, Farmland, Human, Freshwater, Coastal, Rock).

There have been considerable advances recently in the analysis of between-year changes in population size of the sort measured by CBC, WBS, CES and BBS. These are superior to traditional methods that involve simple chain-indexing in that they make more efficient use of available data and are not subject to random drift. The Mountford method, as used in the present report, is one of the newer approaches that makes efficient use of the available data and is able to generate confidence limits on the population indices. It is limited by the fact that it assumes homogeneity of between-year changes across sites and hence the model has to be fitted to relatively short time periods that are then linked together. The Mountford method is related to the more sophisticated Loglinear Poisson regression methods (McCullagh & Nelder 1989, ter Braak *et al.* 1994) that are being used increasingly in this field. The latter approaches are more flexible in that covariates such as observer, habitat and regional effects can be incorporated and a single model fitted to the time series. We plan to use the more advanced regression methods in future reports.

In unmodified series of data points, long-term trends are often obscured by both short-term fluctuations and measurement error. Smoothing algorithms provide a way to reduce the influence of these factors, thereby revealing underlying long-term trends (Buckland *et al.* 1992). Use of these techniques has been found very useful in the analysis of CBC data (Siriwardena *et al.* 1988; Marchant *et al.* 1997; this report) and could also be used in the analysis of breeding performance and survival rates. Another way to tackle this problem would be to analyse the data using Generalized Additive Models (GAMs: Hastie & Tibshirani 1990). GAMs could

incorporate both Loglinear Poisson regression and smoothing into a single flexible framework that, due to its statistical efficiency, would allow the estimation of narrower confidence intervals.

The system of BTO Alerts used in this report is simple and straightforward, which has benefits in terms of understandability. A more sophisticated system of alerts has been developed by Marchant *et al.* (1997) to analyse long-term trends in population size and could be used in future editions of this report. Between-year changes in population size are smoothed and then trends are measured as the differences in population size measured over 5, 10 and 25 year periods. (They also suggest measuring 1-year differences using unsmoothed data). Four levels of alert were suggested:

Alert 1: >50% decline

Alert 2: 25-49% decline

Alert 3: >50% decline predicted to occur over 25 years if current rate continues

Alert 4: 25-49% decline predicted to occur over 25 years if current rate continues.

Over the next year, a series of discussion meetings and workshops will be held, involving statisticians and conservationists, to attempt to reach consensus on the best way forward for the development of alert systems. These will be held under the auspices of the BTO/JNCC and the WeBS partnerships.

Ideally, an alert system should include some aspect of the ability of species to recover from population declines. Greenwood *et al.* (1995) suggested separate measures of “resilience”, “consistency” and “deviance”, but it might be possible to design a system of alerts for population changes that incorporates information on net reproductive rate and density dependence within a single system in the future.

Alert systems, such as the one above, are only appropriate for census data because relatively small declines in breeding performance or survival rates can have significant long-term effects on population size. Changes of >25% are likely to have relatively massive effects on population size. The ideal would be a system that reflected the possible impact of any decline on population size by making reasonable assumptions about a species’ life history, but this is unlikely to be realisable for some time.

4.4 Conclusion

We hope that this report will be both useful as a ready source of information for the day-to-day use of conservation practitioners and as a source of information for those involved in more strategic conservation policy making. The information presented here is very much the tip of the data iceberg held by the BTO, providing a concise overview and pointers about how populations are changing and where further research and conservation action needs to be taken.

The report raises BTO Alerts for 39 species due to declines in population size, breeding performance or survival. This list of species will help inform conservation organisations when

they are drawing up their plans for priority work, especially as the current lists, such as the *Conservation Importance List*, quickly become dated.

The information in this report on demographic factors will also help conservation organisations to target their resources more effectively. For declining species of conservation importance, the lack of a decline in breeding performance suggests that either loss of habitat or changes in the factors affecting survival are more likely to be playing a role rather than factors affecting nesting success.

Finally, we hope that users of this report will provide feedback on how the report can be improved in the future. We will welcome comments on any aspect of this report if they help us to produce a better and more useful product in the next edition.

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Table 2.3.1 Frequency of habitat types recorded by the BBS in 1995

Major Habitat	Percentage of transect sections
Farmland	54.2
Human Sites	15.7
Woodland	12.1
Heathland & Bogs	8.0
Grassland	5.0
Scrubland	2.3
Water Bodies	1.7
Inland Rock	0.6
Coastal	0.4
Miscellaneous	0.1
TOTAL	100.0

Table 4.1.1. List of species assigned High BTO Alert Status

Species	Population Change (Scheme) ¹	Significant Demographic Decline ²	Current Conservation Importance ³
Grey Partridge	-78% (CBC)	-- ⁴	High
Snipe	-90% (CBC) ⁵	No	Medium
Woodcock	-55% (CBC) ⁵	--	Medium
Redshank	-72% (CBC) ⁵	No	Medium
Turtle Dove	-62% (CBC) ⁵	No	High
Lesser Spotted Woodpecker	-76% (CBC) ⁵	--	Unlisted
Skylark	-60% (CBC)	No	High
Tree Pipit	-56% (CBC) ⁵	No	Unlisted
Song Thrush	-52% (CBC)	Yes ²	High
Grasshopper Warbler	-59% (CBC) ⁵	--	Medium
Goldcrest	-60% (CBC)	No	Unlisted
Spotted Flycatcher	-78% (CBC)	No	High
Willow Tit	-50% (CBC) ⁵	--	Medium
House Sparrow	-64% (CBC) ⁵	--	Unlisted
Tree Sparrow	-87% (CBC) ⁵	No	High
Redpoll	-89% (CBC) ⁵	No	Unlisted
Bullfinch	-62% (CBC)	No	High
Yellowhammer	-60%(CBC)	No	Unlisted
Reed Bunting	-64% (CBC)	Yes	High
Corn Bunting	-74% (CBC) ⁵	No	High

¹ CBC population changes are for the All-plots Index.

² In all cases but one, significant demographic decline refers to a decline in breeding performance; for the Song Thrush it refers to a decline in survival rates.

³ Species are ranked as High if on Tables 2 or 3 of the Conservation Importance List or on the Red List of Birds of Conservation Concern; or as Medium if on Table 4, or on the Amber List respectively.

⁴ Insufficient data indicated by --

⁵ A caveat is in place for this population change - see species account.

Table 4.1.2. List of species assigned Medium BTO Alert Status

Species	Population Change (Scheme)	Significant Demographic Decline ²	Current Conservation Importance ³
Red-throated Diver	-- ⁴	Yes	Medium
Moorhen	+27% (WBS)	Yes	Unlisted
Lapwing	-42% (CBC) ⁵	No	Medium
Curlew	-26% (CBC) ⁵	No	Medium
Tawny Owl	-33% (CBC) ⁵	No	Unlisted
Kingfisher	+22% (WBS) ⁵	Yes	Medium
Meadow Pipit	-28% (CBC) ⁵	No	Unlisted
Yellow Wagtail	-39% (WBS) ⁵	No	Unlisted
Grey Wagtail	-34% (WBS) ⁵	No	Unlisted
Pied Wagtail	-39% (WBS) ⁵	No	Unlisted
Dunnock	-31% (CBC)	No	Medium
Blackbird	-33% (CBC)	No	Medium
Mistle Thrush	-34% (CBC)	No	Unlisted
Willow Warbler	-37% (CES)	Yes ²	Unlisted
Marsh Tit	-37% (CBC)	No	Medium
Raven	--	Yes	Unlisted
Starling	-45% (CBC)	No	Medium
Greenfinch	+3% (CBC)	Yes	Unlisted
Linnet	-41% (CBC)	Yes	High
Twite	--	Yes	High

¹ CBC population changes are for the All-plots Index.

² In all cases but one, significant demographic decline refers to a decline in breeding performance; for the Willow Warbler it refers to a decline in survival rates.

³ Species are ranked as High if on Lists 2 or 3 of the Conservation Importance List or on the Red List of Birds of Conservation Concern; or as Medium if on Table 4, or on the Amber List respectively

⁴ Insufficient data indicated by --

⁵ A caveat is in place for this population change - see species account.

Table 4.2.1 Number of species (and proportions in parentheses) showing population increases, decreases or no trend, when divided according to ecological type (see Appendix 2 for details)

	Population Increase (>10%)	Population Decrease (>10%)	No Trend (<10% change)
Waterbirds	8 (57%)	6 (43%)	0
Raptors and Corvids	6 (60%)	2 (20%)	2 (20%)
Resident Insectivores	10 (43%)	12 (52%)	1 (5%)
Migrant Insectivores	6 (33%)	6 (33%)	6 (33%)
Seed-eaters	4 (24%)	11 (65%)	2 (11%)
All Species	34 (41%)	37 (45%)	11 (14%)

Table 4.2.2 Numbers of species (and populations in parentheses) showing population increases, decreases or no trend, when divided according to broad habitat categories (see Appendix 2 for details)

	Population Increase (>10%)	Population Decrease (>10%)	No Trend (<10% change)
Woodland/Scrub	19 (49%)	15 (38%)	5 (13%)
Grassland/Marsh	0 (0%)	6 (60%)	4 (40%)
Heathland/Bogs/Upland	0	3	0
Farmland	6 (35%)	10 (59%)	1 (6%)
Human Sites	1	1	1
Waterbodies/Coastal	8 (80%)	2 (20%)	0
All Species	34 (41%)	37 (45%)	11 (14%)

Table 4.2.3 Number of species (and proportions in parentheses) showing different types of trend in breeding performance per nesting attempt when divided according to ecological type (see Appendix 2 for details)

	Significant Breeding Performance Improvement	Significant Breeding Performance Decline	Non-significant Trend in Breeding Performance
Waterbirds	1 (9%)	4 (33%)	7 (58%)
Raptors and Corvids	12 (75%)	1 (6%)	3 (19%)
Resident Insectivores	13 (62%)	1 (5%)	7 (33%)
Migrant Insectivores	8 (44%)	2 (12%)	8 (44%)
Seed-eaters	8 (50%)	4 (25%)	4 (25%)
All species	42 (51%)	12 (14%)	29 (35%)

Table 4.2.4 Numbers of species (and proportions in parentheses) showing different types of trend in breeding performance per nesting attempt when divided according to broad habitat categories(see Appendix 2 for details)

	Significant Breeding Performance Improvement	Significant Breeding Performance Decline	Non-significant Trend in Breeding Performance
Woodland/Scrub	19 (56%)	3 (9%)	12 (35%)
Grassland/Marsh	5 (56%)	1 (11%)	3 (33%)
Heathland/Bogs/Upland	3 (25%)	3 (25%)	6 (50%)
Farmland	12 (71%)	1 (5%)	4 (24%)
Human Sites	1	0	0
Waterbodies/Coastal	2 (20%)	4 (40%)	4 (40%)
All Species	42 (51%)	12 (14%)	29 (35%)

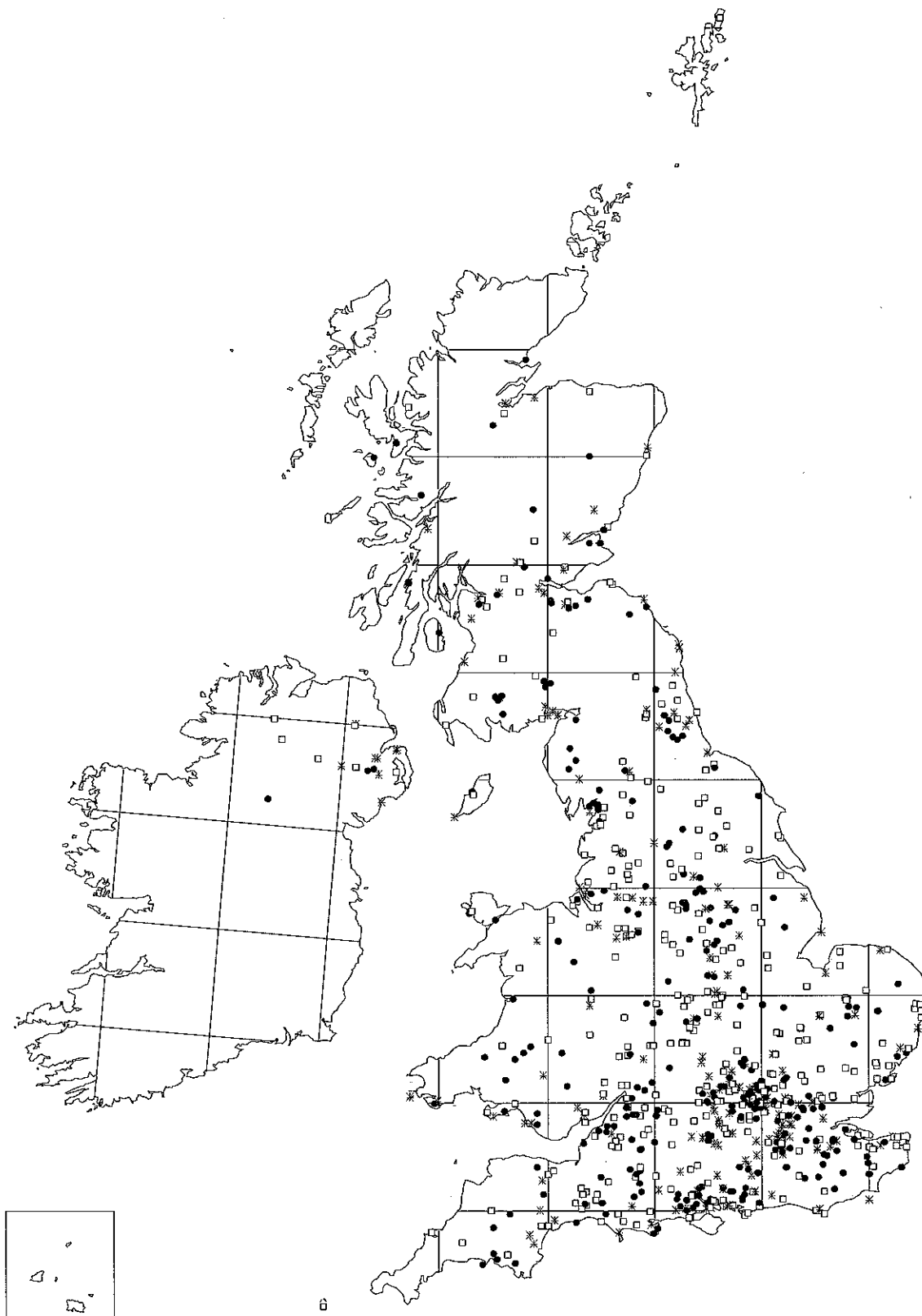


Figure 2.1 The distribution of Common Birds Census plots contributing data to estimates of percentage change between 1972 and 1996. Habitat categories are shown separately: open squares - farmland; filled circles - woodland; asterisks - special habitats.

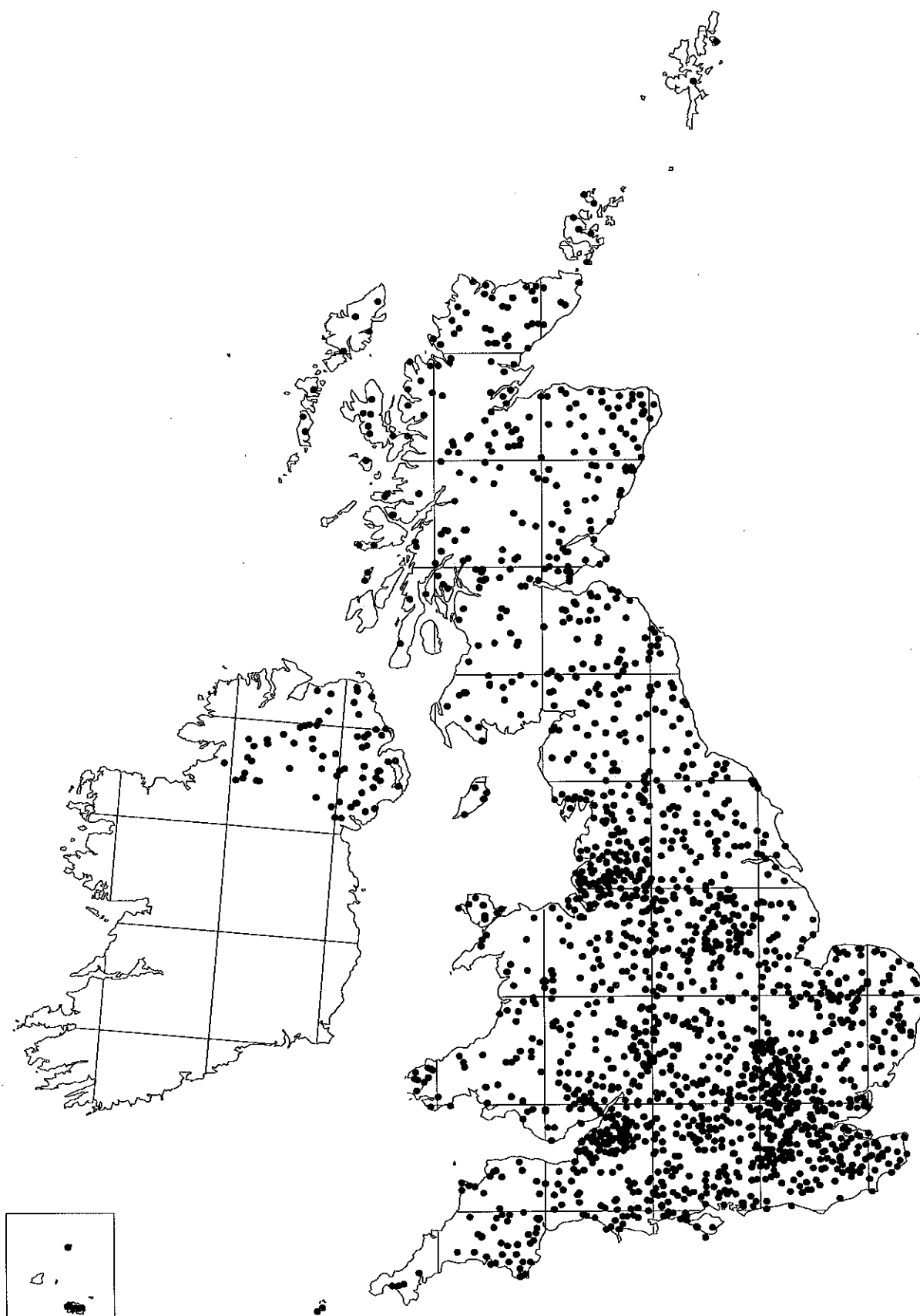


Figure 2.2 The distribution of the Breeding Bird Survey plots contributing to estimates of percentage change between 1995 and 1996.

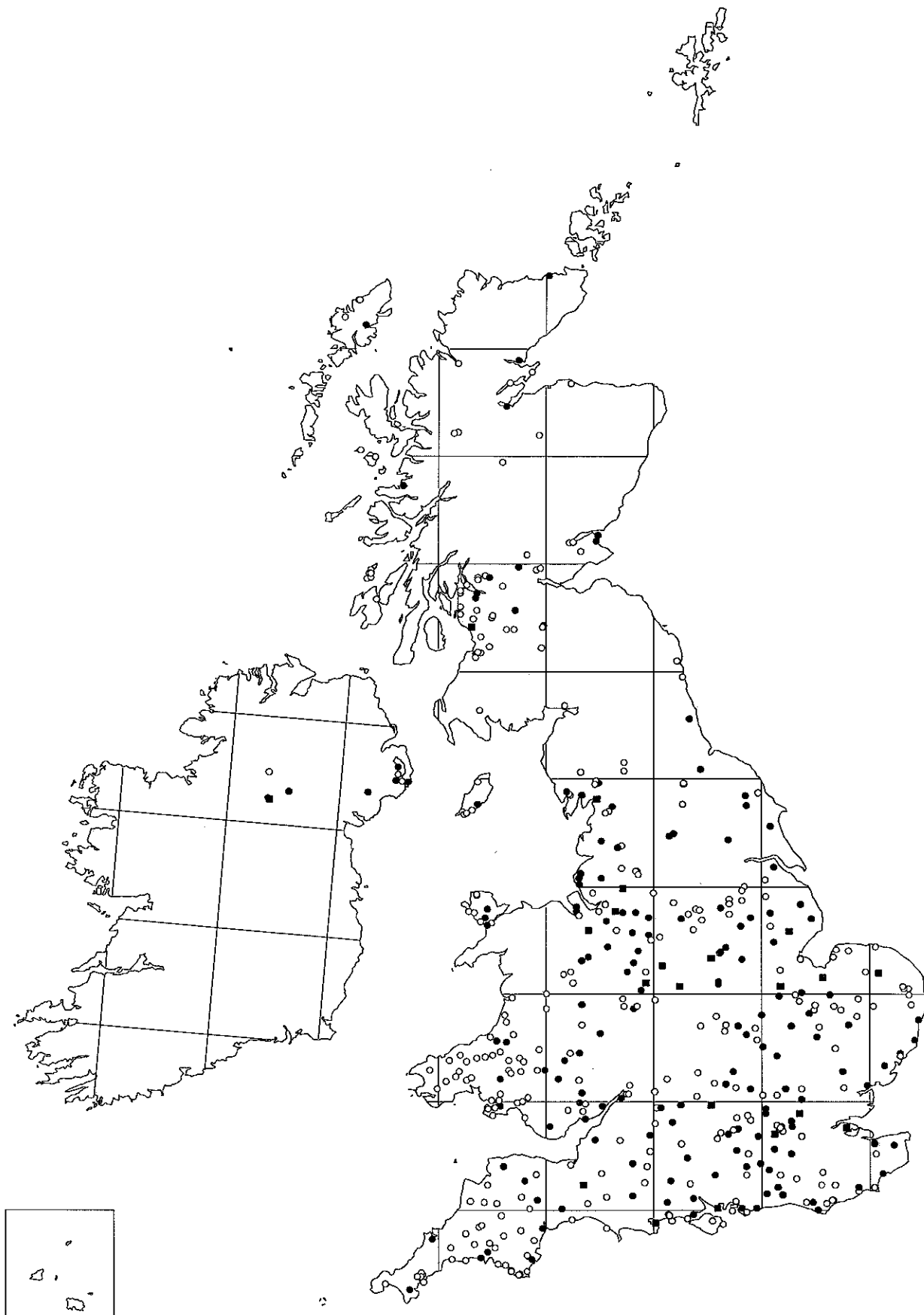


Figure 2.3 Heronries counted for the BTO's Heronries Census in 1996. Heronry size is indicated as follows: open circle, 1-10 nests; filled circle, 11-50 nests; filled square, 51-160 nests.

Appendix 1 Population changes of extra species monitored by Breeding Bird Survey between 1994 and 1996. Sufficient information is currently unavailable for the species from other BTO monitoring schemes

Species	Change %	Caveat
Cormorant <i>Phalacrocorax carbo</i>	-16 n.s.	
Greylag Goose <i>Anser anser</i>	+218 *	
Canada Goose <i>Branta canadensis</i>	+34 *	
Shelduck <i>Tadorna tadorna</i>	+4 n.s.	
Black-headed Gull <i>Larus ridibundus</i>	-15 *	
Common Gull <i>Larus canus</i>	+14 n.s.	
Lesser Black-backed Gull <i>Larus fuscus</i>	+46 *	
Herring Gull <i>Larus argentatus</i>	+58 *	
Great Black-backed Gull <i>Larus marinus</i>	+42 *	
Sand Martin <i>Riparia riparia</i>	+123 *	
Siskin <i>Carduelis spinus</i>	+73 *	

Appendix 2 List of species categorised by broad ecological type and habitat, with a summary of changes in population size and breeding performance (Key is given at end of table)

Species	Ecological Type	Habitat	Population Change	Breeding Performance Change
Red-throated Diver	W	W		-
Little Grebe	W	W	+	
Grey Heron	W	W	+	0
Mute Swan	W	W	+	0
Mallard	W	W	+	
Tufted Duck	W	W	+	
Hen Harrier	R	H/B		0
Sparrowhawk	R	W/S	+	+
Buzzard	R	W/S	+	+
Kestrel	R	F	-	+
Merlin	R	H/B		+
Hobby	R	F		0
Peregrine	R	H/B		0
Grey Partridge	S	F	-	
Moorhen	W	W	+	-
Coot	W	W	+	
Oystercatcher	W	W		0
Ringed Plover	W	W		-
Golden Plover	W	H/B		0
Lapwing	W	F	-	0
Snipe	W	G	-	0
Woodcock	W	W/S	-	
Curlew	W	H/B	-	0
Redshank	W	G	-	+
Common Sandpiper	W	H/B	-	
Stock Dove	S	F	+	+
Woodpigeon	S	F	+	
Collared Dove	S	H	+	+

Species	Ecological Type	Habitat	Population Change	Breeding Performance Change
Turtle Dove	S	F	-	0
Cuckoo	M	G	0	
Barn Owl	R	F		+
Little Owl	R	G	0	+
Tawny Owl	R	W/S	-	+
Long-eared Owl	R	W/S		+
Nightjar	M	H/B		-
Kingfisher	W	W	+	-
Green Woodpecker	I	W/S	+	
Great Spotted Woodpecker	I	W/S	+	+
Lesser Spotted Woodpecker	I	W/S	-	
Woodlark	S	H/B		0
Skylark	S	F	-	+
Swallow	M	F	+	+
House Martin	M	H	0	
Tree Pipit	M	W/S	-	+
Meadow Pipit	I	H/B	-	+
Rock Pipit	I	W		0
Yellow Wagtail	M	G	-	0
Grey Wagtail	I	W	-	+
Pied Wagtail	I	F	0	0
Dipper	I	W	-	+
Wren	I	W/S	0	+
Duncock	I	W/S	-	+
Robin	I	W/S	+	+
Nightingale	M	W/S	-	-
Redstart	M	W/S	+	+
Whinchat	M	H/B		0
Stonechat	I	H/B		+
Wheatear	M	G		+
Blackbird	I	W/S	-	0

Species	Ecological Type	Habitat	Population Change	Breeding Performance Change
Song Thrush	I	W/S	-	+
Mistle Thrush	I	W/S	-	0
Grasshopper Warbler	M	G	-	
Sedge Warbler	M	G	0	0
Reed Warbler	M	G	0	+
Lesser Whitethroat	M	W/S	0	0
Whitethroat	M	W/S	+	0
Garden Warbler	M	W/S	+	0
Blackcap	M	W/S	+	0
Wood Warbler	M	W/S	+	0
Chiffchaff	M	W/S	0	+
Willow Warbler	M	W/S	-	+
Goldcrest	I	W/S	-	0
Spotted Flycatcher	M	F	-	+
Long-tailed Tit	I	W/S	+	+
Marsh Tit	I	W/S	-	+
Willow Tit	I	W/S	-	
Coal Tit	I	W/S	+	
Blue Tit	I	W/S	+	0
Great Tit	I	W/S	+	0
Nuthatch	I	W/S	+	+
Treecreeper	I	W/S	+	-
Jay	R	W/S	0	
Magpie	R	F	+	+
Jackdaw	R	W/S	+	+
Rook	R	F	+	+
Carrion Crow	R	F	+	+
Raven	R	H/B		-
Starling	I	G	-	+
House Sparrow	S	H	-	
Tree Sparrow	S	F	-	+

Species	Ecological Type	Habitat	Population Change	Breeding Performance Change
Chaffinch	S	W/S	+	+
Greenfinch	S	W/S	0	-
Goldfinch	S	W/S	0	0
Linnet	S	F	-	-
Twite	S	H/B		-
Redpoll	S	W/S	-	0
Bullfinch	S	W/S	-	+
Yellowhammer	S	F	-	+
Reed Bunting	S	G	-	-
Corn Bunting	S	F	-	+

KEY:

Ecological Type:	Waterbirds	=	W
	Raptors & Corvids	=	R
	Resident Insectivores	=	I
	Migrant Insectivores	=	M
	Seed-eaters	=	S
Habitat:	Wood/Scrub	=	W/S
	Grass/Marsh	=	G
	Heath/Bog/Upland	=	H/B
	Farmland	=	F
	Human habitats	=	H
	Waterbodies/Coast	=	W
Population Change:	>10% increase	=	+
	>10% decrease	=	-
	<10% change	=	0
Breeding Performance Change:	Significant increase	=	+
	Significant decrease	=	-
	Trend not significant	=	0

