

Population estimates of birds in Great Britain and the United Kingdom

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Abstract Population estimates of birds have a wide range of practical conservation uses, as well as being of enduring interest to many birdwatchers. Following previous reports by the Avian Population Estimates Panel, in 1997 and 2006, we present the third collation of population estimates of birds in Great Britain and the United Kingdom. There are now thought to be about 84 million breeding pairs of birds in the UK. The ten commonest species contribute 57% of this total, with Wren *Troglodytes troglodytes* alone providing one in ten of our breeding birds. In all, 23 species exceed one million breeding pairs. The individual population estimates come from a wide variety of sources, many from extrapolation of previous estimates by recognised trend measures, others from new surveys and novel analytical approaches developed since the last report. Despite the exceptional level of detail available for some species, many gaps in our knowledge remain. Recommendations are made to allow a continuing improvement in our understanding of the numbers of birds in GB and the UK. There are many opportunities for volunteer and amateur birdwatchers to make a significant contribution.

How many birds are there in a population? Sometimes the most straightforward of questions can be the most difficult to answer. For most species, it is impossible to count every individual and so bird numbers are *estimated* from sample counts, using a variety of statistical techniques and assumptions about behaviour and detectability. Yet bird numbers are inherently dynamic, fluctuating within and between years as a result of reproduction, mortality, immigration and emigration (Newton 1998). Consequently, the emphasis of much population-based research involves generating and understanding population *trends*, rather than total numbers. Nonetheless, the absolute size of an animal population is still important in conservation terms, in particular for the rarest species, which may be under threat of extinction (Mace 1994).

The UK statutory conservation agencies and relevant non-governmental organisations have previously collaborated through the Avian Population Estimates Panel (APEP) to collate the best estimates of the size of breeding and non-breeding bird populations. Both previous reports were published in *BB*, in 1997 (Stone *et al.* 1997, *APEP 1*) and 2006

(Baker *et al.* 2006, *APEP 2*). Their purpose was to present a consensus view on the most appropriate estimates for a range of conservation applications. In 2002, the Joint Nature Conservation Committee (JNCC) acknowledged the value to conservation agencies of a single, quality-assured source of population estimates for statutory conservation purposes and endorsed the APEP process (Stroud *et al.* 2002).

The significance of the APEP's work has increased with recent developments in European bird conservation policy. Article 12 of the European Union's (EU) Directive on the conservation of wild birds (2009/147/EC) requires Member States to submit a triennial report on the implementation of the Directive. Previous such reports (e.g. Defra 2007) focused on processes, with little or no assessment of the efficacy of Directive implementation. However, a new reporting format has now been agreed, which moves Article 12 reporting to a six-year cycle and focuses on assessment of species status (population sizes, trends and distributions, and changes in these parameters over time). The first such reporting cycle is being undertaken jointly with BirdLife International, and thus will



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56. White-tailed Eagle *Haliaeetus albicilla*, Mull, Argyll, September 2012. This spectacular raptor, successfully reintroduced to Scotland in the late twentieth century, is well monitored by the RBBP and we have a very good estimate of its current population.

contribute to a wider assessment of the status of birds in Europe (and the third edition of *Birds in Europe*; see BirdLife International 2004). To encourage national joint assessments between Member State authorities and the respective BirdLife partners, the European Commission has promoted the APEP as a model of good working.

This, the third APEP report, presents the most recent population estimates for both Great Britain and the United Kingdom. These, together with other data and information, will support the UK's Article 12 report to the EU due for submission in December 2013. However, we hope that the estimates are also interesting and informative for a much wider range of users.

Scope

Species, subspecies and biogeographic populations

All species in Categories A and C of the British List were considered but other non-native species were excluded. Population estimates were principally sought at species level but for some species it was possible to give separate estimates of different subspecies. This was of particular interest for subspecies with a distinct legal status and/or those con-

sidered endemic to parts of the UK. However, because of a lack of knowledge of distribution, it was not possible to give estimates for three currently recognised endemic subspecies: Meadow Pipit *Anthus pratensis whistleri*, Linnet *Carduelis cannabina autochthona* and Yellowhammer *Emberiza citrinella caliginosa* (and estimates for some other subspecies are similarly problematic). For some waterbirds, it is common practice to treat clearly delineated biogeographic populations separately, and we follow Musgrove *et al.* (2011) in this regard.

Geographic area

As far as possible, separate estimates have been produced for Great Britain (GB) and the United Kingdom (UK). All estimates exclude the Channel Islands. The Isle of Man (IoM) is not part of GB or the UK, but its exclusion from most population estimates is generally not straightforward and most estimates are actually for GB+IoM and UK+IoM. For most species, this makes very little difference to the estimates, especially following rounding. However, for five species (Hen Harrier *Circus cyaneus*, Peregrine Falcon *Falco peregrinus*, Ringed Plover *Charadrius hiaticula*, Herring Gull *Larus argentatus* and Red-billed Chough



Steve Young/Birdwatch

57. Little Gull *Hydrocoloeus minutus*, Lancashire & N Merseyside, April 2012. One of the most difficult groups, in terms of estimating national population size, is that of non-breeding seabirds.



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58. Barn Owl *Tyto alba*, Northumberland, February 2010. In many parts of the UK, this is the most frequently encountered owl, hunting in daylight in a variety of open habitats; and yet, in terms of estimating population size, it is surprisingly poorly known.

Pyrhacorax pyrrhacorax) the Isle of Man contributes a significant and calculable proportion of the GB/UK total; for these, separate IoM estimates are presented (together with strict GB and UK estimates). Estimates mostly exclude offshore areas out of sight of land, although this definition may be stretched by aerial survey data incorporated into Common Scoter *Melanitta nigra* and Red-throated Diver *Gavia stellata* estimates.

Seasons

Breeding-season estimates are presented for all species with at least one case of proven breeding from 2006 onwards. Appendix 3 covers those other species where there was a lower level of breeding evidence, plus a number of historical breeding species that exhibited no breeding evidence, over the same period.

It was harder to define those species for which non-breeding estimates should be presented. The precise definition of the non-breeding season varies according to species and estimation technique (as set out in this paper and in those referenced) and this should be taken into account. In general, non-breeding estimates were omitted for largely resident species, except for waterbirds

where statutory site protection and reporting is based around non-breeding estimates. In some cases (such as Blackbird *Turdus merula* and Common Chaffinch *Fringilla coelebs*), common residents are supplemented by large-scale autumn arrivals, but estimates of non-breeding numbers have not been attempted for these species owing to a lack of suitable data sources. However, estimates have been produced for species that are substantially more numerous outside the breeding season. These include scarce wintering species (such as Great Grey Shrike *Lanius excubitor*) but not scarce passage migrants (such as Barred Warbler *Sylvia nisoria*). Rare migrants and vagrants (species covered by BBRC) were excluded unless there were recent breeding records.

Estimating non-breeding numbers of seabirds is particularly difficult, both in terms of monitoring species away from breeding colonies and in terms of the passage of many species through UK waters. In most cases, such estimates have been omitted. Estimates of passage numbers of other species are also excluded, with the exception of the globally threatened Aquatic Warbler *Acrocephalus paludicola*, which occurs here only at this point in its life-cycle.

Timescale

The aim has been to collate the most recently published estimates. However, many of the estimates presented here are based on novel analyses that extrapolate from previously published estimates. In these cases, breeding-season estimates have been extrapolated mostly to 2009 (as described below).

Methods

For every combination of species, geographical area and season, details of the most recent published estimate were identified. In addition, for older estimates (2004 or earlier) the possibility of extrapolating those estimates forward in time was investigated, as described below. In some cases, more than one estimate was available for a given species/region/season combination, when a collective decision was made on the most appropriate one to use.

Many of the estimates in *APEP 1* and *APEP 2* were derived from three national bird atlases – the 1968–72 *Breeding Atlas* (Sharrock 1976), 1981–84 *Winter Atlas* (Lack 1986) and 1988–91 *Breeding Atlas* (Gibbons et al. 1993). Data from *Bird Atlas 2007–11* (Balmer et al. in prep.) were mostly not available for

APEP 3, although this will be a key source of information for *APEP 4*. However, preliminary data from the new atlas was helpful in some instances, particularly where discrepancies arose between multiple estimates derived by different methods.

1. Common breeding species: extrapolation from the 1988–91 *Breeding Atlas*

For many common species, *APEP 1* simply presented estimates published in the 1988–91 *Breeding Atlas*. In *APEP 2*, these estimates were extrapolated forwards according to the most appropriate trend information available, generally the Common Birds Census (CBC) or Breeding Bird Survey (BBS) trends from the time. For *APEP 3*, estimates for many common species were generated by an equivalent procedure, but close attention was paid to both the means of derivation of the original estimate and which trend measure to use for extrapolation.

Original estimates

Breeding population estimates were presented for all species in the 1988–91 *Breeding Atlas* but a variety of methods were used. For



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59. Eurasian Curlew *Numenius arquata*, Norfolk, February 2010. The populations of several waders, in particular the Curlew, are a cause for concern in their upland breeding habitats. They are better known, and monitored, on the wintering grounds.

many of the most numerous species, estimates were based on density measures from 1982 CBC data, with an adjustment to allow for the non-random distribution of CBC plots with respect to habitat and geography. Other estimates made more direct use of counts undertaken during timed tetrad visits during fieldwork for the 1988–91 *Breeding Atlas*. In some cases, an estimate was derived by multiplying the number of occupied 10-km squares by an informed guess of the species' density in an 'average' square. Finally, for Tufted Duck *Aythya fuligula*, Eurasian Sparrowhawk *Accipiter nisus* and Wood Warbler *Phylloscopus sibilatrix*, previously published estimates were considered the best estimates and were simply repeated.

For *APEP* 3, we considered the reliability of these different methods carefully, particularly if they were to be considered alongside alternative methods. For example, estimates of common species based on CBC densities were generally judged to be more reliable than those based on an informed guess of average numbers of pairs per square. Wherever possible, the original (unrounded) estimates underlying the figures given in the 1988–91 *Breeding Atlas* were used.

Trend measures for extrapolating through time

Ideally, the 1988–91 *Breeding Atlas* estimates would be extrapolated forward to the present day using trends produced by BBS (Risely *et al.* 2012), but unfortunately the BBS did not start until 1994. For many species, the resultant gap could be bridged by using joint trends based on a combination of BBS and CBC, which ran from 1962 to 2000. (The two schemes were operated in parallel from 1994 to 2000; see Freeman *et al.* 2007b.) For most species there was a good level of agreement between the two surveys for areas well covered by the CBC (broadly, England) and thus a 'CBC/BBS England joint trend' can be generated from 1962 to the present. For about half the species covered by both surveys, it was judged that CBC trends were a sufficient measure of the UK as a whole that a long-term 'CBC/BBS UK joint trend' could also be constructed.

Where a robust CBC/BBS UK joint trend exists, this (or rather, a smoothed line fitted

through it) was used to extrapolate to the year 2009, typically starting from the 1988–91 *Breeding Atlas* estimates. Where that UK joint trend is not robust, the options were to use a smoothed CBC/BBS England joint trend (in a similar manner) or the smoothed BBS-only trend (which is available only from 1995). In general, the smoothed CBC/BBS England joint trend was used unless the majority of the population was not in England or there were known to be highly divergent trends between England and the rest of the UK.

For a small number of species favouring linear waterways, such as the Common Kingfisher *Alcedo atthis*, prior estimates were extrapolated using the smoothed UK joint trend calculated from the Waterways Bird Survey (WBS, running from 1974 to 2007) combined with the Waterways Breeding Bird Survey (WBBS, running from 1998 onwards). For Red Grouse, the estimate from the 1988–91 *Breeding Atlas* was extrapolated to 1995 by means of the National Gamebag Census trend (provided by the Game and Wildlife Conservation Trust and recalibrated to density as per *APEP* 2), and then from 1995 to 2009 by the BBS trend. For three species – Eurasian Teal *Anas crecca*, Red-breasted Merganser *Mergus serrator* and Rock Pipit *Anthus petrosus* – no suitable trend was identified to extrapolate the estimate given in the 1988–91 *Breeding Atlas*.

Extrapolation of estimates from GB to UK

For most species in the 1988–91 *Breeding Atlas*, separate estimates were given for GB and Ireland. For many conservation and other purposes, however, an estimate for the UK (i.e. GB plus Northern Ireland) is required. *APEP* 1 presented UK estimates derived from the original 1988–91 *Breeding Atlas* dataset; population estimates for Northern Ireland were calculated by multiplying the estimates for Ireland by the proportion of a species' population (calculated from the abundance measures, relative or absolute, from each 10-km square) that occurred in Northern Ireland. *APEP* 2 used the ratio of GB:UK estimates in *APEP* 1 to extrapolate newly generated GB estimates to UK totals.

For various reasons (including some major population changes in Ireland in the

intervening years), it was felt that extrapolation of estimates from GB to UK was an area where it was reasonable to use raw data from *Bird Atlas 2007–11*. The extrapolation used was a combination of two factors. First, the ratio of the numbers of 10-km squares with possible, probable or confirmed breeding evidence in GB and UK was calculated. Second, a measure of average density in both GB and Ireland was derived by comparing the results of *Bird Atlas 2007–11* timed tetrad visits (first hour only, and adjusted to account for differing levels of coverage in different areas).

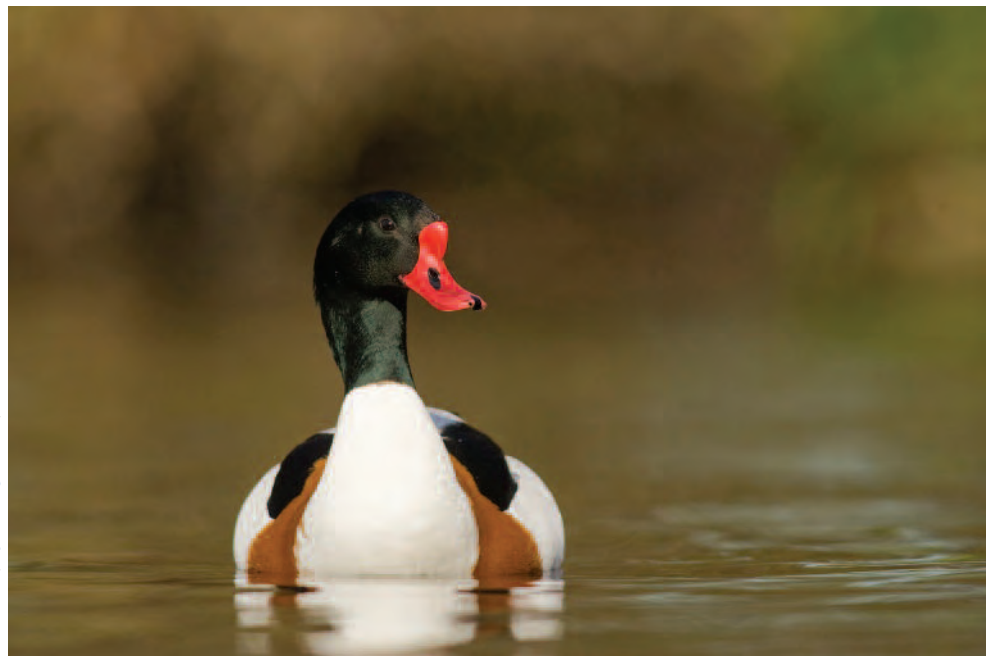
2. Distance sampling

For many common species, in addition to the trend-based extrapolations described above, an alternative set of population estimates was available following the method described in Newson *et al.* (2008). (The estimates for 2006 published by Newson *et al.* were extrapolated forwards to 2009 using the BBS smoothed trend.) This method is based entirely on BBS data and the fact that observations are assigned to multiple distance bands from the survey transect. Statistical analyses can infer the proportion of birds missed by observers, and thus how many birds in total were present in the area surveyed. From this, an

estimate of the total number of birds in GB/UK can be generated and (as a first approximation) this can be halved to give the number of breeding pairs. This method also allows 95% confidence limits to be presented.

This approach is statistically sound but is likely to work better for some species than for others, depending on the nature of the species. For example, for many species the detection of males (by song) is much more likely than detection of females, and thus the method underestimates the true number of pairs present. Ideally, the estimated number of birds would be divided by a factor that better represented the relative detectability of each sex (rather than simply dividing by two). In some cases, for example Grasshopper Warbler *Locustella naevia*, almost all the birds detected during BBS visits are singing males, and thus the estimated number of birds would be approximately equal to the estimated number of pairs. For most other species, the division factor will lie somewhere between one and two.

Distance sampling also makes the assumption that all birds on the transect line would be detected, and that only distance affects the chance of detection. In reality,



Ben Hall (rsbb-images.com)

60. Common Shelduck *Tadorna tadorna*, Martin Mere, Lancashire, March 2008. Numbers of breeding ducks are often poorly known, and this is a priority area for future surveys, both local and national.

detection is affected by other factors, particularly habitat. Furthermore, since this method estimates numbers of birds, not breeding pairs, it will overestimate the number of pairs for species where there is a substantial non-breeding component to the population. For example, most Common Buzzards *Buteo buteo* do not breed until their third year, and so the number of breeding pairs would be lower than suggested by this method. Finally, although BBS squares are a stratified random sample, and so produce a robust measure of change, the transects are by default likely to follow linear features such as roads, paths, hedges and waterways. Thus, for example, an observer is more likely to detect a Moorhen *Gallinula chloropus* than a Red-legged Partridge *Alectoris rufa*.

The panel considered the estimates produced by distance sampling alongside those produced by other methods on a case-by-case basis. It was felt that the approach was likely to produce more accurate estimates for some species, but was less good for others. In particular, distance sampling was felt useful for upland and urban birds, but less useful in cases where there was a large and uncertain difference in detectability between the sexes, or where there was a substantial non-breeding component. If there was no clear evidence as to which of two estimates was likely to be more accurate, the earlier approach (i.e. extrapolating prior estimates by CBC/BBS trends) was retained.

3. Rare breeding birds

For the rarest breeding birds, including non-native species, data from the Rare Breeding Birds Panel (RBBP) were used (e.g. Holling *et al.* 2012). In most cases, to account for population changes and variation in reporting and detection of these species, means were calculated over the five-year period 2006–10. For Lady Amherst's *Chrysolophus amherstiae* and Golden Pheasants *C. pictus*, RBBP data were supplemented by information from relevant county bird reports. More recent data were available for some species but these were generally incomplete, so are not included here. Two exceptions to that involve Eurasian Bittern *Botaurus stellaris* (for which the data were sufficiently complete that mean values based on 2007–11 are given) and Great White

Egret *Ardea alba* (confirmed nesting for the first time in 2012).

For most species, a range is presented, where the minimum is the mean number of confirmed pairs and the maximum is the mean number of possible, probable and confirmed pairs. If these two figures are the same, a single figure is given. Hybrid pairs are not included. Where the mean maximum would round down to zero, a range of 0–1 pairs is shown. For seven species – Common Quail *Coturnix coturnix*, Eurasian Bittern, Water Rail *Rallus aquaticus*, Corn Crake *Crex crex*, Firecrest *Regulus ignicapilla*, Bearded Tit *Panurus biarmicus* and Cetti's Warbler *Cettia cetti* – where breeding is relatively difficult to prove, just the mean number of reported territories is given. A single figure of mean confirmed pairs is also given for three well-monitored species: Stone-curlew *Burhinus oedipnemus*, Avocet *Recurvirostra avosetta* and Roseate Tern *Sterna dougallii*. For Common Goldeneye *Bucephala clangula*, a mean of estimated egg-laying females is presented. For Red Kite *Milvus milvus* there is known to be significant under-reporting to the RBBP as the species becomes more widespread and abundant, so the RBBP's estimates (rather than the reported figures) are used here. Data for the Osprey *Pandion haliaetus* are similarly incomplete, and the RBBP estimate of 200–250 pairs in 2010 is used here.

4. Breeding seabirds

In APEP 2, estimates of breeding seabirds were based on *Seabird 2000*, a national census carried out between 1998 and 2002 (Mitchell *et al.* 2004), except for Northern Gannet *Morus bassanus* (all colonies were surveyed in 2003–04; Wanless *et al.* 2005). Extrapolating *Seabird 2000* estimates forward to the present was considered, but it was felt that there was insufficient knowledge of how representative the trends generated by the Seabird Monitoring Programme are (<http://jncc.defra.gov.uk/page-1550>). For most seabirds, the APEP 2 figures are thus repeated here, although with an assessment of whether these should now be considered too high or too low. The exceptions are Roseate Tern and Mediterranean Gull *Larus melanocephalus*, for which RBBP data are used.

5. Miscellaneous breeding estimates

For a wide range of species, breeding estimates have been sourced from the literature, including novel surveys or analyses of existing data. In some cases, older published estimates have been extrapolated forward to 2009 as described above for estimates from the 1988–91 *Breeding Atlas*. For other species, however, no suitable trend could be found for the purposes of extrapolation. For the Grey Heron *Ardea cinerea*, estimates of the breeding population are derived annually from the Heronries Census and were provided by the BTO. For five species of wildfowl – Greylag Goose *Anser anser*, Canada Goose *Branta canadensis*, Barnacle Goose *B. leucopsis*, Egyptian Goose *Alopochen aegyptiaca* and Mandarin Duck *Aix galericulata* – breeding population estimates were simply derived by dividing the winter estimate by a standard value of three (Meininger *et al.* 1995). For some other species, novel analyses or compilations were undertaken for APEP 3; these are detailed in footnotes to Appendix 1 and involve breeding estimates for Common Eider *Somateria mollissima* and Tawny Strix *Strix aluco*, Long-eared *Asio otus* and Short-eared Owls *A. flammeus*.

6. Wintering waterbirds

Estimates of wintering waterbirds were taken from Musgrove *et al.* (2011). These estimates were based on a variety of data sources, mainly the Wetland Bird Survey (WeBS), Goose & Swan Monitoring Programme (GSMP), Non-estuarine Coastal Waterbird Survey (NEWS), Winter Gull Roost Survey (WinGS) and a variety of other sources, including compilations of county bird reports. The majority of these estimates relate to the period 2004/05–2008/09. The estimates published in Musgrove *et al.* (2011) were for GB only; the UK estimates presented here were produced by entirely equivalent means.

7. Estimates of scarce winter visitors based on BirdTrack/BirdGuides data

APEP 1 presented winter estimates for Rough-legged Buzzard *Buteo lagopus*, Great Grey Shrike, Shore Lark *Eremophila alpestris*, Waxwing *Bombycilla garrulus*, Water Pipit *Anthus spinoletta* and Lapland Bunting *Calcarius lapponicus*. The first two were omitted in APEP 2, but the remainder were included, using estimates dating back to the 1981–84 *Winter Atlas*. A number of other scarce, non-



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61. Rock Pipit *Anthus petrosus*, Cornwall, September 2011. In population terms this is an especially poorly known species, and one for which local, amateur studies could potentially provide significant new information.

breeding species, for which no previous estimates have ever been published, also winter annually in small numbers. For APEP 3, a new approach for scarce wintering species was developed. All records were extracted from the BTO/RSPB/BWI/SOC/WOS BirdTrack database, which for species in question also included all records from the BirdGuides database. Since not all these records are validated, an initial sense check was undertaken, particularly on higher counts, and a few clearly erroneous records were removed.

These records were then summarised by establishing the peak count per 10-km square per month/year; these counts were then summed to give GB/UK totals per month/year. Peak monthly totals per winter were derived, and the mean of these peaks calculated over the five winters 2006/07 to 2010/11. Records were restricted to the mid-winter period of December to March for Yellow-browed Warbler *Phylloscopus inornatus* since the autumn-passage figures are much higher; a similar approach was considered for both Great Grey Shrike and Lapland Bunting, but not implemented because the discrepancy between autumn and winter was less (although still marked). Note that the 'winter' estimate for White-billed Diver *Gavia adamsii* is perhaps better considered a minimum measure of spring passage.

This approach makes a number of broad assumptions, chiefly that in any given month birds observed within a 10-km square relate to the same mobile individuals, whereas those in adjacent squares are considered different individuals. This is a necessary compromise between avoiding double-counting of noteworthy species as they move locally, while wanting to maximise the ability to account for birds found in less regularly visited areas. The assumptions will be variably successful for different species and further refinements are doubtless possible.

8. Estimates from the 1981–84 Winter Atlas

As mentioned above, winter estimates were not generated for most landbirds, particularly residents. However, estimates of winter numbers of Fieldfare *Turdus pilaris*, Redwing *T. iliacus*, Brambling *Fringilla montifringilla* and Snow Bunting *Plectrophenax nivalis* were

retained from APEP 2. These were derived from the 1981–84 Winter Atlas; the data are old and considered to be of low reliability but there is nothing else available to describe these more numerous winter migrants. An estimate of winter numbers of Black Redstarts *Phoenicurus ochruros* is also incorporated from the 1981–84 Winter Atlas; this is thought to be an underestimate but the approach based on BirdTrack data also produced numbers that were clearly too low (based on draft results for Bird Atlas 2007–11).

9. Aquatic Warbler

This is the only species for which an estimate of passage numbers was generated, by collating records of all ringed birds and all published records from county bird reports during 2006–10. A small number of records from BirdTrack and BirdGuides were used to fill the gaps from any unpublished county reports. This estimate is clearly just a bare minimum but it is of significance not only in relation to the species' globally threatened status but also in relation to its Birds Directive Annex 1 status requiring the classification of Special Protection Areas. The estimate here should be considered alongside those of 40 individuals in APEP 1 (1987–92) and 33 in APEP 2 (1996–2000), derived from a similar methodology.

Results

Appendix 1 gives population estimates for GB/UK bird species, while those for selected subspecies or biogeographical populations are shown in Appendix 2 (the species involved are denoted with an asterisk in Appendix 1). For consistency, estimates are rounded to two significant figures (to reiterate: wherever possible, newly generated estimates have been based on original unrounded figures but in some cases the original published sources do not give unrounded figures). Note that for species which are relatively scarce in Northern Ireland, the estimates for GB and UK may appear identical simply as a result of rounding.

All the non-breeding estimates relate to individuals. Breeding-season estimates are mostly given as 'pairs' or 'territories',

depending on survey methodology, and for most purposes the two terms can be used interchangeably. A number of species (including those with a more complex breeding biology) are more sensibly estimated in other units, as shown in Appendix 1. There are statutory requirements for Red-billed Chough population estimates to be presented both as breeding pairs and as numbers of individuals.

So that readers can trace the derivation of each estimate, the section number of the Methods section (1, 2, etc.) is stated with each estimate; for those estimates that involved forwards extrapolation, the trend measure used is also given (e.g. '1-BBS' means extrapolation from a 1988–91 *Breeding Atlas* estimate via the BBS trend).

As with previous APEP reports, there is a broad reliability scoring attached to each estimate, ranging from 1 (good) to 3 (poor). These reliability scores take into account the derivation of original estimates and any methods used for extrapolation. As a general rule, estimates with reliability score 1 are based on direct counts with a minimum of extrapolation, those with reliability score 2 have been arrived at through extrapolation from reliable figures (or with a small amount of uncertainty around the estimate), while those with reliability score 3 were based on assumptions and opinion in place of actual fieldwork. Those estimates in the last category are still considered the best estimates currently available, although in most cases they highlight priorities for future work.

The reliability scores clearly rely heavily on the means of derivation. For example, estimates of many common breeding passerines are based on extrapolation (using a CBC/BBS UK joint trend) of estimates presented in the 1988–91 *Breeding Atlas*, which themselves were largely based on density measures derived from 1982 CBC data. Such estimates (indicated as '1-UK' in the appendices) are based on a foundation of sound data, but have involved a large degree of extrapolation – and thus the majority of estimates for this method are given a reliability score of 2.

In a number of cases, the estimates presented are known to be either too high or too low, but suitable data sources were not avail-

able to update them satisfactorily. In cases where an estimate is known to be too low it is marked with a '+', and where an estimate is too high it is marked with a '-'. It is important to separate this measure of over- or under-estimation from reliability. For example, the breeding estimate for Arctic Skua *Stercorarius parasiticus* is felt to be a good estimate of the population size for the period 1998–2002, when it was produced, but it is also felt to over-represent the size of the current population.

Footnotes are provided for a number of the estimates that require further explanation, in particular where estimates were judged to be less reliable. Finally, references show the original source of an estimate, which should always be acknowledged by users of population estimates.

Discussion and recommendations

APEP findings

Covering just a few pages, Appendices 1 and 2 represent millions of hours of effort from the UK's ornithological community. The bird populations of the UK are often referred to as the best-studied of this taxonomic group anywhere in the world. The foundations for that situation can be traced back to monitoring schemes such as the Wetland Bird Survey and the CBC in the 1960s, fieldwork for the first national atlas, between 1968 and 1972, and the creation of the RBBP in 1973. Developments since, such as rolling programmes of single-species surveys, the launch of the BBS in 1994, further national atlases, and other initiatives such as Bird-Track, have served to improve our knowledge. Although led by professionals, each of these schemes depends on a massive contribution of time, effort and expertise from volunteer observers across the UK, which we wish to recognise here. The efforts of volunteers underpin this report, and the applied conservation uses for which these estimates are fundamental.

The figures here suggest that the UK has a breeding bird population of over 84 million pairs (with 79 million in GB). The ten commonest species contribute 57% of that total, with Wren *Troglodytes troglodytes* alone providing one in ten of our breeding birds and 23 species surpassing the one-million-pairs mark. In contrast, the breeding populations

of the 100 rarest species provide about 0.1% of the total; many of the species that interest birdwatchers greatly actually contribute a tiny proportion of our avifauna.

There are an estimated 168 million breeding birds in the UK but, given lingering winter visitors, passing migrants and non-breeders, the number of birds in the UK each spring must be considerably higher. Those numbers rise rapidly with the production of new offspring, then fall steeply as a result of the higher mortality of young birds. In autumn, surviving offspring are bolstered by passage migrants and winter visitors, not to mention the release of non-native gamebirds. If we estimate, conservatively, that breeding populations have doubled by early autumn, allow for wintering waterbirds (12.5 million), thrushes and landbirds, plus up to 35 million gamebirds (mainly Common Pheasants *Phasianus colchicus*) released for shooting every autumn, it is reasonable to think there may be over 400 million individual birds at large in the UK countryside in autumn.

The data in Appendices 1 and 2 can be broken down in so many insightful ways. More than 8% of our breeding birds are pigeons and doves, more than double the number of all seabirds combined, whereas

less than 0.3% are raptors or owls. About 3% of our breeding birds are non-native species, mostly Pheasants, Red-legged Partridges and Canada Geese. Comparing individual species estimates is often surprising. How many birdwatchers, for example, would guess that we have similarly sized breeding populations of Common Kestrel *Falco tinnunculus* and Leach's Storm-petrel *Oceanodroma leucorhoa*, or of Scottish Crossbill *Loxia scotica* and Little Grebe *Tachybaptus ruficollis*? We invite readers to use the fascinating estimates presented here to make their own investigations.

Estimate reliability

Of course, the statements and comparisons in the previous paragraph are only as robust as the estimates on which they are based; and here we must face the fact that, despite the UK's wealth of monitoring effort, for most species we still feel that the estimates could be improved. Of 492 estimates in Appendix 1, only 31% are classified as 'good' (reliability score 1), and 18% as 'poor' (score 3.) There are some clear patterns in what determines how robust our population estimates are. As fig. 1 illustrates, we have greater confidence in the reliability of estimates for rarer species, whereas there are no 'good' estimates of



Richard Chandler

62. Grey Plover *Pluvialis squatarola*, Norfolk, February 2007. This is one of a number of wintering shorebirds for which current monitoring programmes (i.e. WeBS) provide accurate national estimates.

abundant species; note, however, that the greatest proportion of ‘poor’ assessments apply to populations in intermediate size classes. It is not clear whether this pattern is due to the population sizes themselves, or driven by the variation in the surveys and other estimation methods used for different sizes of population. There are also clear biases in the reliability of estimates according to their derivation (fig. 2). Unsurprisingly, those derived from complete censuses are considered the most robust, and so estimates for breeding seabirds from *Seabird 2000* are well regarded. Of course, while these are high-quality estimates, they are now also rather dated, and a new census, planned for the years around 2015, is extremely important to ensure that this good state of knowledge is maintained. The two next ‘best

performing’ methods of derivation also rely, in many cases, on efforts to count entire populations: for rare breeding birds by the collation of all records by the RBBP (although for many species RBBP coverage is incomplete – see Holling *et al.* 2012), and for wintering waterbirds through WeBS and GSMP.

It is notable that none of the 147 estimates for widespread breeding species, calculated either by extrapolating forward estimates in the 1988–91 *Breeding Atlas* or by distance sampling using BBS data, were considered to be of ‘good’ quality. For the former, there were often doubts about how robust the initial atlas estimates were, some of them based on extrapolation from local density estimates which may not have been representative of the national picture. In many cases

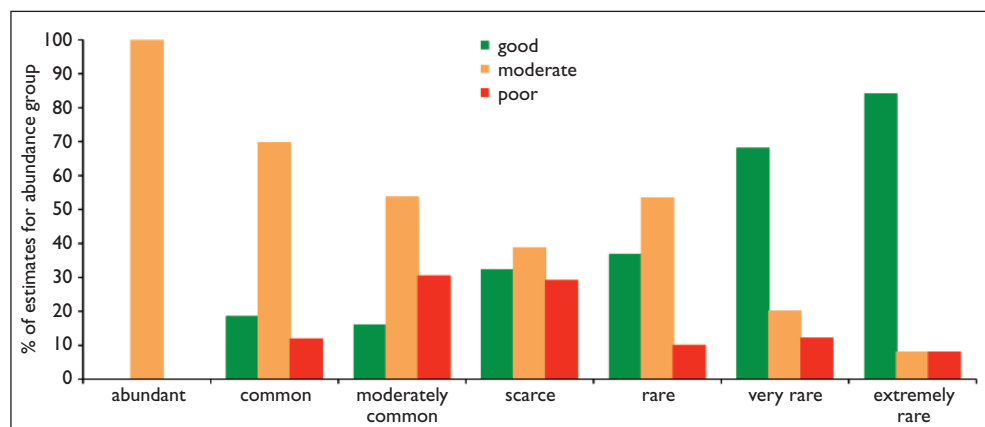


Fig. 1. The variation of confidence in estimate reliability across bird abundance groups; breeding population estimates only.

Key: extremely rare = 0–10 breeding pairs, very rare = 11–100, rare = 101–1,000, scarce = 1,001–10,000, moderately common 10,001–100,000, common 100,001–1,000,000, abundant 1,000,000+.

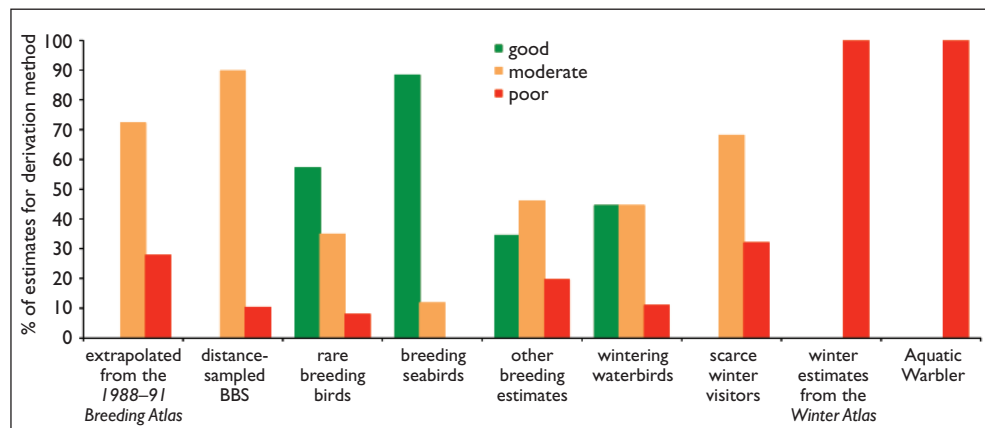


Fig. 2. The variation of confidence in estimate reliability by method of derivation; all estimates.

these doubts were compounded by imprecision in the trends used to extrapolate forward to the present day. The use of BBS data, through updates of the estimates published in Newson *et al.* (2008), enables a new approach based on the BBS's stratified random sampling, and should thus be free of concerns about bias in density estimates. However, this approach raises new issues, most notably how the estimate of individuals derived from BBS data relate to the number of pairs published here. The assumption that the number of pairs is half the number of individuals estimated may be sufficiently robust for some species, such as Wood Pigeon *Columba palumbus*, for which there is little difference in the detectability of the sexes. But in many species males are more detectable than females. This information is essential for accurate conversion of density estimates to population estimates, but is currently lacking for most species. A modification to the BBS requiring surveyors to record the sex of birds, when known, or whether birds were singing, would enable this issue to be tackled with more certainty.

In a number of cases, this new approach has produced larger estimates for species than hitherto (i.e. in APEP 2), sometimes for species we know to have declined in the intervening years. These new estimates suggest that we had underestimated their population sizes previously. Given such changes in methodology and knowledge, for these and many other estimates, we would strongly recommend against making comparisons between estimates from different APEP assessments to calculate trends.

Beyond these broad issues that affect many

species, often related to the monitoring schemes that estimates are derived from, there are many species-specific issues that give rise to reliability scores of 3. There are several contenders for the least reliable estimate presented here, such as breeding Water Rail and Rock Pipit, and non-breeding Jack Snipe *Lymnocyptes minimus*, Woodcock *Scolopax rusticolus*, Common Snipe *Gallinago gallinago*, Fieldfare, Redwing and Brambling. For such species, what we present is essentially a best guess, informed by scant data; and it is crucial to bear in mind the reliability scores when using these estimates. And beyond that, there is a story in those estimates which we do not even attempt to present; for example, we know that many common resident species are



Tom Marshall (rspb-images.com)

63. Meadow Pipit *Anthus pratensis*, Tiree, Argyll, June 2007. The 'Scottish' Meadow Pipit *A. p. whistleri* is an endemic subspecies, but one that is very poorly known in terms of its distribution.

supplemented by immigrants in the non-breeding season, in some cases substantially so, but at present we have no idea of the numbers involved, nor a mechanism in place to improve our understanding.

Recommendations: actions to improve population estimates

We are proud of the wealth of knowledge that underpins this report, but there is much to do to improve matters further. This is an ideal opportunity to promote the value of population estimates and encourage efforts to improve reliability – in order to have fewer ‘3’s and more ‘1’s in the next APEP report.

This section highlights some of the most obvious shortfalls in current knowledge, including generic issues affecting large numbers of species, others for particular species groups, and yet more for a number of individual species. While the APEP is concerned specifically with estimating population size, some of the missing information relates to this indirectly. For example, further information on population delineation, taxonomic status, or population densities (either in general or in poorly surveyed habitats) is often required before robust population esti-

mates can be made. Furthermore, some of these recommendations relate not to counts of birds but to data gathered in other ways, such as by capture and marking.

The following list is not exhaustive, it simply highlights priorities that could be progressed over the coming few years. Some of these relate to large-scale surveys that require adequate funding and some level of professional input, others are small-scale studies that could be undertaken locally by volunteers; progress on both fronts is important.

- *Breeding ducks* Perhaps surprisingly, we currently have poor data on the breeding populations of a number of species: Common Shelduck *Tadorna tadorna*, Mandarin Duck, Gadwall *Anas strepera*, Eurasian Teal, Eider, Red-breasted Merganser and Goosander *Mergus merganser* among them. The variety of habitats and the different ranges of these species mean that an entirely generic approach is unlikely to work and bespoke surveys will be required.
- *Upland waders* Although upland waders are well suited to estimation by BBS distance analyses, the poor coverage of upland areas by BBS means that sample



David Tipling/FLPA

64. Blackbird *Turdus merula*, Norfolk, December 2010. The Blackbird is one of the most common and familiar UK breeding birds, but we have little idea of the numbers of immigrants that spend the winter in our countryside.



Roger Riddington

65. Wren *Trogodytes troglodytes*, Shetland, May 2011. The Wren is the UK's commonest breeding bird, with an estimated population of around 8.6 million pairs. A number of variably well-defined island populations include *T. t. zetlandicus* in Shetland (shown here).

sizes are small, and targeted national surveys have never been conducted for breeding species such as the Dunlin *Calidris alpina*, although local (designated site) surveys have been carried out.

- *Seabirds in the non-breeding season* ('at sea') Numbers of both wintering and migrant seabirds in our waters are poorly known, not surprisingly given the obvious logistical challenges in survey work. There have been increasing efforts in recent years, notably surrounding the globally threatened Balearic Shearwater *Puffinus mauretanicus*, but how many skuas or Little Gulls *Hydrocoloeus minutus* are there?
- *Other marine waterbirds* Similarly, numbers of most inshore marine waterbirds, such as seaducks and divers, are poorly known during the non-breeding season. Site-based surveys in the past decade have improved our knowledge substantially but there are still major gaps in our understanding of population delineation and overall abundance. A co-ordinated programme of migration studies and surveys is needed.
- *Dispersed wintering waterbirds* Wetland species such as Mallard *Anas platyrhynchos* and Moorhen occur in small or dis-

persed wetland habitats such as ditches, small ponds and linear wetlands. In some cases, these habitats support a high proportion of the total population and thus data from WeBS do not provide a good basis for population estimation. Detailed studies in some areas have provided the basis for extrapolation at a national level (Musgrove *et al.* 2011), but more of these are needed, particularly in some key areas such as southwest England, Wales and Scotland.

- *Wintering gulls* Gulls are numerous and widespread, and the UK holds internationally important numbers of several species, some of which appear to be declining. Wintering gulls generally forage away from wetlands during the day and are not adequately covered by WeBS. More targeted surveys, based on counts at roosts (e.g. Banks *et al.* 2007), exist but are infrequent. Robust annual monitoring, particularly at key sites, augmented by more comprehensive counts at roosts every few years, is needed.
- *Breeding owls* Surveys of nocturnal species are always challenging and the most reliable data exist for the Little Owl *Athene noctua*, the least nocturnal species. Long-eared and Short-eared Owls have recently

been added to the RBBP list but it is unclear whether this will improve the adequacy of data collected, while the Barn Owl has not been surveyed since 1995–97, since when there is thought to have been a substantial but unquantified population increase. The Tawny Owl estimate presented here is also based on assumptions that would benefit from further testing.

- *BBS distance sampling* As outlined above, new analyses of BBS distance data are a significant development, particularly for those species where existing density estimates were thought to be unreliable, such as the urban and upland birds that were covered poorly by the CBC. However, there remains much work to be done, particularly on the detectability of birds and biases due to the non-random selection of BBS transect routes (albeit within randomly selected squares), to improve this approach.
- *Age of first breeding* Knowing how the number of individuals in a given population relates to the number of breeding pairs is strongly dependent on this statistic. This is particularly important when breeding-season surveys measure the number of individuals, or when we attempt to estimate breeding populations

of resident birds from counts made in winter.

- *Winter numbers of widespread species* As mentioned previously, we have extremely poor knowledge of the population size of widely dispersed species in the winter, both ‘resident’ species, whose numbers are swelled by massive (but unquantified) immigration such as the Blackbird, and also species more commonly regarded as winter visitors such as Fieldfare, Redwing and Brambling.
- *Winter raptors and owls* Despite good monitoring of many winter roosts of Hen Harrier, coverage is far from complete, and our understanding of the wintering numbers of Merlin *Falco columbarius*, Long-eared and Short-eared Owls is even more limited.
- *Individual species* There are a number of species, currently very poorly known, which can be tackled only by targeted, species-specific studies. Some of the most obvious examples include Ptarmigan *Lagopus muta*, Water Rail (breeding and non-breeding), Jack Snipe (non-breeding) and Common Snipe, Kingfisher, Sand Martin *Riparia riparia* and Rock Pipit.

Some of the work required to tackle these shortfalls requires considerable funding,



Tony Hamblin/FLPA

66. Brambling *Fringilla montifringilla*, Warwickshire, December 2007. Widespread and familiar, yet poorly known in terms of numbers – a comment that can be applied to many wintering passerines.

particularly at a national level. However, in many cases specific local studies would also provide invaluable estimates, which could be combined with other information to extrapolate to a national scale. Many of these could be undertaken by volunteers, and yield results of direct relevance to national population estimates – for example studies of the age of first breeding, or densities within specific habitats or regions. Ringers also have an important part to play, for example in estimating trends in abundance through capture-recapture studies of birds with low detectability during standard surveys, such as the Water Rail and possibly snipes.

A simple example is that of passerine species such as Whinchat *Saxicola rubetra* and Rock Pipit, for which there have never been national censuses, and for which there are no well-founded baseline estimates. These species are not well monitored by national schemes (such as BBS). The most comprehensive datasets available are the national breeding atlases, but these do not allow accurate estimates of population size. Some local studies of breeding density would provide data that could be extrapolated across the known range based on atlas data. This type of project is ideally carried out by keen volunteer birdwatchers with good local knowledge, perhaps with support on study design and methods from professional ornithologists, and would make an invaluable contribution to national ornithological knowledge and conservation.

In compiling this report we attempted, where possible, to look for population estimates of endemic subspecies. Although this was possible in some cases, a number of apparently endemic subspecies remain for which it was not possible to derive suitable estimates. This is largely due to a lack of understanding of the distribution, or in some cases even the validity, of these subspecies. Particular questions of relevance to the generation of population estimates are as follows:

- Coal Tit *Periparus ater*: where is the dividing line in northeast Ireland between *britannicus* and *hibernicus*?
- Dipper *Cinclus cinclus*: what are the precise distributions of *hibernicus* and *gularis* Dippers in western Scotland?

- Meadow Pipit *Anthus pratensis*: what is the distribution of *whistleri* in western Scotland?
- Linnet *Carduelis cannabina*: is the ‘Scottish’ Linnet *autochthona* really clearly demarcated from nominate *cannabina* along the English border?
- Yellowhammer *Emberiza citrinella*: where is the dividing line between *caliginosa* Yellowhammers in the northwest and nominate Yellowhammers in the south-east?

In each of these cases there is unlikely to be a sharp demarcation between two forms. However, further work on the validity and distribution of the UK’s apparently endemic forms would be a necessary prerequisite for the generation of population estimates.

APEP: the future

At present, we have striven to provide both GB and UK estimates. With the increased devolution of responsibility for conservation delivery to the UK’s four nations, we did consider country-specific estimates. This might be possible for a few species, particularly those that have been the focus of single-species surveys or receive a high level of reporting through the RBBP; but for most species, reporting for individual countries would compound the problems faced when producing UK estimates, particularly outside England where numbers of volunteers, and hence survey sample sizes, are lower.

We hope that our thoughts above might stimulate an interest in improving population estimates for birds in the UK, and we encourage observers to take on studies to tackle some of the thorny issues. In line with the new European reporting requirements, we intend to revise and publish compilations of population estimates every six years; our intention is to produce *APEP 4* in late 2018, in order to inform the UK’s next report to the European Union in 2019. In the intervening period, we intend to continue work examining the problems with population estimation, and encouraging efforts to resolve them. In particular, we anticipate that *APEP 4* will be strongly influenced by more detailed analyses of *Bird Atlas 2007–11* in the coming years. However, we reiterate that production of population estimates does not have to be

the sole preserve of professional ornithologists and we invite all observers with an interest in this area of work, on any species, to identify potential projects and to seek advice and support from APEP if necessary.

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Appendix I. Population estimates of birds in Great Britain and the United Kingdom.

Key: Species: * denotes a species with one or more distinct subspecies or populations, listed in Appendix 2. Region: GB = Great Britain; IoM = Isle of Man; UK = United Kingdom; * denotes a strict GB/UK estimate excluding IoM. Season: B = Breeding; P = Passage; W = Wintering. Unit: AOS = Apparently Occupied Sites; F = females; I = individuals; M = males; N = nests; P = pairs; T = territories. Der (Derivation): Numbers correspond to the appropriate section of the Methods; see text. Rel (Reliability): 1 (good) to 3 (poor); see text for full explanation. +/-: + = population known to be larger than estimate listed, but no better estimate available; - = population known to be smaller than estimate listed. Note: Numbers refer to the footnotes of the table. Ref: Numbers correspond to those given in the References section.

Species	Region	Season	Estimate	Unit	Date	Der	Rel	+/-	Note	Ref
Mute Swan <i>Cygnus olor</i>	GB	B	6,000 (5,400–6,600)	P	2009	5–BBS	2			80
	UK	B	6,400 (5,800–7,000)	P	2009	5–BBS	2			80
	GB	W	74,000	I	2004/05–08/09	6	2			57
	UK	W	79,000	I	2004/05–08/09	6	2			57
Bewick's Swan <i>Cygnus columbianus</i>	GB/UK	W	7,000	I	2005	6	1			83
Whooper Swan <i>Cygnus cygnus</i>	GB	B	8–12	P	2006–10	3	1			42
	UK	B	9–14	P	2006–10	3	1			42
	GB	W	11,000	I	2005	6	1			84
	UK	W	15,000	I	2005	6	1			84
Bean Goose <i>Anser fabalis</i> *	GB/UK	W	730	I	2004/05–09/10	6	1			57
Pink-footed Goose <i>Anser brachyrhynchus</i>	GB/UK	B	0–1	P	2006–10	3	1			42
	GB/UK	W	360,000	I	2009/10	6	1	-	1	53
White-fronted Goose <i>Anser albifrons</i> *	GB/UK	W	16,000	I	2004/05–09/10	6	1			57
Greylag Goose <i>Anser anser</i> *	GB/UK	B	46,000	P	2004–08	5	3			57
	GB	W	220,000	I	2004/05–09/10	6	2			53, 57
	UK	W	230,000	I	2004/05–09/10	6	2			53, 57
Snow Goose <i>Anser caerulescens</i>	GB/UK	B	3–5	P	2004–08	3	3	+	2	41
	GB/UK	W	180	I	2004/05–08/09	6	2			57
Canada Goose <i>Branta canadensis</i>	GB/UK	B	62,000	P	2004–08	5	3			57
	GB/UK	W	190,000	I	2004/05–08/09	6	2			57
Barnacle Goose <i>Branta leucopsis</i> *	GB	B	900	P	2004–08	5	3	-	3	57
	UK	B	1,000	P	2004–08	5	3	-	3	57
	GB/UK	W	94,000	I	2004/05–09/10	6	1			37, 54, 57
Brent Goose <i>Branta bernicla</i> *	GB	W	95,000	I	2004/05–08/09	6	1			57
	UK	W	120,000	I	2004/05–08/09	6	1			57
Egyptian Goose <i>Alopochen aegyptiaca</i>	GB/UK	B	1,100	P	2004–08	5	3			57
	GB/UK	W	3,400	I	2004/05–08/09	6	2			57
Common Shelduck <i>Tadorna tadorna</i>	GB/UK	B	15,000	P	2009	1–Eng	2	+	4	32
	GB	W	61,000	I	2004/05–08/09	6	1			57
	UK	W	66,000	I	2004/05–08/09	6	1			57
Mandarin Duck <i>Aix galericulata</i>	GB/UK	B	2,300	P	1988	5	3	+	5	18
	GB/UK	W	7,000	I	1988	6	3	+	6	18
Eurasian Wigeon <i>Anas penelope</i>	GB/UK	B	300–500	P	1968–72	5	2			67
	GB	W	440,000	I	2004/05–08/09	6	1			57
	UK	W	450,000	I	2004/05–08/09	6	1			57
American Wigeon <i>Anas americana</i>	GB/UK	W	8	I	2006/07–10/11	7	2			88
Gadwall <i>Anas strepera</i>	GB	B	670–1,710	P	2006–09	3	2	+	7	42
	UK	B	690–1,730	P	2006–09	3	2	+	7	42
	GB/UK	W	25,000	I	2004/05–08/09	6	1			57
Eurasian Teal <i>Anas crecca</i>	GB	B	1,500–2,600	P	1988–91	1	3			32
	UK	B	1,600–2,800	P	1988–91	1	3			32
	GB	W	210,000	I	2004/05–08/09	6	2			57
	UK	W	220,000	I	2004/05–08/09	6	2			57
Green-winged Teal <i>Anas carolinensis</i>	GB	W	23	I	2006/07–10/11	7	2			88
	UK	W	25	I	2006/07–10/11	7	2			88

Species	Region	Season	Estimate	Unit	Date	Der	Rel	+/-	Note	Ref
Mallard <i>Anas platyrhynchos</i>	GB	B	59,000–142,000	P	2009	5–UK	3	+	8	3
	UK	B	61,000–146,000	P	2009	5–UK	3	+	8	3
	GB	W	680,000	I	2004/05–08/09	6	3			57
	UK	W	710,000	I	2004/05–08/09	6	3			57
Pintail <i>Anas acuta</i>	GB/UK	B	9–33	P	2006–10	3	1			42
	GB/UK	W	29,000	I	2004/05–08/09	6	1			57
Garganey <i>Anas querquedula</i>	GB	B	13–91	P	2006–10	3	2			42
	UK	B	14–93	P	2006–10	3	2			42
Shoveler <i>Anas clypeata</i>	GB	B	310–1,010	P	2006–10	3	2			42
	UK	B	310–1,020	P	2006–10	3	2			42
	GB/UK	W	18,000	I	2004/05–08/09	6	1			57
Red-crested Pochard <i>Netta rufina</i>	GB/UK	B	10–21	P	2004–08	3	3	+	9	41
	GB/UK	W	320	I	2004/05–08/09	6	1			57
Common Pochard <i>Aythya ferina</i>	GB	B	330–610	P	2006–10	3	2			42
	UK	B	350–630	P	2006–10	3	2			42
	GB	W	38,000	I	2004/05–08/09	6	1			57
	UK	W	48,000	I	2004/05–08/09	6	1			57
Ring-necked Duck <i>Aythya collaris</i>	GB	W	14	I	2006/07–10/11	7	2			88
	UK	W	18	I	2006/07–10/11	7	2			88
Ferruginous Duck <i>Aythya nyroca</i>	GB	W	9	I	2006/07–10/11	7	2			88
	UK	W	10	I	2006/07–10/11	7	2			88
Tufted Duck <i>Aythya fuligula</i>	GB	B	16,000–18,000	P	2009	1–Eng	3			64
	UK	B	16,000–19,000	P	2009	1–Eng	3			64
	GB	W	110,000	I	2004/05–08/09	6	1			57
	UK	W	120,000	I	2004/05–08/09	6	1			57
Greater Scaup <i>Aythya marila</i>	GB	W	5,200	I	2004/05–08/09	6	2			57
	UK	W	12,000	I	2004/05–08/09	6	2			57
Common Eider <i>Somateria mollissima</i> *	GB	B	26,000	P	2004–09	5	2		10	32, 57
	UK	B	27,000	P	2004–09	5	2		10	32, 57
	GB	W	60,000	I	2004/05–09/10	6	2			57
	UK	W	63,000	I	2004/05–09/10	6	2			57
Long-tailed Duck <i>Clangula hyemalis</i>	GB/UK	W	11,000	I	2004/05–08/09	6	2	-	11	57
Common Scoter <i>Melanitta nigra</i>	GB/UK	B	52	P	2007	5	1			40
	GB/UK	W	100,000	I	2004/05–08/09	6	2			57
Surf Scoter <i>Melanitta perspicillata</i>	GB/UK	W	13	I	2006/07–10/11	7	2			88
Velvet Scoter <i>Melanitta fusca</i>	GB/UK	W	2,500	I	2004/05–08/09	6	2	-	12	57
Common Goldeneye <i>Bucephala clangula</i>	GB/UK	B	200	F	2006–10	3	2			42
	GB	W	20,000	I	2004/05–08/09	6	2			57
	UK	W	27,000	I	2004/05–08/09	6	2			57
Smew <i>Mergellus albellus</i>	GB/UK	W	180	I	2004/05–08/09	6	1			57
Red-breasted Merganser <i>Mergus serrator</i>	GB	B	2,200	P	1988–91	1	3	+	13	1, 32
	UK	B	2,400	P	1988–91	1	3	+	13	1, 32
	GB	W	8,400	I	2004/05–08/09	6	2			57
	UK	W	9,000	I	2004/05–08/09	6	2			57
Goosander <i>Mergus merganser</i>	GB/UK	B	3,500 (3,100–3,800)	P	2009	5–WBS/ WBBS	2	+	14	1, 36
	GB/UK	W	12,000	I	2004/05–08/09	6	2			57
Ruddy Duck <i>Oxyura jamaicensis</i>	GB/UK	W	60	I	2012	5	1			39
Common Quail <i>Coturnix coturnix</i>	GB/UK	B	540	M	2006–10	3	2			42
Red-legged Partridge <i>Alectoris rufa</i>	GB/UK	B	82,000	T	2009	1–UK	2			32
Red Grouse <i>Lagopus lagopus</i>	GB/UK	B	230,000	P	2009	1–NGC/ BBS	3			32

Population estimates of birds in Great Britain and the United Kingdom

Species	Region	Season	Estimate	Unit	Date	Der	Rel	+/-	Note	Ref
Ptarmigan <i>Lagopus muta</i>	GB/UK	B	2,000–15,000	P	2007	5	2			28
Black Grouse <i>Tetrao tetrix</i>	GB/UK	B	5,100	M	2005	5	1			68
Capercaillie <i>Tetrao urogallus</i>	GB/UK	W	1,300 (800–1,900)	I	2009/10	5	2			25
Grey Partridge <i>Perdix perdix</i>	GB/UK	B	43,000	T	2009	1–UK	2			32
Common Pheasant <i>Phasianus colchicus</i>	GB	B	2,200,000	F	2009	1–Eng	2			66
	UK	B	2,300,000	F	2009	1–Eng	2			66
Lady Amherst's Pheasant <i>Chrysolophus amherstiae</i>	GB/UK	B	5	M	2006–10	3	1		15	41, 89
Golden Pheasant <i>Chrysolophus pictus</i>	GB/UK	B	50–100	P	2009	3	3		16	4, 35, 41, 75, 89
Red-throated Diver <i>Gavia stellata</i>	GB/UK	B	1,300 (1,000–1,600)	P	2006	5	1			20
	GB/UK	W	17,000	I	2001–06	6	2			62
Black-throated Diver <i>Gavia arctica</i>	GB/UK	B	220 (190–250)	P	2006	5	1			24
	GB/UK	W	560	I	2004/05–08/09	6	3			57
Great Northern Diver <i>Gavia immer</i>	GB	W	2,500	I	2004/05–08/09	6	3	+	17	57
	UK	W	2,600	I	2004/05–08/09	6	3	+	17	57
White-billed Diver <i>Gavia adamsii</i>	GB/UK	W	13	I	2006/07–10/11	7	3		18	88
Fulmar <i>Fulmarus glacialis</i>	GB/UK	B	500,000	P	1998–2002	4	1			55
Manx Shearwater <i>Puffinus puffinus</i>	GB	B	300,000 (280,000–310,000)	P	1998–2002	4	2			55
	UK	B	300,000 (280,000–320,000)	P	1998–2002	4	2			55
European Storm-petrel <i>Hydrobates pelagicus</i>	GB/UK	B	26,000 (21,000–33,000)	AOS	1998–2002	4	2			55
Leach's Storm-petrel <i>Oceanodroma leucorhoa</i>	GB/UK	B	48,000 (36,000–65,000)	AOS	1998–2002	4	2			55
Northern Gannet <i>Morus bassanus</i>	GB/UK	B	220,000	N	2003–04	4	1			79
Great Cormorant <i>Phalacrocorax carbo</i>	GB	B	8,400	P	1998–2002	4	1		19	55
	UK	B	9,000	P	1998–2002	4	1		19	55
	GB	W	35,000	I	2004/05–08/09	6	2		19	57
	UK	W	41,000	I	2004/05–08/09	6	2		19	57
Shag <i>Phalacrocorax aristotelis</i>	GB/UK	B	27,000	P	1998–2002	4	1			55
	GB/UK	W	110,000	I	1998–2002	6	2			57
Eurasian Bittern <i>Botaurus stellaris</i>	GB/UK	B	80	M	2007–11	3	1	+	20	42, 90
	GB/UK	W	600	I	2009/10	5	2			86
Little Bittern <i>Ixobrychus minutus</i>	GB/UK	B	0–1	P	2006–10	3	1			42
Cattle Egret <i>Bubulcus ibis</i>	GB/UK	B	0–1	P	2006–10	3	1			42
Little Egret <i>Egretta garzetta</i>	GB/UK	B	660–740	P	2006–10	3	2	+	21	42
	GB/UK	W	4,500	I	2004/05–08/09	6	2	+	22	57
Great White Egret <i>Ardea alba</i>	GB/UK	B	0–1	P	2008–12	3	1		23	42
	GB	W	34	I	2006/07–10/11	7	2			88
	UK	W	35	I	2006/07–10/11	7	2			88
Grey Heron <i>Ardea cinerea</i>	GB	B	12,000	P	2007–11	5	1			91
	UK	B	13,000	P	2007–11	5	1			91
	GB	W	61,000	I	2004/05–08/09	6	2			57
	UK	W	63,000	I	2004/05–08/09	6	2			57
Purple Heron <i>Ardea purpurea</i>	GB/UK	B	0–1	P	2006–10	3	1			42

Species	Region	Season	Estimate	Unit	Date	Der	Rel	+/-	Note	Ref
Eurasian Spoonbill	GB/UK	B	2	P	2006–10	3	1	+	24	42
<i>Platalea leucorodia</i>	GB/UK	W	20	I	2004/05–08/09	6	1			57
Little Grebe	GB	B	3,500–7,100	P	2009	1–WBS/ WBBS	2			32
<i>Tachybaptus ruficollis</i>	UK	B	3,900–7,800	P	2009	1–WBS/ WBBS	2			32
	GB	W	16,000	I	2004/05–08/09	6	2			57
	UK	W	17,000	I	2004/05–08/09	6	2			57
Great Crested Grebe	GB	B	4,600	P	2009	1–BBS	2	+	25	32
<i>Podiceps cristatus</i>	UK	B	5,300	P	2009	1–BBS	2	+	25	32
	GB	W	19,000	I	2004/05–08/09	6	1			57
	UK	W	23,000	I	2004/05–08/09	6	1			57
Red-necked Grebe	GB	W	55	I	2004/05–08/09	6	2			57
<i>Podiceps grisegena</i>	UK	W	57	I	2004/05–08/09	6	2			57
Slavonian Grebe	GB/UK	B	30	P	2006–10	3	1			42
<i>Podiceps auritus</i>	GB/UK	W	1,100	I	2004/05–08/09	6	2			57
Black-necked Grebe	GB/UK	B	32–51	P	2006–10	3	1			42
<i>Podiceps nigricollis</i>	GB/UK	W	130	I	2004/05–08/09	6	1			57
Honey-buzzard	GB/UK	B	33–69	P	2000	5	2			7, 63
<i>Pernis apivorus</i>										
Red Kite <i>Milvus milvus</i>	GB/UK	B	1,600	P	2006–10	3	2	+	26	42
White-tailed Eagle	GB/UK	B	37–44	P	2006–10	3	1	+	27	42
<i>Haliaeetus albicilla</i>										
Marsh Harrier	GB/UK	B	320–380	P	2006–10	3	2	+	28	42
<i>Circus aeruginosus</i>										
Hen Harrier	GB*	B	570 (490–680)	P	2010	5	1			42
<i>Circus cyaneus</i>	IoM	B	29	P	2010	5	1			42
	UK*	B	630 (550–740)	P	2010	5	1			42
Montagu's Harrier	GB/UK	B	12–16	P	2006–10	3	1			42
<i>Circus pygargus</i>										
Northern Goshawk	GB	B	280–420	P	2006–10	3	2	+	29	42
<i>Accipiter gentilis</i>	UK	B	280–430	P	2006–10	3	2	+	29	42
Eurasian Sparrowhawk	GB	B	33,000	P	2009	1–Eng	2			59
<i>Accipiter nisus</i>	UK	B	35,000	P	2009	1–Eng	2			59
Common Buzzard	GB	B	56,000–77,000	P	2009	5–BBS	2			13
<i>Buteo buteo</i>	UK	B	57,000–79,000	P	2009	5–BBS	2			13
Rough-legged Buzzard	GB/UK	W	32	I	2006/07–10/11	7	3			88
<i>Buteo lagopus</i>										
Golden Eagle	GB/UK	B	440	P	2003	5	1			23
<i>Aquila chrysaetos</i>										
Osprey	GB/UK	B	200–250	P	2006–10	3	2		30	42
<i>Pandion haliaetus</i>										
Common Kestrel	GB	B	45,000	P	2009	1–Eng	2			32
<i>Falco tinnunculus</i>	UK	B	46,000	P	2009	1–Eng	2			32
Merlin	GB	B	1,100	P	2008	5	2			26
<i>Falco columbarius</i>			(900–1,500)							
	UK	B	1,200	P	2008	5	2			26
			(900–1,500)							
Hobby <i>Falco subbuteo</i>	GB/UK	B	2,800	P	2009	5–BBS	2			12
Peregrine Falcon	GB*	B	1,400	P	2002	5	1			6
<i>Falco peregrinus</i>	IoM	B	31	P	2002	5	1			6
	UK*	B	1,500	P	2002	5	1			6
Water Rail	GB/UK	B	1,100	T	2006–10	3	3	+	31	42
<i>Rallus aquaticus</i>										
Spotted Crane	GB/UK	B	80	M	1999	5	1	-	32	33, 72
<i>Porzana porzana</i>										
Corn Crane <i>Crex crex</i>	GB/UK	B	1,200	M	2006–10	3	1			42

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Species	Region	Season	Estimate	Unit	Date	Der	Rel	+/-	Note	Ref
Moorhen	GB	B	260,000	T	2009	1-UK	2			32
<i>Gallinula chloropus</i>	UK	B	270,000	T	2009	1-UK	2			32
	GB	W	320,000	I	2004/05-08/09	6	3			57
	UK	W	330,000	I	2004/05-08/09	6	3			57
Common Coot	GB	B	30,000	P	2009	1-UK	3	+	33	32
<i>Fulica atra</i>	UK	B	31,000	P	2009	1-UK	3	+	33	32
	GB	W	180,000	I	2004/05-08/09	6	1			57
	UK	W	190,000	I	2004/05-08/09	6	1			57
Common Crane <i>Grus grus</i>	GB/UK	B	9-14	P	2006-10	5	1			69
	GB/UK	W	52	I	2009/10	5	1			69
Great Bustard <i>Otis tarda</i>	GB/UK	B	2	P	2006-10	3	1		34	42
Stone-curlew <i>Burhinus oedinenemus</i>	GB/UK	B	350	P	2006-10	3	1	+	35	42
Black-winged Stilt <i>Himantopus himantopus</i>	GB/UK	B	0-1	P	2006-10	3	1			42
Avocet	GB/UK	B	1,500	P	2006-10	3	1			42
<i>Recurvirostra avosetta</i>	GB/UK	W	7,500	I	2004/05-08/09	6	1			57
Oystercatcher	GB/UK	B	110,000	P	2009	5-BBS	2			61
<i>Haematopus ostralegus</i>	GB	W	320,000	I	2004/05-08/09	6	1			57
	UK	W	340,000	I	2004/05-08/09	6	1			57
European Golden Plover	GB/UK	B	38,000-59,000	P	1980-2000	5	2			77
<i>Pluvialis apricaria</i>	GB	W	400,000	I	2006/07	6	2			34
	UK	W	420,000	I	2006/07	6	2			34
Grey Plover <i>Pluvialis squatarola</i>	GB/UK	W	43,000	I	2004/05-08/09	6	1			57
Northern Lapwing	GB	B	130,000	P	2009	5-BBS	2			61
<i>Vanellus vanellus</i>	UK	B	140,000	P	2009	5-BBS	2			61
	GB	W	620,000	I	2006/07	6	2			34
	UK	W	650,000	I	2006/07	6	2			34
Little Ringed Plover <i>Charadrius dubius</i>	GB/UK	B	1,200 (1,200-1,300)	P	2007	5	1			15
Ringed Plover <i>Charadrius hiaticula</i>	GB*	B	5,300 (5,100-5,500)	P	2007	5	1			15
	UK*	B	5,400 (5,300-5,600)	P	2007	5	1			15
	IoM	B	150 (140-160)	P	2007	6	1			15
	GB	W	34,000	I	2004/05-08/09	6	1			57
	UK	W	36,000	I	2004/05-08/09	6	1			57
Dotterel <i>Charadrius morinellus</i>	GB/UK	B	630 (510-750)	M	1999	5	2			81
Whimbrel <i>Numenius phaeopus</i>	GB/UK	B	400-500	P	2007	5	3			28
	GB/UK	W	30	I	2004/05-08/09	6	1			57
Eurasian Curlew <i>Numenius arquata</i>	GB	B	66,000	P	2009	5-BBS	2			61
	UK	B	68,000	P	2009	5-BBS	2			61
	GB	W	140,000	I	2004/05-08/09	6	1			57
	UK	W	150,000	I	2004/05-08/09	6	1			57
Black-tailed Godwit <i>Limosa limosa *</i>	GB/UK	B	61-66	P	2006-10	3	1			42
	GB	W	43,000	I	2004/05-08/09	6	1			57
	UK	W	44,000	I	2004/05-08/09	6	1			57
Bar-tailed Godwit <i>Limosa lapponica</i>	GB	W	38,000	I	2004/05-08/09	6	1			57
	UK	W	41,000	I	2004/05-08/09	6	1			57
Turnstone <i>Arenaria interpres</i>	GB	W	48,000	I	2004/05-08/09	6	1			57
	UK	W	51,000	I	2004/05-08/09	6	1			57
Red Knot <i>Calidris canutus</i>	GB	W	320,000	I	2004/05-08/09	6	1			57
	UK	W	330,000	I	2004/05-08/09	6	1			57
Ruff <i>Calidris pugnax</i>	GB/UK	B	0-11	F	2006-10	3	1		36	42
	GB	W	800	I	2004/05-08/09	6	1			57
	UK	W	820	I	2004/05-08/09	6	1			57
Sanderling <i>Calidris alba</i>	GB	W	16,000	I	2004/05-08/09	6	1			57
	UK	W	17,000	I	2004/05-08/09	6	1			57

Species	Region	Season	Estimate	Unit	Date	Der	Rel	+/-	Note	Ref
Dunlin	GB/UK	B	8,600–10,600	P	2005–07	5	2		37	11, 28, 44
<i>Calidris alpina</i>	GB	W	350,000	I	2004/05–08/09	6	1			57
	UK	W	360,000	I	2004/05–08/09	6	1			57
Purple Sandpiper	GB/UK	B	1	P	2006–10	3	1			42
<i>Calidris maritima</i>	GB/UK	W	13,000	I	2004/05–08/09	6	2			57
Little Stint <i>Calidris minuta</i>	GB/UK	W	14	I	2004/05–08/09	6	1			57
Red-necked Phalarope	GB/UK	B	20–24	M	2006–10	3	1			42
<i>Phalaropus lobatus</i>										
Common Sandpiper	GB/UK	B	15,000	P	2009	5–WBS/WBBS	2			22
<i>Actitis hypoleucos</i>	GB/UK	W	73	I	2004/05–08/09	6	1			57
Green Sandpiper	GB/UK	B	1–3	P	2006–10	3	1			42
<i>Tringa ochropus</i>	GB/UK	W	910	I	2004/05–08/09	6	3			57
Spotted Redshank	GB/UK	W	98	I	2004/05–08/09	6	1			57
<i>Tringa erythropus</i>										
Greenshank	GB/UK	B	1,100	P	1995	5	2	+	38	38
<i>Tringa nebularia</i>			(700–1,500)							
	GB	W	610	I	2004/05–08/09	6	1			57
	UK	W	770	I	2004/05–08/09	6	1			57
Wood Sandpiper	GB/UK	B	11–27	P	2007	5	1			40
<i>Tringa glareola</i>										
Common Redshank	GB	B	24,000	P	2009	5–BBS	2			61
<i>Tringa totanus</i>	UK	B	25,000	P	2009	5–BBS	2			61
	GB	W	120,000	I	2004/05–08/09	6	1			57
	UK	W	130,000	I	2004/05–08/09	6	1			57
Jack Snipe	GB	W	100,000	I	2004/05	6	3			57
<i>Lymnocyrtus minimus</i>	UK	W	110,000	I	2004/05	6	3			57
Woodcock	GB	B	78,000	M	2003	5	2			43
<i>Scolopax rusticola</i>			(62,000–96,000)							
	UK	B	81,000	M	2003	5	2			43
			(64,000–100,000)							
	GB/UK	W	1,400,000	I	2003/04	6	3			57
Common Snipe	GB	B	76,000	P	2009	5–BBS	3			61
<i>Gallinago gallinago</i>	UK	B	80,000	P	2009	5–BBS	3			61
	GB	W	1,000,000	I	2004/05	6	3			57
	UK	W	1,100,000	I	2004/05	6	3			57
Arctic Skua	GB/UK	B	2,100	P	1998–2002	4	1	-	39	55
<i>Stercorarius parasiticus</i>										
Great Skua	GB/UK	B	9,600	P	1998–2002	4	1			55
<i>Stercorarius skua</i>										
Puffin <i>Fratercula arctica</i>	GB/UK	B	580,000	P	1998–2002	4	1			55
Black Guillemot	GB/UK	B	19,000	P	1998–2003	4	1		40	55
<i>Cephus grylle</i>										
Razorbill	GB	B	110,000	P	1998–2002	4	1		41	55
<i>Alca torda</i>	UK	B	130,000	P	1998–2002	4	1		41	55
Common Guillemot	GB	B	880,000	P	1998–2002	4	1		41	55
<i>Uria aalge</i>	UK	B	950,000	P	1998–2002	4	1		41	55
Little Tern	GB/UK	B	1,900	P	2000	4	1			55
<i>Sternula albifrons</i>										
Sandwich Tern	GB	B	11,000	P	2000	4	1			55
<i>Sterna sandvicensis</i>	UK	B	12,000	P	2000	4	1			55
Common Tern	GB	B	10,000	P	2000	4	1			55
<i>Sterna hirundo</i>	UK	B	12,000	P	2000	4	1			55
Arctic Tern	GB/UK	B	53,000	P	2000	4	1			55
<i>Sterna paradisaea</i>										
Roseate Tern	GB	B	86	P	2006–10	3	1			42
<i>Sterna dougallii</i>	UK	B	89	P	2006–10	3	1			42
Kittiwake	GB	B	370,000	P	1998–2002	4	1	-	39	55
<i>Rissa tridactyla</i>	UK	B	380,000	P	1998–2002	4	1	-	39	55

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Black-headed Gull	GB	B	130,000	P	1998–2002	4	1	+	42	55
<i>Chroicocephalus ridibundus</i>	UK	B	140,000	P	1998–2002	4	1	+	42	55
	GB*	W	2,200,000 (2,100,000–2,200,000)	I	2003/04–05/06	6	2			5
	UK*	W	2,200,000 (2,100,000–2,300,000)	I	2003/04–05/06	6	2			5
Little Gull	GB/UK	B	0–1	P	2006–10	3	1			42
<i>Hydrocoloeus minutus</i>										
Mediterranean Gull	GB/UK	B	600–630	P	2006–10	3	1			42
<i>Larus melanocephalus</i>	GB/UK	W	1,800	I	2004/05–08/09	6	2			57
Ring-billed Gull	GB	W	17	I	2006/07–10/11	7	2			88
<i>Larus delawarensis</i>	UK	W	22	I	2006/07–10/11	7	2			88
Common Gull	GB	B	48,000	P	1998–2002	4	1			55
<i>Larus canus</i>	UK	B	49,000	P	1998–2002	4	1			55
	GB*	W	700,000 (670,000–720,000)	I	2003/04–05/06	6	2			5
	UK*	W	710,000 (680,000–730,000)	I	2003/04–05/06	6	2			5
Caspian Gull	GB/UK	W	90	I	2004/05–08/09	6	2			57
<i>Larus cachinnans</i>										
Lesser Black-backed Gull	GB/UK	B	110,000	P	1998–2002	4	1	-	39	55
<i>Larus fuscus</i>	GB*	W	120,000 (120,000–130,000)	I	2003/04–05/06	6	2			5
	UK*	W	130,000 (120,000–130,000)	I	2003/04–05/06	6	2			5
Glaucous Gull	GB	W	150	I	2004/05–08/09	6	2			57
<i>Larus hyperboreus</i>	UK	W	170	I	2004/05–08/09	6	2			57
Iceland Gull	GB	W	210	I	2004/05–08/09	6	2			57
<i>Larus glaucooides</i>	UK	W	240	I	2004/05–08/09	6	2			57
Yellow-legged Gull	GB/UK	B	1	P	2006–10	3	1			42
<i>Larus michahellis</i>	GB/UK	W	1,100	I	2004/05–08/09	6	2			57
Herring Gull	GB*	B	130,000	P	1998–2002	4	1	-	39	55
<i>Larus argentatus</i>	IoM	B	7,100	P	1998–2002	4	1	-	39	55
	UK*	B	140,000	P	1998–2002	4	1	-	39	55
	GB*	W	730,000 (700,000–760,000)	I	2003/04–05/06	6	2			5
	UK*	W	740,000 (710,000–780,000)	I	2003/04–05/06	6	2			5
Great Black-backed Gull	GB/UK	B	17,000	P	1998–2002	4	1	-	39	55
<i>Larus marinus</i>	GB*	W	76,000 (71,000–81,000)	I	2003/04–05/06	6	2			5
	UK*	W	77,000 (72,000–82,000)	I	2003/04–05/06	6	2			5
Rock Dove/Feral Pigeon	GB	B	540,000 (440,000–640,000)	P	2009	2	2		43	58
<i>Columba livia</i>	UK	B	550,000 (450,000–650,000)	P	2009	2	2		43	58
Stock Dove	GB/UK	B	260,000	T	2009	1–Eng	2			32
<i>Columba oenas</i>										
Wood Pigeon	GB	B	5,300,000 (5,000,000–5,600,000)	P	2009	2	2			58
<i>Columba palumbus</i>	UK	B	5,400,000 (5,100,000–5,700,000)	P	2009	2	2			58
Collared Dove	GB	B	980,000 (880,000–1,070,000)	P	2009	2	2			58
<i>Streptopelia decaocto</i>	UK	B	990,000 (900,000–1,090,000)	P	2009	2	2			58
Turtle Dove	GB/UK	B	14,000	T	2009	1–UK	2			32
<i>Streptopelia turtur</i>										
Rose-ringed Parakeet	GB/UK	B	8,600	P	2012	5	1		44	92
<i>Psittacula krameri</i>										

Species	Region	Season	Estimate	Unit	Date	Der	Rel	+/-	Note	Ref
Common Cuckoo <i>Cuculus canorus</i>	GB	B	15,000 (8,000–23,000)	P	2009	2	3	+	45	58
	UK	B	16,000 (9,000–24,000)	P	2009	2	3	+	45	58
Barn Owl <i>Tyto alba</i>	GB/UK	B	4,000 (3,000–5,000)	P	1995–97	5	3	+	46	78
Little Owl <i>Athene noctua</i>	GB/UK	B	5,700 (3,700–7,700)	P	2009	2	2			58
Tawny Owl <i>Strix aluco</i>	GB/UK	B	50,000	P	2005	5	2		47	29
Long-eared Owl <i>Asio otus</i>	GB	B	1,600–5,300	P	2007–11	5	3		48	67
	UK	B	1,800–6,000	P	2007–11	5	3		48	67
Short-eared Owl <i>Asio flammeus</i>	GB	B	610–2,140	P	2007–11	5	3		49	32
	UK	B	620–2,180	P	2007–11	5	3		49	32
European Nightjar <i>Caprimulgus europaeus</i>	GB/UK	B	4,600 (3,700–5,500)	M	2004	5	1			16
Common Swift <i>Apus apus</i>	GB	B	87,000 (63,000–111,000)	P	2009	2	3	+	50	58
	UK	B	87,000 (64,000–111,000)	P	2009	2	3	+	50	58
Common Kingfisher <i>Alcedo atthis</i>	GB	B	3,600–6,100	P	2009	1–WBS/ WBBS	3		51	32
	UK	B	3,800–6,400	P	2009	1–WBS/ WBBS	3		51	32
Green Woodpecker <i>Picus viridis</i>	GB/UK	B	52,000 (47,000–58,000)	P	2009	2	2			58
Great Spotted Woodpecker <i>Dendrocopos major</i>	GB/UK	B	140,000 (130,000–150,000)	P	2009	2	2			58
Lesser Spotted Woodpecker <i>Dendrocopos minor</i>	GB/UK	B	1,000–2,000	P	2009	1–UK	3		52	32
Golden Oriole <i>Oriolus oriolus</i>	GB/UK	B	2–5	P	2006–10	3	1			42
Red-backed Shrike <i>Lanius collurio</i>	GB/UK	B	1–3	P	2006–10	3	1			42
Great Grey Shrike <i>Lanius excubitor</i>	GB	W	62	I	2006/07–10/11	7	3			88
	UK	W	63	I	2006/07–10/11	7	3			88
Red-billed Cough <i>Pyrhcorax pyrrhcorax</i>	GB*/UK*	B	250–350	P	2002	5	1			27, 76
		B	930–940	I	2002	5	1			27, 76
		IoM	120–150	P	2002	5	1			56
		IoM	430	I	2002	5	1			56
Magpie <i>Pica pica</i>	GB	B	550,000	T	2009	1–UK	2			32
	UK	B	600,000	T	2009	1–UK	2			32
Eurasian Jay <i>Garrulus glandarius</i> *	GB/UK	B	170,000	T	2009	1–UK	2			32
Jackdaw <i>Corvus monedula</i>	GB	B	1,300,000 (1,100,000–1,400,000)	P	2009	2	2			58
	UK	B	1,400,000 (1,200,000–1,500,000)	P	2009	2	2			58
Rook <i>Corvus frugilegus</i>	GB	B	990,000 (860,000–1,130,000)	P	2009	5–BBS	2			48
	UK	B	1,100,000 (1,000,000–1,200,000)	P	2009	5–BBS	2			48
Carriion Crow <i>Corvus corone</i>	GB/UK	B	1,000,000	T	2009	1–Eng	2			32
Hooded Crow <i>Corvus cornix</i>	GB	B	160,000	T	2009	1–BBS	2			32
	UK	B	260,000	T	2009	1–BBS	2			32
Common Raven <i>Corvus corax</i>	GB	B	7,000	P	2009	1–BBS	3	+	53	32
	UK	B	7,400	P	2009	1–BBS	3	+	53	32

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Goldcrest	GB	B	520,000	T	2009	1-BBS	2			32
<i>Regulus regulus</i>	UK	B	610,000	T	2009	1-BBS	2			32
Firecrest	GB/UK	B	550	T	2006–10	3	2	+	54	42
<i>Regulus ignicapilla</i>										
Blue Tit	GB	B	3,400,000	T	2009	1-UK	2			32
<i>Cyanistes caeruleus</i>	UK	B	3,600,000	T	2009	1-UK	2			32
Great Tit	GB	B	2,500,000	T	2009	1-UK	2			32
<i>Parus major</i>	UK	B	2,600,000	T	2009	1-UK	2			32
Crested Tit	GB/UK	B	1,000–2,000	P	2007	5	2			28
<i>Lophophanes cristatus</i>										
Coal Tit	GB	B	680,000	T	2009	1-UK	2			32
<i>Periparus ater</i> *	UK	B	760,000	T	2009	1-UK	2			32
Willow Tit	GB/UK	B	3,400	P	2009	1-UK	2		55	32
<i>Poecile montana</i>										
Marsh Tit	GB/UK	B	41,000	T	2009	1-UK	2			32
<i>Poecile palustris</i>										
Bearded Tit	GB/UK	B	630	P	2006–10	3	2			42
<i>Panurus biarmicus</i>										
Woodlark	GB/UK	B	3,100 (2,500–3,700)	P	2006	5	1			17
<i>Lullula arborea</i>										
Skylark	GB	B	1,400,000	T	2009	1-Eng	2			32
<i>Alauda arvensis</i>	UK	B	1,500,000	T	2009	1-Eng	2			32
Shore Lark	GB/UK	W	74	I	2006/07–10/11	7	2			88
<i>Eremophila alpestris</i>										
Sand Martin	GB	B	49,000–159,000	N	2009	1-WBS/ WBBS	3		56	32
<i>Riparia riparia</i>	UK	B	54,000–174,000	N	2009	1-WBS/ WBBS	3		56	32
Barn Swallow	GB	B	760,000	T	2009	1-Eng	2			32
<i>Hirundo rustica</i>	UK	B	860,000	T	2009	1-Eng	2			32
House Martin	GB	B	510,000 (360,000–660,000)	P	2009	2	2			58
<i>Delichon urbicum</i>	UK	B	510,000 (360,000–670,000)	P	2009	2	2			58
Cetti's Warbler	GB/UK	B	2,000	M	2006–10	3	2	+	57	42
<i>Cettia cetti</i>										
Long-tailed Tit	GB	B	330,000	T	2009	1-Eng	2			32
<i>Aegithalos caudatus</i>	UK	B	340,000	T	2009	1-Eng	2			32
Yellow-browed Warbler	GB/UK	W	8	I	2006/07–10/11	7	2		58	88
<i>Phylloscopus inornatus</i>										
Wood Warbler	GB/UK	B	6,500 (5,900–7,000)	M	2009	1-BBS	3		59	9
<i>Phylloscopus sibilatrix</i>										
Common Chiffchaff	GB	B	1,100,000	T	2009	1-UK	2			32
<i>Phylloscopus collybita</i>	UK	B	1,200,000	T	2009	1-UK	2			32
Willow Warbler	GB	B	2,200,000	T	2009	1-BBS	2			32
<i>Phylloscopus trochilus</i>	UK	B	2,400,000	T	2009	1-BBS	2			32
Blackcap	GB	B	1,100,000	T	2009	1-UK	2			32
<i>Sylvia atricapilla</i>	UK	B	1,200,000	T	2009	1-UK	2			32
Garden Warbler	GB/UK	B	170,000	T	2009	1-UK	2			32
<i>Sylvia borin</i>										
Lesser Whitethroat	GB/UK	B	74,000	T	2009	1-UK	2			32
<i>Sylvia curruca</i>										
Common Whitethroat	GB/UK	B	1,100,000	T	2009	1-UK	2			32
<i>Sylvia communis</i>										
Dartford Warbler	GB/UK	B	3,200 (2,900–3,600)	P	2006	5	1			87
<i>Sylvia undata</i>										

Species	Region	Season	Estimate	Unit	Date	Der	Rel	+/-	Note	Ref
Grasshopper Warbler	GB	B	13,000	T	2009	1-BBS	3		60	32
<i>Locustella naevia</i>	UK	B	16,000	T	2009	1-BBS	3		60	32
Savi's Warbler	GB/UK	B	1-3	P	2006-10	3	1			42
<i>Locustella luscinioides</i>										
Icterine Warbler	GB/UK	B	0-2	P	2006-10	3	1			42
<i>Hippolais icterina</i>										
Aquatic Warbler	GB/UK	P	10	I	2006-10	9	3	+	61	88, 89, 93, 94
<i>Acrocephalus paludicola</i>										
Sedge Warbler	GB	B	260,000	T	2009	1-UK	2			32
<i>Acrocephalus schoenobaenus</i>	UK	B	290,000	T	2009	1-UK	2			32
Marsh Warbler	GB/UK	B	2-8	P	2006-10	3	1			42
<i>Acrocephalus palustris</i>										
Reed Warbler	GB/UK	B	130,000 (100,000-160,000)	P	2009	2	2	+	45	58
<i>Acrocephalus scirpaceus</i>										
Waxwing	GB	W	10,000	I	2006/07-10/11	7	2		62	88
<i>Bombycilla garrulus</i>	UK	W	11,000	I	2006/07-10/11	7	2		62	88
Eurasian Nuthatch	GB/UK	B	220,000	T	2009	1-UK	2			32
<i>Sitta europaea</i>										
Eurasian Treecreeper	GB	B	180,000	T	2009	1-UK	2			32
<i>Certhia familiaris</i>	UK	B	200,000	T	2009	1-UK	2			32
Wren	GB	B	7,700,000	T	2009	1-UK	2			32
<i>Troglodytes troglodytes</i> *	UK	B	8,600,000	T	2009	1-UK	2			32
Common Starling	GB	B	1,800,000	P	2009	2	2			58
<i>Sturnus vulgaris</i> *			(1,600,000-2,000,000)							
	UK	B	1,900,000 (1,700,000-2,200,000)	P	2009	2	2			58
Dipper	GB	B	5,700-17,100	P	2009	1-WBS/ WBBS	2			32
<i>Cinclus cinclus</i> *	UK	B	6,200-18,700	P	2009	1-WBS/ WBBS	2			32
Ring Ouzel	GB/UK	B	6,200-7,500	P	1999	5	2			85
<i>Turdus torquatus</i>										
Blackbird	GB	B	4,900,000	P	2009	2	2			58
<i>Turdus merula</i>			(4,700,000-5,100,000)							
	UK	B	5,100,000 (4,900,000-5,300,000)	P	2009	2	2			58
Fieldfare	GB/UK	B	1-2	P	2006-10	3	2			42
<i>Turdus pilaris</i>	GB	W	680,000	I	1981-84	8	3			3, 45
	UK	W	720,000	I	1981-84	8	3			3, 45
Song Thrush	GB	B	1,100,000	T	2009	1-UK	2			32
<i>Turdus philomelos</i> *	UK	B	1,200,000	T	2009	1-UK	2			32
Redwing	GB/UK	B	4-16	P	2006-10	3	3			42
<i>Turdus iliacus</i>	GB	W	650,000	I	1981-84	8	3			3, 45
	UK	W	690,000	I	1981-84	8	3			3, 45
Mistle Thrush	GB	B	160,000	T	2009	1-UK	2			32
<i>Turdus viscivorus</i>	UK	B	170,000	T	2009	1-UK	2			32
Spotted Flycatcher	GB	B	33,000	T	2009	1-UK	3		63	32
<i>Muscicapa striata</i>	UK	B	36,000	T	2009	1-UK	3		63	32
Robin	GB	B	6,000,000	T	2009	1-UK	2			32
<i>Erithacus rubecula</i>	UK	B	6,700,000	T	2009	1-UK	2			32
Common Nightingale	GB/UK	B	6,700 (5,600-9,400)	M	1999	5	3		64	82
<i>Luscinia megarhynchos</i>										
Pied Flycatcher	GB/UK	B	17,000-20,000	P	2009	1-BBS	3		65	32
<i>Ficedula hypoleuca</i>										
Black Redstart	GB/UK	B	19-44	P	2006-10	3	2			42
<i>Phoenicurus ochruros</i>	GB/UK	W	400	I	1981-84	8	3	+	66	45
Common Redstart	GB/UK	B	100,000 (70,000-130,000)	P	2009	2	2			58
<i>Phoenicurus phoenicurus</i>										

Population estimates of birds in Great Britain and the United Kingdom

Species	Region	Season	Estimate	Unit	Date	Der	Rel	+/-	Note	Ref
Whinchat <i>Saxicola rubetra</i>	GB/UK	B	47,000 (19,000–75,000)	P	2009	2	2			58
European Stonechat <i>Saxicola rubicola</i>	GB	B	56,000 (36,000–76,000)	P	2009	2	2			58
	UK	B	59,000 (39,000–79,000)	P	2009	2	2			58
Northern Wheatear <i>Oenanthe oenanthe</i>	GB	B	230,000 (160,000–300,000)	P	2009	2	2			58
	UK	B	240,000 (170,000–310,000)	P	2009	2	2			58
Dunnock <i>Prunella modularis</i> *	GB	B	2,300,000	T	2009	1–UK	2			32
	UK	B	2,500,000	T	2009	1–UK	2			32
House Sparrow <i>Passer domesticus</i>	GB	B	5,100,000 (4,700,000–5,600,000)	P	2009	2	2			58
	UK	B	5,300,000 (4,800,000–5,800,000)	P	2009	2	2			58
Tree Sparrow <i>Passer montanus</i>	GB	B	180,000	T	2009	1–BBS	2			32
	UK	B	200,000	T	2009	1–BBS	2			32
Yellow Wagtail <i>Motacilla flava</i> *	GB/UK	B	15,000	T	2009	1–UK	2			32
Grey Wagtail <i>Motacilla cinerea</i>	GB	B	35,000	P	2009	1–WBS/WBBS	3		67	32
	UK	B	38,000	P	2009	1–WBS/WBBS	3		67	32
Pied Wagtail <i>Motacilla alba</i> *	GB	B	460,000 (400,000–510,000)	P	2009	2	2			58
	UK	B	470,000 (410,000–520,000)	P	2009	2	2			58
Tree Pipit <i>Anthus trivialis</i>	GB/UK	B	88,000 (55,000–121,000)	P	2009	2	2			58
Meadow Pipit <i>Anthus pratensis</i>	GB	B	1,900,000 (1,600,000–2,100,000)	P	2009	2	2			58
	UK	B	2,000,000 (1,800,000–2,300,000)	P	2009	2	2			58
Water Pipit <i>Anthus spinoletta</i>	GB/UK	W	190	I	2006/07–10/11	7	2			88
Rock Pipit <i>Anthus petrosus</i>	GB	B	34,000	P	1988–91	1	3			32
	UK	B	36,000	P	1988–91	1	3			32
Common Chaffinch <i>Fringilla coelebs</i>	GB	B	5,800,000	T	2009	1–UK	2			32
	UK	B	6,200,000	T	2009	1–UK	2			32
Brambling <i>Fringilla montifringilla</i>	GB/UK	W	45,000– 1,800,000	I	1981–84	8	3		68	45
Greenfinch <i>Chloris chloris</i>	GB/UK	B	1,700,000 (1,600,000–1,800,000)	P	2009	2	2			58
European Serin <i>Serinus serinus</i>	GB/UK	B	0–1	P	2006–10	3	1			42
Goldfinch <i>Carduelis carduelis</i>	GB/UK	B	1,200,000 (1,100,000–1,300,000)	P	2009	2	2			58
Siskin <i>Carduelis spinus</i>	GB	B	410,000	P	2009	1–BBS	3			32
	UK	B	420,000	P	2009	1–BBS	3			32
Linnet <i>Carduelis cannabina</i>	GB	B	410,000	T	2009	1–Eng	2			32
	UK	B	430,000	T	2009	1–Eng	2			32
Twite <i>Carduelis flavirostris</i>	GB/UK	B	10,000 (6,000–15,000)	P	1999	5	2			46, 50
Lesser Redpoll <i>Carduelis cabaret</i>	GB	B	190,000	P	2009	1–BBS	3			32
	UK	B	220,000	P	2009	1–BBS	3			32
Common Redpoll <i>Carduelis flammea</i>	GB/UK	B	1–4	P	2006–10	3	2			42
	GB	W	300	I	2006/07–10/11	7	3		69	88
	UK	W	310	I	2006/07–10/11	7	3		69	88
Arctic Redpoll <i>Carduelis hornemanni</i>	GB/UK	W	13	I	2006/07–10/11	7	3		69	88

Species	Region	Season	Estimate	Unit	Date	Der	Rel	+/-	Note	Ref
Common Crossbill <i>Loxia curvirostra</i>	GB	B	39,000 (29,000–51,000)	P	2009	2	2			58
	UK	B	40,000 (31,000–53,000)	P	2009	2	2			58
Scottish Crossbill <i>Loxia scotica</i>	GB/UK	B	6,800 (4,100–11,400)	P	2008	5	2			74
Parrot Crossbill <i>Loxia pytyopsittacus</i>	GB/UK	B	65	P	2008	5	2			74
Bullfinch <i>Pyrrhula pyrrhula</i>	GB	B	190,000	T	2009	1–UK	2			32
	UK	B	220,000	T	2009	1–UK	2			32
Hawfinch <i>Coccothraustes coccothraustes</i>	GB/UK	B	500–1,000	P	2011	5	2			14
Snow Bunting <i>Plectrophenax nivalis</i>	GB/UK	B	60	P	2007	5	3			28
	GB	W	9,000–13,500	I	1981–84	8	3			45, 71
	UK	W	10,000–15,000	I	1981–84	8	3			45, 71
Lapland Bunting <i>Calcarius lapponicus</i>	GB/UK	W	710	I	2006/07–10/11	7	3			88
Yellowhammer <i>Emberiza citrinella</i>	GB	B	700,000	T	2009	1–UK	2			32
	UK	B	710,000	T	2009	1–UK	2			32
Cirl Bunting <i>Emberiza cirlus</i>	GB/UK	B	860 (790–980)	T	2009	5	1			70
Reed Bunting <i>Emberiza schoeniclus</i>	GB	B	230,000	T	2009	1–UK	2			32
	UK	B	250,000	T	2009	1–UK	2			32
Corn Bunting <i>Emberiza calandra</i>	GB/UK	B	11,000 (9,000–13,000)	T	2006–10	5–UK	2			21

Notes

1. Apparent substantial decline in subsequent winters.
2. Probably under-recorded as a breeding species.
3. Although non-breeding numbers are divided by three, it seems likely that there are many non-breeding birds in the population and so the true number of pairs is likely to be lower.
4. Underestimate due to original being based on summed tetrad counts from the 1988–91 *Breeding Atlas*.
5. Winter estimate divided by three to give breeding estimate.
6. Major range expansion since estimate published.
7. Removed from RBBP list after 2009, at which point figures known to be underestimates.
8. Follows approach adopted by *APEP 2* but noted that likely to be an underestimate since original source CBC dataset did not adequately cover higher densities in wetland and urban habitats.
9. Probably under-recorded as a breeding species.
10. Breeding estimates of pairs derived from unrounded winter estimates (minus assumed Dutch breeding birds wintering between Essex and Lincolnshire) adjusted by factor of 2.21 as described in the 1988–91 *Breeding Atlas*.
11. Significant recent declines.
12. Significant recent declines.
13. Considered likely to be minimum estimates as these are extrapolation of tetrad counts during the 1988–91 *Breeding Atlas*.
14. Probably underestimated, given a known range expansion coupled with an estimated 64% increase in density across the core range between 1987 and 1997 (Armitage *et al.* 1997).
15. Calling males from RBBP data and from *Bedfordshire Bird Reports*.
16. This figure is a best estimate given information from RBBP non-native birds reports, selected county bird reports, atlases and avifaunas, and draft information from *Bird Atlas 2007–11*. Populations in Sussex and Scotland seem to have largely disappeared.
17. Recent aerial surveys have revealed larger numbers in northern offshore areas, but there is no collated estimate available.
18. Most birds noted on spring passage off northwest Scotland and figures do not allow for turnover. More potentially occur in offshore waters.
19. Combination of *carbo* and *sinensis*; not straightforward to separate estimates.
20. Continuing increase.
21. Increasingly under-reported as population increases.
22. Estimate does not include unknown numbers dispersed in wider countryside.
23. First confirmed breeding in 2012, with two pairs in Somerset.
24. Mean figure provided but subsequent increase.
25. The 1988–91 *Breeding Atlas* estimate was a minimum and related to individuals – divided by two to give approximate pairs.

26. Mean based on expert opinion, but much under-reported and numbers known to be continuing to rise.
27. Mean figures presented but numbers known to be increasing.
28. Reported figures known to involve a degree of under-reporting.
29. Under-reporting considered likely.
30. Not all pairs are reported to RBBP, so figure represents expert opinion.
31. Figures submitted to RBBP are known to under-represent actual breeding population size.
32. Early information from a repeat survey in 2012 suggests far lower numbers than in 1999.
33. The 1988–91 *Breeding Atlas* estimate was a minimum and related to individuals, as unclear what proportion were non-breeders. However, WeBS suggests that most wintering birds have departed before April, hence estimate now divided by two to give approximate number of pairs.
34. Released birds first laid eggs in 2007 and first hatched young in 2009.
35. Unpublished data show continuing increase in 2011.
36. Lekking males not considered a good measure of the breeding population. Breeding confirmed only in 2006.
37. Estimate derived as sum of referenced estimates from Scotland (8,000–10,000 pairs), England (600 pairs) and Wales (17+ pairs).
38. No new national survey but resurvey of Caithness & Sutherland in 2009 (Bellamy & Eaton 2010) suggests that the overall population has increased.
39. No new census but numbers known to have declined.
40. Number of pairs derived by multiplying *Seabird 2000* estimate of individuals by recommended factor of 0.5.
41. Number of pairs derived by multiplying *Seabird 2000* estimate of individuals by recommended factor of 0.67.
42. No new census but numbers known to have increased.
43. Forrester *et al.* (2007) estimated 1,000–5,000 pairs of wild Rock Doves on the Hebrides, but delineation increasingly difficult.
44. Estimate based on roost total for January 2012 minus that for April 2012, assuming all females are then on nests.
45. This method assumes that males and females are equally detectable, which is clearly not true, so this is an underestimate.
46. Evidence from multiple sources (BBS, *Bird Atlas 2007–11*, RBBP, nestbox schemes) indicate that the breeding population has increased substantially in recent years. However, there is no simple measure of change for this species.
47. The 2005 BTO survey found 1.42 pairs per occupied tetrad, and found that 63% of tetrads were occupied. Applying these figures to the land area of Britain, excluding Shetland, Orkney and the Outer Hebrides where the species is absent, yields an estimate of about 50,000 breeding pairs. The inherent assumptions are that the survey method enabled detection (or inference) of all pairs in the tetrad, and that pairs detected by observers at the mid-point of a tetrad have a territory that does not extend beyond the tetrad boundary. Both assumptions are arguable but reasonable and the estimate should thus be relatively sound.
48. Estimate from the 1968–72 *Breeding Atlas* scaled by the ratio of 10-km squares with breeding evidence between then and *Bird Atlas 2007–11*. This estimate is of extremely uncertain reliability.
49. Estimate from the 1988–91 *Breeding Atlas* scaled by the ratio of 10-km squares with breeding evidence between then and *Bird Atlas 2007–11*.
50. Approach considered to underestimate breeding numbers of this species.
51. Initial estimate based on very approximate figure of 3–5 pairs per 10-km square, hence estimate considered of uncertain reliability.
52. Initial estimate based on uncertain source data. RBBP data also suggest a total in the order of 1,000 pairs.
53. Original estimate was derived from tetrad counts from the 1988–91 *Breeding Atlas* so this is probably an underestimate. Subsequent range expansion not apparent in BBS trend, although latter has wide confidence limits.
54. RBBP considers that species is under-reported.
55. RBBP enquiries to county bird recorders suggest total may be closer to 1,500 pairs, but *Bird Atlas 2007–11* suggests this species is still reasonably widespread between central England and southwest Scotland.
56. Uncertain reliability as extrapolation using BBS trend leads to a substantially higher estimate than using WBS/WBBS trend.
57. RBBP considers that this species is under-reported.
58. Considering records between December and March only.
59. Estimate highly uncertain as there is no way of assessing change between survey in 1984–85 and start of BBS in 1994.
60. Original estimate highly approximate.
61. Many individuals are likely to go unrecorded.
62. Large degree of variation between years.
63. Particularly difficult to decide between conflicting estimates for this species. Using method of Newson *et al.* (2008) leads to estimate of c.130,000 pairs.
64. The BBS suggests a 42% decline in Nightingales between 1999 and 2009, and this is consistent with a major range contraction suggested by *Bird Atlas 2007–11*. However, new research into nocturnal vs diurnal singing behaviour suggests that the 1999 figure was an underestimate. It is not clear whether current numbers are higher or lower than the 1999 figure so that estimate is repeated, and given a low reliability score. A new survey (in 2012) will, once analysed, shed further light on the true population size.
65. Uncertain reliability as original estimate is based on expert opinion of pairs per 10-km square.
66. The 1981–84 *Winter Atlas* suggests 500 in Britain & Ireland, with about 20% of these occurring in the Republic of Ireland. Draft results from *Bird Atlas 2007–11* suggest that this figure is an underestimate.
67. Original estimate based on expert opinion of number of pairs per square.
68. Estimate highly uncertain and numbers vary greatly between winters.
69. Estimate uncertain; numbers are variable between years and identification problems remain.

Appendix 2. Population estimates of selected subspecies or biogeographical populations of birds in Great Britain and the United Kingdom.

Key: See Appendix 1.

Subspecies/population	Region	Season	Estimate	Unit	Date	Der	Rel	+/-	Note	Ref
Taiga Bean Goose <i>Anser fabalis fabalis</i>	GB/UK	W	410	I	2005/06–2009/10	6	1			57
Tundra Bean Goose <i>Anser fabalis rossicus</i>	GB/UK	W	320	I	2004/05–2008/09	6	1			57
European White-fronted Goose <i>Anser albifrons albifrons</i>	GB/UK	W	2,400	I	2004/05–2008/09	6	1			57
Greenland White-fronted Goose <i>Anser albifrons flavirostris</i>	GB/UK	W	13,000	I	2005/06–2009/10	6	1			57
Greylag Goose <i>Anser anser</i>	GB/UK	B	46,000	P	2004–08	5	3			57
(Britain, Ireland)	GB/UK	W	140,000	I	2004/05–08/09	6	2			57
Greylag Goose <i>Anser anser</i> (Iceland)	GB	W	85,000	I	2005/06–09/10	6	2			53
	UK	W	88,000	I	2005/06–09/10	6	2			53
Barnacle Goose <i>Branta leucopsis</i> (E Greenland)	GB/UK	W	58,000	I	2007/08	6	1			54
Barnacle Goose <i>Branta leucopsis</i> (Svalbard)	GB/UK	W	33,000	I	2009/10	6	1			37, 57
Barnacle Goose <i>Branta leucopsis</i>	GB	B	900	P	2004–08	5	3	-	1	57
(naturalised)	UK	B	1,000	P	2004–08	5	3	-	1	57
	GB	W	2,700	I	2004/05–08/09	6	2			57
	UK	W	3,000	I	2004/05–08/09	6	2			57
Dark-bellied Brent Goose <i>Branta bernicla bernicla</i>	GB/UK	W	91,000	I	2004/05–08/09	6	1			57
Light-bellied Brent Goose <i>Branta bernicla hrota</i>	GB	W	710	I	2004/05–08/09	6	1			57
(Canada)	UK	W	27,000	I	2004/05–08/09	6	1			57
Light-bellied Brent Goose <i>Branta bernicla hrota</i>	GB/UK	W	3,400	I	2004/05–08/09	6	1			57
(Svalbard/N Greenland)										
Common Eider <i>Somateria mollissima</i>	GB	B	23,000	P	2004–08	5	2		2	32, 57
(excl. Shetland)	UK	B	25,000	P	2004–08	5	2		2	32, 57
	GB	W	55,000	I	2004/05–08/09	6	2		2	57
	UK	W	58,000	I	2004/05–08/09	6	2		2	57
Common Eider <i>Somateria mollissima</i>	GB/UK	B	2,500	P	2005–09	5	2	-	2	32, 57
(Shetland)	GB/UK	W	5,500	I	2005/06–09/10	6	1	-	2	57
Eurasian Black-tailed Godwit <i>Limosa limosa limosa</i>	GB/UK	B	54–57	P	2006–10	3	1			42
Icelandic Black-tailed Godwit <i>Limosa limosa islandica</i>	GB/UK	B	7–9	P	2006–10	3	1			42
	GB	W	43,000	I	2004/05–08/09	6	1			57
	UK	W	44,000	I	2004/05–08/09	6	1			57
Eurasian Jay <i>Garrulus glandarius hibernicus</i>	UK (NI)	B	4,300	T	2009	1–UK	2			32
Coal Tit <i>Periparus ater britannicus</i>	GB	B	680,000	T	2009	1–UK	2			32
	UK	B	680,000	T	2009	1–UK	2	+	3	32
Coal Tit <i>Periparus ater hibernicus</i>	UK (NI)	B	85,000	T	2009	1–UK	2	-	3	32
Wren <i>Troglodytes troglodytes indigenus</i>	GB	B	7,700,000	T	2009	1–UK	2			32
	UK	B	8,600,000	T	2009	1–UK	2			32
'Fair Isle' Wren <i>Troglodytes troglodytes fridariensis</i>	GB/UK	B	29	T	2007–11	5	1			2

Subspecies/population	Region	Season	Estimate	Unit	Date	Der	Rel	+/-	Note	Ref
'Hebridean' Wren <i>Troglodytes troglodytes hebridensis</i>	GB/UK	B	5,000–10,000	T	2007	5	2			28
'St Kilda' Wren <i>Troglodytes troglodytes hirtensis</i>	GB/UK	B	140	T	1993	5	2	+	4	52
'Shetland' Wren <i>Troglodytes troglodytes zetlandicus</i>	GB/UK	B	1,500–3,000	T	2007	5	2			28
'Shetland' Common Starling <i>Sturnus vulgaris zetlandicus</i>	GB/UK	B	10,000–20,000	P	2007	5	2			28
Dipper <i>Cinclus cinclus gularis</i>	GB/UK	B	5,700–17,100	P	2009	1–WBS/ WBBS	2	-	5	32
Dipper <i>Cinclus cinclus hibernicus</i>	GB/UK	B	510–1,540	P	2009	1–WBS/ WBBS	2	+	6	32
'Hebridean' Song Thrush <i>Turdus philomelos hebridensis</i>	GB/UK	B	500–2,200	P	2003	5	3			49
Dunnock <i>Prunella modularis</i> <i>hebridium</i>	GB	B	75,000–125,000	T	2007	5	3		7	28
	UK	B	240,000–290,000	T	2009	1–UK/5	2		8	28
Yellow Wagtail <i>Motacilla flava flavissima</i>	GB/UK	B	15,000	T	2009	1–UK	2			32
Blue-headed Wagtail <i>Motacilla flava flava</i>	GB/UK	B	0–1	P	2006–10	3	1			42
Pied Wagtail <i>Motacilla alba yarrellii</i>	GB	B	460,000	P	2009	2	2			58
			(400,000–510,000)							
	UK	B	470,000	P	2009	2	2			58
			(410,000–520,000)							
White Wagtail <i>Motacilla alba alba</i>	GB/UK	B	1	P	2006–10	3	1			42

Notes

1. Although we have divided non-breeding numbers by three, it seems likely that there are many non-breeding birds in the population and so the true number of pairs is likely to be lower.

2. Furness *et al.* (2010) suggested that Shetland Eiders appear to be *M. s. faeroeensis* (not currently recognised as occurring in Britain by BOU). Breeding estimates of pairs derived from unrounded winter estimates (minus assumed Dutch breeding birds wintering between Essex and Lincolnshire), adjusted by factor of 2.21 as described in the 1988–91 *Breeding Atlas*.

3. Subspecies *britannicus* mostly found in GB but also occurs in extreme northeast of Ireland where it intergrades into *hibernicus*; precise nature of zone of intergradation unknown.

4. Known underestimate, as Dun and Stac an Armin were not counted.

5. This is an overestimate as some Scottish birds are assigned to *hibernicus*.

6. Estimate is for Northern Ireland but is an underestimate as *hibernicus* also occurs in Hebrides and parts of west coast of mainland Scotland.

7. Subspecies *hebridium* occurs across Ireland but also in Hebrides.

8. Derived from difference between unrounded GB and UK estimates, plus Hebrides estimates from Forrester *et al.* (2007).



Roger Riddington

67. Common Eiders *Somateria mollissima*, Shetland, June 2009.

Appendix 3. Unconfirmed potential breeding species in Great Britain and the United Kingdom during 2006–10, together with historical confirmed breeding species.

Species	Last confirmed breeding by pure pair	Status in 2006–10
Green-winged Teal <i>Anas carolinensis</i>		Summering males, unpaired or displaying to Eurasian Teals.
Black Duck <i>Anas rubripes</i>		Birds in 2007 and 2008 associating with Mallards.
Blue-winged Teal <i>Anas discors</i>		Female paired with Shoveler in 2010.
Ring-necked Duck <i>Aythya collaris</i>		Summering males, unpaired or paired with Tufted Ducks.
Ferruginous Duck <i>Aythya nyroca</i>		Summering birds plus observed juveniles but no completely proven breeding.
Greater Scaup <i>Aythya marila</i>	1999	Summering birds but no proven breeding.
Velvet Scoter <i>Melanitta fusca</i>		Male accompanying female Eider in 2010.
Great Northern Diver <i>Gavia immer</i>		Male paired with Black-throated Diver to 2008.
Black-browed Albatross <i>Thalassarche melanophris</i>		Single bird at Sula Sgeir 2006 and 2007.
Macaronesian Shearwater <i>Puffinus baroli</i>		Single calling male in Devon in 2010.
Red-necked Grebe <i>Podiceps grisegena</i>	2001	Small numbers of summering birds.
Black Kite <i>Milvus migrans</i>		One paired with Red Kite in Scotland in 2006.
Little Crake <i>Porzana parva</i>		Long-staying males in 2007 (Shetland) and 2008 (Devon).
Baillon's Crake <i>Porzana pusilla</i>	mid nineteenth century?	Several calling males in 2012, breeding may have occurred but not confirmed.
Killdeer <i>Charadrius vociferus</i>		Female paired with Ringed Plover in 2007.
Kentish Plover <i>Charadrius alexandrinus</i>	1979	No breeding-season records reported by RBBP.
Temminck's Stint <i>Calidris temminckii</i>	1993	Presence at breeding site in 2006 and 2007 but no evidence.
Buff-breasted Sandpiper <i>Calidris subruficollis</i>		Singing male for three days in 2008.
Pectoral Sandpiper <i>Calidris melanotos</i>		Perhaps bred in 2004, no suggestion of breeding since.
Spotted Sandpiper <i>Actitis macularius</i>	1975	No suggestion of breeding.
Long-tailed Skua <i>Stercorarius longicaudus</i>	1980	One adult held territory in Shetland in 2010.
Great Auk <i>Pinguinus impennis</i>	c. 1812	Globally extinct.
Black Tern <i>Chlidonias niger</i>	1975	No suggestion of breeding.
Ring-billed Gull <i>Larus delawarensis</i>		One mixed pair with Common Gull in 2009.
Eurasian Scops Owl <i>Otus scops</i>		Singing male in Oxfordshire in 2006 and 2007.
Snowy Owl <i>Bubo scandiacus</i>	1975	Numerous records in N and W Scotland in recent years, but no evidence of breeding.
Pallid Swift <i>Apus pallidus</i>		One present for extended period in 2009.
European Bee-eater <i>Merops apiaster</i>	2005	One pair dug nest in 2006 but not known if eggs laid.
Hoopoe <i>Upupa epops</i>	1996	Singing and lingering birds in 2007 but no evidence of breeding.
Wryneck <i>Jynx torquilla</i>	2002	Birds in suitable habitat in most subsequent years.
Penduline Tit <i>Remiz pendulinus</i>		Singing male in 2010.
Shore Lark <i>Eremophila alpestris</i>	2003	No suggestion of breeding.
Iberian Chiffchaff <i>Phylloscopus ibericus</i>		Males singing for extended periods in 2006 (two), 2007, 2009 and 2010 (four).
Marmora's Warbler <i>Sylvia sarda</i>		Singing male in 2010.
Subalpine Warbler <i>Sylvia cantillans</i>		Territorial male in 2009, and pair nest-building in 2010 but no confirmed egg-laying.
River Warbler <i>Locustella fluviatilis</i>		Single singing males in 2008, 2009 and 2010.
Melodious Warbler <i>Hippolais polyglotta</i>		Single singing males in 2008 and 2010.
Great Reed Warbler <i>Acrocephalus arundinaceus</i>		One or two males singing for extended periods each year.
Waxwing <i>Bombycilla garrulus</i>		Pair in potential breeding habitat in 2009.
Bluthroat <i>Luscinia svecica</i>	1996	One singing male in 2010.
Brambling <i>Fringilla montifringilla</i>	2001	Singing males or pairs each year but no evidence of breeding.
Common Rosefinch <i>Carpodacus erythrinus</i>	1997	Singing males or pairs most years but no evidence of breeding.
Lapland Bunting <i>Calcarius lapponicus</i>	1980	No suggestion of breeding.