Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man

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Recent survey data have resulted in the Dotterel *Charadrius morinellus* being one of five upland breeding species that moved from Amber to Red in *BoCC4*.

Abstract This is the fourth review of the status of birds in the UK, Channel Islands and Isle of Man. Using standardised criteria, 244 species were assessed and assigned to the Red, Amber or Green list of conservation concern. The assessment criteria include conservation status at global and European levels and, within the UK, historical decline, trends in population and range, rarity, localised distribution and international importance. The findings are alarming, with 20 species moving on to the Red list and only three leaving it. Three formerly regular breeding species are considered to have ceased breeding in the UK (Temminck's Stint *Calidris temminckii*, Wryneck *Jynx torquilla* and European Serin *Serinus serinus*).

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Some 67 (27.5%) of the UK's regularly occurring bird species are now on the Red list. As well as reinforcing existing conservation concerns, such as for birds of woodland and lowland farmland and for long-distance migrants, this assessment should heighten concern for other groups. Five upland species, including Eurasian Curlew *Numenius arquata* and Dotterel *Charadrius morinellus*, have moved to the Red list. Declines in the UK's internationally important breeding seabird populations are emphasised here by the Red-listing of Shag *Phalacrocorax aristotelis*, Kittiwake *Rissa tridactyla* and Puffin *Fratercula arctica*. Yet the effect of well-targeted conservation action is demonstrated by the recovery of Eurasian Bittern *Botaurus stellaris* and European Nightjar *Caprimulgus europaeus*, with both moving from Red to Amber.

Introduction

This paper presents the fourth 'Birds of Conservation Concern' (*BoCC*) assessment for birds in the UK. Using a well-established approach, based on quantitative assessments against standardised criteria, birds are placed on 'Red', 'Amber' or 'Green' lists to indicate the level of conservation concern we have for them. By using a transparent and standardised approach, based upon the best available data, and conducted by a multi-partner group drawn from relevant organisations in both statutory and non-governmental sectors, this is a robust assessment of the status of all the bird species considered an established part of the UK's avifauna. These lists report on the fortunes of individual species but also indicate broader changes in the UK's biodiversity.

In the last assessment (*BoCC3*, Eaton *et al.* 2009), we stated that 'current pressures on the global environment are unprecedented, with widespread and severe threats to habitats and the species within them', and that funds for conservation action 'are limited, and often the first to be lost in times of economic downturn'. Since then, the pressures on nature on a global scale have increased (Hoekstra & Wiedmann 2014), and the UK has suffered a lengthy and severe economic recession. And, as expected, funding for nature conservation has fallen: public sector spending on biodiversity in the UK has decreased substantially from a recent peak in 2008/09, both in real terms and as a proportion of GDP (Defra 2014). As a consequence of a continuing decline in nature (e.g. Burns *et al.* 2013, Defra 2014), increasing pressures, and decreased resources to tackle these pressures, the need for effective use of those resources has never been greater. The first step to ensure effective use of resources is to prioritise, and exercises such as *BoCC* are essential in this regard, helping us to identify the species (and through further analysis, the countries and regions, habitats, and conservation issues) that most urgently require remedial action.

The red-listing of birds in the UK stretches back over a quarter of a century, with the first formal assessment being that of Batten *et al.* (1990), who listed 117 species in their *Red Data Book*. 'Birds of Conservation Concern' first appeared later that decade, with Gibbons *et al.* (1996b) publishing the first 'traffic light system' of Red, Amber and Green lists. The two subsequent reviews, *BoCC2* (Gregory *et al.* 2002) and *BoCC3* (Eaton *et al.* 2009), have sought to employ the same approach, although there have been some changes in methodology to reflect growing experience and changes in data availability. Key headlines identified during these *BoCC* assessments were:

- *BoCC1* (1996): 36 species were placed on the first *BoCC* Red list, which was instrumental in raising the profile of the severe declines in widespread farmland birds such as Skylark *Alauda arvensis* and Corn Bunting *Emberiza calandra,* part of probably the greatest loss of UK biodiversity in the twentieth century (Aebischer *et al.* 2000).
- *BoCC2* (2002): the Red list rose to 40 species, with the addition of a number of woodland birds such as Lesser Spotted Woodpecker *Dendrocopos minor* and Willow Tit *Poecile montana* illustrating the

bird declines in this habitat (Fuller *et al.* 2005). The continuing recovery of raptors such as Red Kite *Milvus milvus*, Osprey *Pandion haliaetus* and Marsh Harrier *Circus aeruginosus* from historical persecution saw them move from Red to Amber.

- *BoCC3* (2009): a more substantial growth in the Red list saw it expanded to 52 species. The additions to the Red list included more woodland species, such as Hawfinch *Coccothraustes coccothraustes* and Wood Warbler *Phylloscopus sibilatrix*, but for the first time the plight of Afro-Palearctic migrants, such as Common Cuckoo *Cuculus canorus*, rose to the fore, with particular concern for species that winter in the humid tropics (e.g. Vickery *et al.* 2014). Climate change may have contributed to such declines, as it may also have done in the decline of six newly Red-listed northern species (e.g. Whimbrel *Numenius phaeopus* and Redwing *Turdus iliacus*), for which the UK lies at the southern or western edge of the breeding range. Some comfort could be gained from the fact that targeted conservation action for Stone-curlew *Burhinus oedicnemus* and Woodlark *Lullula arborea* resulted in those two species moving from Red to Amber. Notably, *BoCC3* conducted the first subspecies-level *BoCC* assessment, enabling different levels of concern to be applied to different races of the same species (such as Black-tailed Godwits *Limosa limosa* of the nominate race and *L. l. islandica*), and the threats facing some of the UK's endemic races to be identified.

This latest report comes six years after *BoCC3*. The six-year gap fits into an emerging cycle of reporting on the status of the UK's birds, influenced by the requirements of the EU's Wild Birds Directive (79/409/EEC). This dictates that all EU Member States report on the status (e.g. trends, ranges and populations) of all native bird species at six-year intervals. This was most recently done in 2013. The collation of similar data from across the EU, combined with parallel submissions from BirdLife International partners in non-EU countries, enables Europe-wide reporting (European Commission 2015) and the production of an updated European Red List of Birds (ERLOB; BirdLife International 2015) at regular intervals. Through this schedule, a number of the 'building blocks' of *BoCC* assessments are put in place: updated Global and European Red List assessments, and new population estimates through the work of the Avian Population Estimates Panel (APEP; see Musgrove *et al.* 2013), which help us to assess species against criteria for rarity and international importance (see below), the latter helped by the availability of the European dataset compiled for ERLOB.



Edmund Fellowes/BTO

416. The Grey Wagtail *Motacilla cinerea* is one of five upland species moving from Amber to Red in *BoCC4*, a move that highlights concern about species of our upland streams and rivers.

Methods

The species list

As in previous assessments, we considered all naturally occurring native species on the British List (BOU 2013; see also www.bou.org.uk), but with filters to exclude some species from the full assessment: vagrants, defined as species considered by BBRC (www.bbrc.org.uk), and species occurring only as scarce migrants (e.g. White & Kehoe 2015a,b). As before, we have also included Globally Threatened species (BirdLife International 2015) that have occurred in the UK in each of the last 25 years (Balearic Shearwater *Puffinus mauretanicus* and Aquatic Warbler *Acrocephalus paludicola*), regardless of scarcity in the UK.

A number of non-native species are well established in the UK but, despite the fact that some are appreciated by birdwatchers and the public, we do not consider these species to have conservation value in the UK and they are excluded from this assessment.

As in *BoCC3*, rarer breeding species were considered only if they had been proven (or strongly suspected) to breed for five consecutive years within the most recent 25 years for which data are available. This excluded a number of species, such as European Bee-eater *Merops apiaster*, which remain occasional breeders in the UK, and others that may well be in the process of establishing (e.g. Great White Egret *Ardea alba* and Little Bittern *Ixobrychus minutus*). Species considered to be regular breeders in *BoCC3* were excluded from consideration (and placed on the list of 'former breeders') if they had not bred in any of the five most recent years for which data are available.

Note that some species were excluded from assessment as breeding species, but were assessed because they have larger or better-established non-breeding populations (e.g. Red-necked Grebe *Podiceps grisegena* and Black Tern *Chlidonias niger*).

One species was added to our list: Caspian Gull *Larus cachinnans* was assessed for the first time since its acceptance as a full species in 2007 (BOU 2008). Since the last review it has become apparent that the Caspian Gull is a regular non-breeding visitor to the UK.

The assessment process

BoCC assessments use a set of quantitative criteria that fall into two groups, for the Red and the Amber lists. All species are assessed against all of these criteria, and are placed on the highest priority list for which they qualify. If they meet none of these criteria, they are placed on the Green list.

The criteria used for *BoCC4* were largely those used for *BoCC3*, which in turn had evolved from previous *BoCC* assessments. The clear advantage to maintaining a consistent approach to assessments over time is that it allows a direct comparison of the results of those assessments. A few minor adjustments were necessary, to allow for changing circumstances and data availability, and these are outlined below. All the *BoCC* criteria are summarised briefly, but Eaton *et al.* (2009) contained further details, while a fuller account of the criteria and data used is available in the Supplementary Online Material at www.britishbirds.co.uk/wp-content/uploads/2014/07/SM.pdf The adjustments arose because we felt that the criteria used for assessing recovery (and any lapse in that recovery) from historical decline could be improved; because of changes forced upon us by the availability of information on European status; and because of the availability of new atlas data for assessing non-breeding range change. Our adjustments and the reasoning behind them are discussed below, and the impacts of these changes are analysed in the Results section.

Red-list criteria

IUCN: Global conservation status. Species that are Globally Threatened (Critically Endangered, Endangered and Vulnerable, but not Near Threatened) under IUCN guidelines, as assessed by BirdLife International, the IUCN Red List Authority for birds, in 2015 (www.iucnredlist.org).

HD: Historical decline in breeding populations. Species judged to have declined severely between 1800 and 1995, from an assessment conducted by Gibbons *et al.* (1996a), and which have not recovered subsequently. The process by which species should be deemed to have shown partial recovery from historical decline (hence move



Richard Chandler

417. One of the headline birds of this current *BoCC* review is the Eurasian Curlew *Numenius arquata*, which moved from Amber to Red. A recent paper in *BB* called this species the most important bird conservation priority in the UK (Brown *et al.* 2015).

to the Amber list), or complete recovery (move to the Green list), or subsequently faltered from those recoveries, was a subject of much debate. We agreed that the initial assessments of historical decline by Gibbons *et al.*, based on a semi-quantitative scoring of population changes within five periods, were robust; and that it was still appropriate that any HD species doubling its population size or more within the relevant 25-year period, and exceeding 100 breeding pairs, should move to the Amber list (provided it did not qualify as Red under other criteria). We made one change to this step to be consistent with other criteria, and introduced an assessment of trend over the longer-term period, defined as the entire period used for assessments since the first *BoCC* review, starting in 1969.

A key concern, however, was how to treat changes subsequent to a move to Amber (HDrec), namely how any future recovery or decline should be regarded. The criterion used for *BoCC3* stipulated that a decline of 20% between *BoCC* reviews should dictate that a species returns to the Red list, whereas a further increase of 20% over a similar period would enable a species to move to the Green list (unless it qualified as Amber under any other criteria). We felt that this was a rather unsatisfactory approach, in that in both cases the criterion used a non-standard measurement period unrelated to those used for other *BoCC* criteria, and which could lead to changes in status due to relatively insubstantial and short-term fluctuations in population size.

Therefore, for *BoCC4* we have used the following rationale: a species should be moved to the Green list (if not qualifying against other Red or Amber criteria) if it shows continued and substantial recovery from historical decline beyond the level (HDrec) that qualified the species for the Amber list. When it moves to Green, the species should be considered as having recovered permanently and would no longer be considered against the historical decline criterion, i.e. any subsequent decline would be assessed only against the relevant decline criteria such as BDp (see below). That being the case, we felt that at least another doubling of numbers should be required to permit movement to the Green list. In fact, we now require a species to have shown a further

increase of at least 167% from its HDrec level in order to move to the Green list. This higher threshold ensures that if a species subsequently declines by anything less than 25% (thus does not trigger a return to the Amber list under the moderate decline criterion), it will still remain at more than double its HDrec numbers.

As an example, imagine a hypothetical species that qualified for the *BoCC1* Red list under the historical decline criterion, but no others. This species increased from 100 to 300 pairs within 25 years (well over the doubling to 200 required) and thus was moved from Red to Amber in *BoCC2*. If, by the time of this current review, it had increased to 900 pairs (an increase of 200% from its HDrec level of 300 pairs and thus above the 167% threshold of 801 pairs), it would be moved to the Green list and the HD criterion would no longer apply. If it had failed to increase by this rate, but remained above 200 pairs, it would stay on the Amber list. Finally, if it had declined to below 200 pairs, it would return to the Red list. In the last two cases, the HD criterion would still play a role in future assessments.

BDp: Breeding population decline. Severe decline in the UK breeding population size (>50%) over 25 years (**BDp[1]**) or the longer-term (**BDp[2]**), defined as the entire period used for assessments since the first *BoCC* review, starting in 1969.

WDp: Non-breeding population decline. Severe decline in the UK non-breeding population size (>50%) over 25 years (**WDp[1]**) or the longer-term (**WDp[2]**) as defined above. Non-breeding trends were assessed only if a species has substantially independent breeding and non-breeding populations, otherwise only the breeding population was assessed. The same was true for other criteria which could be applied to both breeding and non-breeding populations.

BDr: Breeding range decline. Severe decline in UK range (>50%) between the breeding bird atlases in 1988–91 and 2007–11 (**BDr[1]**) or 1968–71 and 2007–11 (**BDr[2]**), as measured by the calculated change in the number of occupied 10-km squares.

WDr: Non-breeding range decline. Severe decline in UK range (>50%) between the wintering bird atlases in 1981–84 and 2007–11 (**WDr[1]**), as measured by the calculated change in the number of occupied 10-km squares. Since there are only two wintering bird atlases, it was not possible to measure range change over a longer time period. Note that while *BoCC* reviews have always intended to assess range change in the non-breeding season, this is the first assessment able to do so.

Amber-list criteria

ERLOB: European Red List status. Previous *BoCC* assessments have used Species of European Conservation Concern assessments (SPECs; see Tucker & Heath 1994 and BirdLife International 2004) as an indication of wider regional concern for a species, and thus Amber-listed any UK species that was SPEC-listed. Although a new assessment of species status across Europe, the European Red List of Birds (ERLOB; BirdLife International 2015), was published in 2015, this produced only IUCN Red List assessments of regional extinction risk (IUCN 2012) with no consideration of the wider suite of measures (species rarity, localisation, moderate decline and depletion) included in SPEC assessments. At present, it is not clear when or if new SPECs will be published. Therefore, to complete the *BoCC* assessment, we faced a quandary: to delay publication of *BoCC* in the hope that SPEC assessments would be completed or to drop the use of SPECs as part of *BoCC*. We chose the latter option, and thus have Amber-listed any species on the European Red List (Critically Endangered, Endangered or Vulnerable). We recognise that the exclusion of species that were previously SPEC-listed has had an impact on our final lists, by moving species from Amber to Green – and we investigate the scale of this impact below – but we feel that our decision provides a sound basis for this and future *BoCC* assessments.

HDrec: Historical decline – recovery. As described above, previously Red-listed for historical decline, followed by an increase of at least 100% over 25 years or the longer-term period. This also applies if the move to

HDrec happened in a previous *BoCC* assessment, having remained above the 100% increase threshold, but not having recovered further to move to Green (see text under historical decline above).

BDMp: Breeding population decline. As for Red-list criterion BDp, but with moderate decline (>25% but <50%) over 25 years (**BDMp¹**) or the longer-term period (**BDMp²**).

WDMp: Non-breeding population decline. As for Red-list criterion WDp, but with moderate decline (>25% but <50%) over 25 years (**WDMp¹**) or the longer-term period (**WDMp²**).

BDMr: Breeding range decline. As for Red-list criterion BDr, but with moderate decline (>25% but <50%) between 1988–91 and 2007–11 (**BDMr¹**) or 1968–71 and 2007–11 (**BDMr²**).

WDMr: Non-breeding range decline. As for Red-list criterion WDr, but with moderate decline (>25% but <50%) between 1981–84 and 2007–11 (**WDMr¹**).

BR & WR: Breeding and non-breeding rarity. Species qualified as rare breeders (BR) if the UK breeding population was <300 pairs, and as rare non-breeders (WR) if the UK non-breeding population was <900 individuals.

BL & WL: Breeding and non-breeding localisation. Species were considered localised if more than 50% of the UK population was found at ten or fewer sites in either the breeding (BL) or the non-breeding (WL) season. Sites were defined as either Special Protection Areas (SPAs; Stroud *et al.* 2001) or Important Bird Areas (IBAs; Heath & Evans 2000). Rare breeders or rare non-breeders (see above) were not assessed against this criterion, as their small population sizes predispose them to be restricted to a small number of sites.

BI & WI: Breeding and non-breeding international importance. Species were considered of international importance if the UK holds at least 20% of the European population in either the breeding (BI) or the non-breeding (WI) season. European estimates were derived from data collated as part of the ERLOB assessment, but for non-breeding waterbirds we used estimates for the flyway populations for northwest Europe (wildfowl) or East Atlantic (waders) (Wetlands International 2015).

Data sources

We are fortunate in that, thanks to the efforts of thousands of dedicated volunteer birdwatchers working in tandem with professional research and conservation organisations, birds in the UK are one of the best-monitored taxonomic groups anywhere in the world. We are thus well equipped to make status assessments such as *BoCC*, and for many species can make robust assessments against all the *BoCC* criteria. This is not true for all species, however, and it is highly likely that some data gaps have influenced our assessment. The principal sources of data were as for *BoCC3*, and our treatment of data from these sources was as described in Eaton *et al.* (2009). Further details can be found at www.britishbirds.co.uk/wp-content/uploads/2014/07/SM.pdf

In summary, the main sources for measuring population trends were:

- The *BTO/JNCC Common Birds Census (CBC)* and *BTO/JNCC/RSPB Breeding Bird Survey (BBS)*; when combined, these gave us trends for common and widespread breeding birds from the late 1960s onwards. For some species, such as Common Swift *Apus apus* and Wood Warbler, trends were available only from the start of the BBS in 1994. Details of the BBS and the latest results can be found in Harris *et al.* (2015) and at www.bto.org/volunteer-surveys/bbs
- *BTO/JNCC/RSPB Wetland Bird Survey (WeBS)* and *WWT/JNCC/SNH Goose and Swan Monitoring Programme*, which together provided annual trends for most wildfowl species from 1966/67 onwards and for waders from 1974/75 onwards, with a few other waterbird species monitored over shorter periods. See Holt *et al.* (2015) and www.bto.org/volunteer-surveys/webs and http://monitoring.wwt.org.uk/our-work/goose-swan-monitoring-programme

- Seabird monitoring comes from two sources: the three complete censuses conducted in 1969–70 (Cramp *et al.* 1974), 1985–88 (Lloyd *et al.* 1991) and 1998–2001 (Mitchell *et al.* 2004), and the Seabird Monitoring Programme that has monitored a UK-wide sample of colonies since 1986. See www.jncc.defra.gov.uk/page-1550
- Rare Breeding Birds Panel data provided trends since 1973 for rare breeders (defined, loosely, as species with UK populations of less than 2,000 pairs, although data collation for less rare species began more recently than 1973). We used data up to 2012 (Holling *et al.* 2014) to create long-term and 25-year trends, sometimes in combination with estimates from single-species surveys. See www.rbbp.org.uk
- Periodic species surveys run under the Statutory Conservation Agency and RSPB Annual Breeding Birds Scheme (SCARABBS) programme, BTO species surveys and the GWCT/BTO Woodcock survey provided trends and population figures for a number of scarce and rare species.

With occasional exceptions (see the Supplementary Online Material for details), trends were calculated using data up to and including 2012. In the case of BBS/CBC and BBS trends, these were smoothed trends, using data from 2013 but changes reported up to 2012 following standard statistical practice.

For measuring trends in range we relied on the three breeding bird atlases (Sharrock 1976, Gibbons *et al.* 1993 and Balmer *et al.* 2013) and two wintering bird atlases (Lack 1986 and Balmer *et al.* 2013). Given the 20-year gaps between breeding atlases, some *BoCC* assessments (e.g. *BoCC3*) have been forced to rely on rather out-of-date measures of change in range. The recent *Bird Atlas 2007–11* allowed us to generate up-to-date measures of change in breeding range over both the long-term (between the first and third atlases, a period of 40 years) and a 20-year period (between the second and third atlases, approximating to the 25-year trend period). In addition, we were able for the first time to calculate (near) 25-year trends in non-breeding range, based on the two winter atlases with fieldwork periods covering 1981/82 to 1984/85 and 2007/08 to 2010/11.



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418. Three breeding seabirds moved from Amber to Red in *BoCC4*, with both Shag *Phalacrocorax aristotelis* (illustrated) and Kittiwake *Rissa tridactyla* doing so because of continuing serious declines in the UK breeding populations.

Population estimates were derived from a range of sources and almost all are as reported by APEP (see Musgrove *et al.* 2013). To maintain consistency with the data used for UK reporting under the Wild Birds Directive, we did not update these estimates to account for any additional data available since their publication, except for species for which the results from new national surveys were available (e.g. Dotterel *Charadrius morinellus*; Hayhow *et al.* 2015). Localisation estimates were derived using these UK estimates and data collated in the third review of the UK's network of SPAs (Stroud *et al.* in prep.). There has been no update of the population estimates within IBAs since the *BoCC3* review; since these form an important complementary approach to assessing localisation within SPAs, we simply reused the existing *BoCC3* assessments for IBAs.

Race-level assessments

As with *BoCC3*, we conducted a parallel assessment of the *BoCC* status of regularly occurring races of birds. With the exception of the changes in criteria (HD and ERLOB) described above and applied similarly to races, the process was as described in Eaton *et al.* (2009). As before, the lack of some data sources at a race level (e.g. Global and European IUCN assessments, and monitoring data at the race level) required us to create new estimates of populations, trends and status outside of the UK as best we could with existing data sources.

We note that over the last six years little has changed to clarify further the status of some of the UK's less well-known races. We used as our starting point the same list of races compiled for *BoCC3*, based primarily on the list of races maintained by the BOU but informed by other key references; as before, our inclusion of a race in this review does not constitute a judgement on its validity. There were, however, some relevant taxonomic changes, most arising from investigations at the species level leading to changes in what is considered a valid race. Four races were no longer considered: Pintail *Anas acuta* and Sandwich Tern *Sterna sandvicensis* are now considered monotypic following the split of other races into separate species (Southern Pintail *A. eatoni* and Cabot's Tern *S. acuflavida*, respectively), Red Kite is effectively monotypic following the extinction of the Cape Verde Kite *M. m. fasciicauda* (Johnson *et al.* 2005), and the occurrence of the Marsh Tit race *Poecile p. palustris* in the UK was dismissed by Broughton (2009). We considered three additional races: Greater Scaup *Aythya m. marila*, European Storm-petrel *Hydrobates p. pelagicus* and Slavonian Grebe *Podiceps a. auritus*, as a consequence of these species being recognised as polytypic since our last assessment (del Hoyo & Collar 2014).

Results

BoCC4 species-level assessment

Three species were identified as not having bred in the UK in the last five years for which data were available; they were thus removed from the assessment and are now considered to be 'former breeders': Temminck's Stint *Calidris temminckii*, Wryneck *Jynx torquilla* and European Serin *Serinus serinus* (table 1). The addition of Caspian Gull meant that in total 244 species were assessed. Of these 244 species, *BoCC4* placed 67 (27.5%) on the Red list, 96 (39.3%) on the Amber list, and 81 (33.2%) on the Green list. Lists of species, qualifying criteria and values are given in tables 2–4.

There has been a substantial change in the way species are distributed among the three

Table 1. Formerly regular breeding species in the UK.

	year of last recorded breeding
Great Bustard *Otis tarda*	c. 1833
Kentish Plover *Charadrius alexandrinus*	1979
Temminck's Stint *Calidris temminckii*	1993
Black Tern *Chlidonias niger*	1975
Great Auk *Pinguinus impennis*	c. 1812
Snowy Owl *Bubo scandiacus*	1975
Wryneck *Jynx torquilla*	2002
European Serin *Serinus serinus*	2006

Table 2. Species on the *BoCC4* Red list, the criteria under which they qualify, and values for those criteria. Red[b] and Amber[c] criteria

	BoCC3[a]	IUCN	HD	BDp[1] & BDMp[1]	BDp[2] & BDMp[2]	WDp[1] & WDMp[1]	WDp[2] & WDMp[2]	BDr[1] & BDMr[1]	BDr[2] & BDMr[2]	WDr[1] & WDMr[1]	ERLOB	HDrec	BR	WR	BL	WL	BI	WI
White-fronted Goose *Anser albifrons*	G					-60	-54											
Common Pochard *Aythya ferina*	A	VU				-51	-34	-38	-36		VU							
Greater Scaup *Aythya marila*	R					-49	-83				VU					90–100[IBA]		
Long-tailed Duck *Clangula hyemalis*	G	VU									VU							
Common Scoter *Melanitta nigra*	R			-63	-81			-58	-50				52			90–100[Both]		
Velvet Scoter *Melanitta fusca*	A	VU									VU					90–100[IBA]		
Black Grouse *Tetrao tetrix*	R		*	-80	Severe decline				-28									
Capercaillie *Tetrao urogallus*	R			-42	Severe decline				-72	-55								
Grey Partridge *Perdix perdix*	R			-76	-91				-40									
Balearic Shearwater *Puffinus mauretanicus*	R	CR									CR							
Shag *Phalacrocorax aristotelis*	A			-62	-36												50–60	
Red-necked Grebe *Podiceps grisegena*	A					-72								57				
Slavonian Grebe *Podiceps auritus*	A	VU		-56	-62			-33					30					
White-tailed Eagle *Haliaeetus albicilla*	R		*										37–44					
Hen Harrier *Circus cyaneus*	R		*															
Corn Crake *Crex crex*	R				-52				-74			*						
Northern Lapwing *Vanellus vanellus*	R			-57	-63						VU							
Ringed Plover *Charadrius hiaticula*	A			-37		-52	-42											50–60
Dotterel *Charadrius morinellus*	A			-57											70–80[Both]			
Whimbrel *Numenius phaeopus*	R			-67				-50	-27									
Eurasian Curlew *Numenius arquata*	A			-49	-62						VU						20–30	
Black-tailed Godwit *Limosa limosa*	R		*					-35			VU		61–66			90–100[IBA]		
Ruff *Calidris pugnax*	R			-41	-62			-62					0–11	820				
Red-necked Phalarope *Phalaropus lobatus*	R		*										20–24					
Woodcock *Scolopax rusticola*	A			-29				-31	-52									
Arctic Skua *Stercorarius parasiticus*	R			-79	-44													
Puffin *Fratercula arctica*	A	VU							-27		EN				80–90[Both]			
Roseate Tern *Sterna dougallii*	R			-73	-86			-27	-62				89					

Table 2. Species on the *BoCC4* Red list, the criteria under which they qualify, and values for those criteria. Red[b] and Amber[c] criteria (cont.)

	BoCC3[a]	IUCN	HD	BDp[1] & BDMp[1]	BDp[2] & BDMp[2]	WDp[1] & WDMp[1]	WDp[2] & WDMp[2]	BDr[1] & BDMr[1]	BDr[2] & BDMr[2]	WDr[1] & WDMr[1]	ERLOB	HDrec	BR	WR	BL	WL	BI	WI
Kittiwake *Rissa tridactyla*	A			-74	-62						VU							
Herring Gull *Larus argentatus*	R				-60	-53 to -60												20–30
Turtle Dove *Streptopelia turtur*	R	VU		-92	-96			-35	-51		VU							
Common Cuckoo *Cuculus canorus*	R			-60	-62													
Lesser Spotted Woodpecker *Dendrocopos minor*	R			-81	-81			-29	-37									
Merlin *Falco columbarius*	A		*															
Golden Oriole *Oriolus oriolus*	R			-81	-70			-40					2–5					
Red-backed Shrike *Lanius collurio*	R		*	-66	-93				-88				1–3					
Willow Tit *Poecile montana*	R			-91	-94			-49	-54	-43								
Marsh Tit *Poecile palustris*	R			-43	-72													
Skylark *Alauda arvensis*	R			-32	-62													
Wood Warbler *Phylloscopus sibilatrix*	R			-66				-37	-34									
Grasshopper Warbler *Locustella naevia*	R			-68	-93													
Savi's Warbler *Locustella luscinioides*	R			-74	-66			-30					1–3					
Aquatic Warbler *Acrocephalus paludicola*	R	VU									VU							
Marsh Warbler *Acrocephalus palustris*	R			-77	-88								2–8					
Common Starling *Sturnus vulgaris*	R			-70	-83													
Ring Ouzel *Turdus torquatus*	R			-72					-43									
Fieldfare *Turdus pilaris*	R			-50	-63			-77	-32				1–2					
Song Thrush *Turdus philomelos*	R				-59													
Redwing *Turdus iliacus*	R			-73	-49			-45	-32				4–16					
Mistle Thrush *Turdus viscivorus*	A			-45	-62													
Spotted Flycatcher *Muscicapa striata*	R			-80	-88													
Common Nightingale *Luscinia megarhynchos*	A			-60	-85				-43									
Pied Flycatcher *Ficedula hypoleuca*	A			-53				-27										
Black Redstart *Phoenicurus ochruros*	A			-52	-33								19–44	400				
Whinchat *Saxicola rubetra*	A			-55				-38	-48									

Table 2. Species on the *BoCC4* Red list, the criteria under which they qualify, and values for those criteria. Red[b] and Amber[c] criteria (cont.)

	BoCC3[a]	IUCN	HD	BDp[1] & BDMp[1]	BDp[2] & BDMp[2]	WDp[1] & WDMp[1]	WDp[2] & WDMp[2]	BDr[1] & BDMr[1]	BDr[2] & BDMr[2]	WDr[1] & WDMr[1]	ERLOB	HDrec	BR	WR	BL	WL	BI	WI
House Sparrow *Passer domesticus*	R			-32	-66													
Tree Sparrow *Passer montanus*	R				-90				-37									
Yellow Wagtail *Motacilla flava*	R			-63	-70			-25	-32									
Grey Wagtail *Motacilla cinerea*	A			-33	-57													
Tree Pipit *Anthus trivialis*	R			-64	-70				-29									
Hawfinch *Coccothraustes coccothraustes*	R			-74				-64	-75									
Linnet *Linaria cannabina*	R				-60													
Twite *Linaria flavirostris*	R		*	-52														
Lesser Redpoll *Acanthis cabaret*	R			-64	-83												30–40	
Yellowhammer *Emberiza citrinella*	R			-49	-54													
Cirl Bunting *Emberiza cirlus*	R								-85									
Corn Bunting *Emberiza calandra*	R		*	-61	-90			-35	-56	-27								

[a] *BoCC3* assessments: R = Red, A = Amber, G = Green

[b] Red-list criteria:

IUCN: Globally Threatened (CR = Critically Endangered, EN = Endangered, VU = Vulnerable). HD: historical decline in the breeding population. BDp[1/2]: severe breeding population decline over 25 years/longer term. WDp[1/2]: severe non-breeding population decline over 25 years/longer term. BDr[1/2]: severe breeding range decline over 25 years/longer term. WDr[1]: severe non-breeding range decline over 25 years.

[c] Amber-list criteria:

ERLOB: Threatened in Europe (CR = Critically Endangered, EN = Endangered, VU = Vulnerable). HDrec: historical decline – recovery. BDMp[1/2]: moderate breeding population decline over 25 years/longer term. WDMp[1/2]: moderate non-breeding population decline over 25 years/longer term. BDMr[1/2]: moderate breeding range decline over 25 years/longer term. WDMr[1]: moderate non-breeding range decline over 25 years. BR/WR: breeding/non-breeding rarity. BL/WL: breeding/non-breeding localisation. Superscript text indicates whether species qualified as localised in IBAs, SPAs, or both. BI/WI: breeding/non-breeding international importance. Figures are given in bands for species exceeding the qualifying thresholds for the localisation and international importance criteria.

Red and Amber criteria for population and range trends are given as % change, and are combined in the same columns (e.g. BDp[1] and BDMp[1]): red and amber colour-coding is used to show which a species qualified against.

When a species has changed list since *BoCC3*, shading of table cells is used to indicate the criteria responsible for that change.

Table 3. Species on the *BoCC4* Amber list, the criteria under which they qualify, and values for those criteria. Amber criteria[b]

	BoCC3[a]	ERLOB	HDrec	BDMp[1]	BDMp[2]	WDMp[1]	WDMp[2]	BDMr[1]	BDMr[2]	WDMr[1]	BR	WR	BL	WL	BI	WI
Mute Swan *Cygnus olor*	G															20–30
Bewick's Swan *Cygnus columbianus*	A	EN				-45								90–100[Both]		30–40
Whooper Swan *Cygnus cygnus*	A										9–14			90–100[IBA]		
Bean Goose *Anser fabalis*	A											730				
Pink-footed Goose *Anser brachyrhynchus*	A													90–100[Both]		70–80
Greylag Goose *Anser anser*	A													50–60[IBA]		
Barnacle Goose *Branta leucopsis*	A													70–80[Both]		
Brent Goose *Branta bernicla*	A													70–80[Both]		40–50
Common Shelduck *Tadorna tadorna*	A			-41										50–60[IBA]	20–30	20–30
Eurasian Wigeon *Anas penelope*	A													50–60[IBA]		30–40
Gadwall *Anas strepera*	A															20–30
Eurasian Teal *Anas crecca*	A															40–50
Mallard *Anas platyrhynchos*	A					-38										
Pintail *Anas acuta*	A					-34		-27	-27		9–33			90–100[IBA]		40–50
Garganey *Anas querquedula*	A										14–93					
Shoveler *Anas clypeata*	A															30–40
Common Eider *Somateria mollissima*	A	VU														
Common Goldeneye *Bucephala clangula*	A										200					
Smew *Mergellus albellus*	A											180				
Common Quail *Coturnix coturnix*	A		*													
Red Grouse *Lagopus lagopus*	A	VU														
Black-throated Diver *Gavia arctica*	A										220	560				
Great Northern Diver *Gavia immer*	A	VU														50–60
Fulmar *Fulmarus glacialis*	A	EN											50–60[IBA]			
Manx Shearwater *Puffinus puffinus*	A								-28				90–100[Both]		80–90	
European Storm-petrel *Hydrobates pelagicus*	A												90–100[Both]			
Leach's Storm-petrel *Oceanodroma leucorhoa*	A												90–100[Both]			
Northern Gannet *Morus bassanus*	A												90–100[Both]		30–40	

Table 3. Species on the *BoCC4* Amber list, the criteria under which they qualify, and values for those criteria. Amber criteria[b] (cont.)

	BoCC3[a]	ERLOB	HD rec	BDMp[1]	BDMp[2]	WDMp[1]	WDMp[2]	BDMr[1]	BDMr[2]	WDMr[1]	BR	WR	BL	WL	BI	WI
Eurasian Bittern *Botaurus stellaris*	R		*								80	600				
Eurasian Spoonbill *Platalea leucorodia*	A										2	20				
Black-necked Grebe *Podiceps nigricollis*	A										32–51	130				
Honey-buzzard *Pernis apivorus*	A										33–69					
Marsh Harrier *Circus aeruginosus*	A		*										50–60[SPA]			
Montagu's Harrier *Circus pygargus*	A								-28		12–16					
Osprey *Pandion haliaetus*	A		*								200–250					
Spotted Crake *Porzana porzana*	A										27					
Common Crane *Grus grus*	A										9–14	52				
Stone-curlew *Burhinus oedicnemus*	A								-42				70–80[Both]			
Avocet *Recurvirostra avosetta*	A												90–100[Both]	90–100[Both]		
Oystercatcher *Haematopus ostralegus*	A	VU												50–60[Both]	30–40	30–40
Grey Plover *Pluvialis squatarola*	A													60–70[Both]		20–30
Bar-tailed Godwit *Limosa lapponica*	A													80–90[Both]		30–40
Turnstone *Arenaria interpres*	A					-41										20–30
Red Knot *Calidris canutus*	A													90–100[Both]		40–50
Curlew Sandpiper *Calidris ferruginea*	G	VU														
Sanderling *Calidris alba*	G													60–70[SPA]		
Dunlin *Calidris alpina*	R						-49	-27					70–80[Both]/50–60[SPA]			
Purple Sandpiper *Calidris maritima*	A			-43		-49		-33			1					
Common Sandpiper *Actitis hypoleucos*	A			-45	-40											
Green Sandpiper *Tringa ochropus*	A										1–3					
Spotted Redshank *Tringa erythropus*	A											98				
Greenshank *Tringa nebularia*	G												70–80[SPA]			
Wood Sandpiper *Tringa glareola*	A										11–27	<900				
Common Redshank *Tringa totanus*	A			-44		-32		-35	-43							20–30
Common Snipe *Gallinago gallinago*	A								-31							
Great Skua *Stercorarius skua*	A												70–80[SPA]		50–60	

Table 3. Species on the *BoCC4* Amber list, the criteria under which they qualify, and values for those criteria. Amber criteria[b] (cont.)

	BoCC3[a]	ERLOB	HDrec	BDMp[1]	BDMp[2]	WDMp[1]	WDMp[2]	BDMr[1]	BDMr[2]	WDMr[1]	BR	WR	BL	WL	BI	WI
Black Guillemot *Cepphus grylle*	A							-29								
Razorbill *Alca torda*	A												70–80[Both]		20–30	
Common Guillemot *Uria aalge*	A												50–60[IBA]		50–60	
Little Tern *Sternula albifrons*	A								-30				60–70[Both]			
Sandwich Tern *Sterna sandvicensis*	A			-25									90–100[Both]			
Common Tern *Sterna hirundo*	A												60–70[IBA]			
Arctic Tern *Sterna paradisaea*	A			-38				-29								
Black-headed Gull *Chroicocephalus ridibundus*	A					-33 to -41										60–70
Mediterranean Gull *Larus melanocephalus*	A												50–60[IBA]			
Common Gull *Larus canus*	A															40–50
Caspian Gull *Larus cachinnans*	NA											90				
Lesser Black-backed Gull *Larus fuscus*	A												70–80[IBA]		20–30	
Glaucous Gull *Larus hyperboreus*	A											170				
Iceland Gull *Larus glaucoides*	A											240				
Yellow-legged Gull *Larus michahellis*	A										1					
Great Black-backed Gull *Larus marinus*	A				-29	-33 to -58										
Stock Dove *Columba oenas*	A														20–30	
Tawny Owl *Strix aluco*	G			-31	-30											
Short-eared Owl *Asio flammeus*	A							-38	-47							
European Nightjar *Caprimulgus europaeus*	R								-45							
Common Swift *Apus apus*	A			-38												
Common Kingfisher *Alcedo atthis*	A	VU														
Common Kestrel *Falco tinnunculus*	A			-33	-46											
Shore Lark *Eremophila alpestris*	A											74				
House Martin *Delichon urbicum*	A			-33	-49											
Willow Warbler *Phylloscopus trochilus*	A			-32	-38											
Dartford Warbler *Sylvia undata*	A		*										50–60[SPA]			
Short-toed Treecreeper *Certhia brachydactyla*	A										<300					

Table 3. Species on the *BoCC4* Amber list, the criteria under which they qualify, and values for those criteria. Amber criteria[b] (cont.)

	BoCC3[a]	ERLOB	HDrec	BDMp[1]	BDMp[2]	WDMp[1]	WDMp[2]	BDMr[1]	BDMr[2]	WDMr[1]	BR	WR	BL	WL	BI	WI
Dipper *Cinclus cinclus*	G			-27												
Common Redstart *Phoenicurus phoenicurus*	A								-31							
Dunnock *Prunella modularis*	A				-31											
Meadow Pipit *Anthus pratensis*	A				-44											
Water Pipit *Anthus spinoletta*	A											190				
Bullfinch *Pyrrhula pyrrhula*	A				-39											
Common Redpoll *Acanthis flammea*	G											310				
Scottish Crossbill *Loxia scotica*	A														100	
Parrot Crossbill *Loxia pytyopsittacus*	A										65					
Snow Bunting *Plectrophenax nivalis*	A										100					
Lapland Bunting *Calcarius lapponicus*	A											710				
Reed Bunting *Emberiza schoeniclus*	A				-38											

[a] *BoCC3* assessments:

NA = Not assessed, R = Red, A = Amber, G = Green

[b] Amber-list criteria:

ERLOB: Threatened in Europe (CR = Critically Endangered, EN = Endangered, VU = Vulnerable). HDrec: historical decline – recovery. BDMp[1/2]: moderate breeding population decline over 25 years/longer term. WDMp[1/2]: moderate non-breeding population decline over 25 years/longer term. BDMr[1/2]: moderate breeding range decline over 25 years/longer term. WDMr[1]: moderate non-breeding range decline over 25 years. BR/WR: breeding/non-breeding rarity. BL/WL: breeding/non-breeding localisation. Superscript text indicates whether species qualified as localised in IBAs, SPAs, or both. BI/WI: breeding/non-breeding international importance. Figures are given in bands for species exceeding the qualifying thresholds for the localisation and international importance criteria.

When a species has changed list since *BoCC3*, shading of table cells is used to indicate the criterion/criteria responsible for that change.

Eurasian Bittern moved from Red to Amber since it no longer qualifies under historical decline.

Table 4. Species Green-listed by *BoCC4*.

Name	*BoCC3*[a]	Name	*BoCC3*[a]
Tufted Duck *Aythya fuligula*	A[1]	Jackdaw *Corvus monedula*	G
Red-breasted Merganser *Mergus serrator*	G	Rook *Corvus frugilegus*	G
Goosander *Mergus merganser*	G	Carrion Crow *Corvus corone*	G
Ptarmigan *Lagopus muta*	G	Hooded Crow *Corvus cornix*	G
Red-throated Diver *Gavia stellata*	A[1]	Common Raven *Corvus corax*	G
Great Shearwater *Puffinus gravis*	G	Goldcrest *Regulus regulus*	G
Sooty Shearwater *Puffinus griseus*	A[1]	Firecrest *Regulus ignicapilla*	A[6]
Great Cormorant *Phalacrocorax carbo*	G	Blue Tit *Cyanistes caeruleus*	G
Little Egret *Egretta garzetta*	A[2]	Great Tit *Parus major*	G
Grey Heron *Ardea cinerea*	G	Crested Tit *Lophophanes cristatus*	A[1]
Little Grebe *Tachybaptus ruficollis*	A[3,4]	Coal Tit *Periparus ater*	G
Great Crested Grebe *Podiceps cristatus*	G	Bearded Tit *Panurus biarmicus*	A[7,2]
Red Kite *Milvus milvus*	A[1]	Woodlark *Lullula arborea*	A[1,8,2]
Northern Goshawk *Accipiter gentilis*	G	Sand Martin *Riparia riparia*	A[1]
Eurasian Sparrowhawk *Accipiter nisus*	G	Barn Swallow *Hirundo rustica*	A[1]
Common Buzzard *Buteo buteo*	G	Cetti's Warbler *Cettia cetti*	G
Golden Eagle *Aquila chrysaetos*	A[1]	Long-tailed Tit *Aegithalos caudatus*	G
Water Rail *Rallus aquaticus*	G	Common Chiffchaff *Phylloscopus collybita*	G
Moorhen *Gallinula chloropus*	G	Blackcap *Sylvia atricapilla*	G
Common Coot *Fulica atra*	G	Garden Warbler *Sylvia borin*	G
European Golden Plover *Pluvialis apricaria*	A[5]	Lesser Whitethroat *Sylvia curruca*	G
Little Ringed Plover *Charadrius dubius*	G	Common Whitethroat *Sylvia communis*	A[4]
Little Stint *Calidris minuta*	G	Sedge Warbler *Acrocephalus schoenobaenus*	G
Jack Snipe *Lymnocryptes minimus*	A[1]	Reed Warbler *Acrocephalus scirpaceus*	G
Pomarine Skua *Stercorarius pomarinus*	G	Waxwing *Bombycilla garrulus*	G
Long-tailed Skua *Stercorarius longicaudus*	G	Eurasian Nuthatch *Sitta europaea*	G
Little Auk *Alle alle*	G	Eurasian Treecreeper *Certhia familiaris*	G
Black Tern *Chlidonias niger*	A[1]	Wren *Troglodytes troglodytes*	G
Little Gull *Hydrocoloeus minutus*	A[1]	Blackbird *Turdus merula*	G
Rock Dove *Columba livia*	G	Robin *Erithacus rubecula*	G
Wood Pigeon *Columba palumbus*	G	European Stonechat *Saxicola rubicola*	G
Collared Dove *Streptopelia decaocto*	G	Northern Wheatear *Oenanthe oenanthe*	A[1]
Barn Owl *Tyto alba*	A[1]	Pied Wagtail *Motacilla alba*	G
Long-eared Owl *Asio otus*	G	Rock Pipit *Anthus petrosus*	G
Green Woodpecker *Picus viridis*	A[1]	Brambling *Fringilla montifringilla*	G
Great Spotted Woodpecker *Dendrocopos major*	G	Common Chaffinch *Fringilla coelebs*	G
Hobby *Falco subbuteo*	G	Greenfinch *Chloris chloris*	G
Peregrine Falcon *Falco peregrinus*	G	Common Crossbill *Loxia curvirostra*	G
Red-billed Chough *Pyrrhocorax pyrrhocorax*	A[1]	Goldfinch *Carduelis carduelis*	G
Magpie *Pica pica*	G	Siskin *Spinus spinus*	G
Eurasian Jay *Garrulus glandarius*	G		

[a] *BoCC3* assessments:
R = Red, A = Amber, G = Green. For species which have changed list since *BoCC3* (all of which have moved from the Amber list), the superscript text indicates which criteria they no longer qualify for Amber under. [1] = ERLOB (previously SPEC), [2] = breeding localisation, [3] = moderate breeding population decline over 25 years, [4] = moderate breeding population decline over longer term, [5] = non-breeding international importance, [6] = breeding rarity, [7] = moderate breeding range decline over 25 years, [8] = moderate breeding range decline over longer term.

Table 5. Number of species moving between Red, Amber and Green lists since *BoCC3*.

		BoCC4 status				
		Red	Amber	Green	Not assessed	Total
BoCC3 status	Red	47	3	0	2	52
	Amber	18	85	22	1	126
	Green	2	7	59	0	68
	Not assessed	0	1	0	–	1
	Total	67	96	81	3	247[1]

[1] Number of species assessed across *BoCC3* and *BoCC4* combined; *BoCC3* assessed 246 species, *BoCC4* 244 species.

lists since *BoCC3*, with 52 species (21% of those reassessed) changing *BoCC* status (table 5). The Red list has increased by 15, owing to 19 species being Red-listed for the first time, one species (Merlin *Falco columbarius*) returning to the Red list, and five species leaving the Red list either by moving to Amber (three species) or the list of former breeders (two). Of the species Red-listed for the first time, two moved directly from the Green list: White-fronted Goose *Anser albifrons* on account of the non-breeding population decline and Long-tailed Duck *Clangula hyemalis* as a consequence of being classified as Globally Threatened.

After a long decline from the nineteenth century onwards, the Wryneck last bred in the UK in 2002 and should now be considered a former breeder. Of the species to have been lost from the UK in modern times, this is probably the first that can be described as once having been common and widespread; it was recorded breeding in 54 counties between 1875 and 1900 (Holloway 1996). The other two species to have ceased breeding, Temminck's Stint and European Serin, have only ever been known as extremely rare or occasional breeders here.

The other notable change is the decrease in the relative length of the Amber list, which held 126 species in *BoCC3* but 96 in *BoCC4*:



Edmund Fellowes/BTO

419. The Merlin *Falco columbarius* returns to the Red list after being Amber-listed in *BoCC2* and *BoCC3*, as its recovery from historical decline has faltered.



Roger Riddington

420. Once a widespread breeding bird in the UK, the Wryneck *Jynx torquilla* is now classed as a former breeder, the last confirmed breeding record being in 2002. British birdwatchers can now expect to see it only as a spring and autumn passage migrant.

22 species moved from Amber to Green and 18 to Red, although seven were gained from the Green list and three from the Red. The net increase in the length of the Green list, by 14 species, is ostensibly good news and in some instances due to genuine improvements in the status of species, but see below for a discussion of the influence of changes in the assessment process, which has resulted in an estimated nine species moving to the Green list. The only new species assessed by *BoCC4*, Caspian Gull, went onto the Amber list. Table 5 summarises the movements between the three lists since *BoCC3*. Of the 243 species assessed by both *BoCC3* and *BoCC4*, 26 (10.7%) moved to a higher level of conservation concern and another 25 (10.3%) moved to a lower level of concern; the remaining 192 species (79.0%) did not change status between the two assessments.

An analysis of the reasons why species were Red-listed (which Red-list criteria they met) revealed that breeding population decline was by far the most important criterion; 50 species (74.6% of the Red list) qualified owing to declines over 25 years (12 species), the longer term (14) or both time periods (24). Fig. 1 shows how many species were listed against each criterion, and reveals that a significant number (21 species, over the two time periods) qualified for the Red list under no other criteria. Only six species qualified under non-breeding population decline, over either time period.

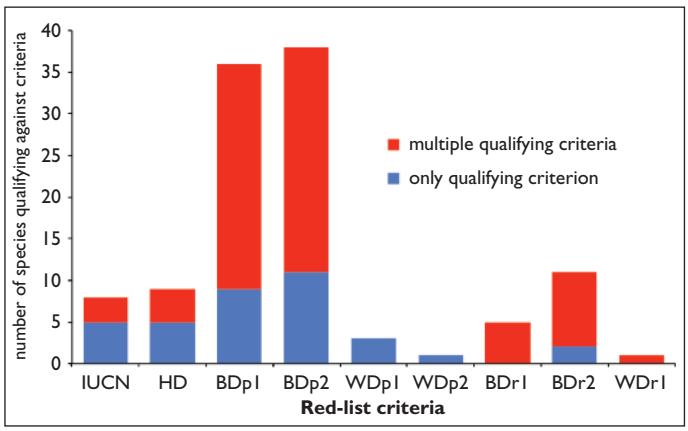


Fig. 1. Criteria under which species qualified for the *BoCC4* Red list. Bars show the number of species qualifying against each Red-list criterion: blue sections indicate the number of species which qualified against no other Red-list criteria, i.e. this criterion was the sole reason for the Red-listing.

The availability of new atlas data (Balmer *et al.* 2013) meant that the

range-change criterion increased in importance in this review. Whereas *BoCC3* listed only five species against severe range decline (all over the longer-term period), *BoCC4* found that 14 species showed a severe decline in range over at least one of the time periods and, notably, two species (Woodcock *Scolopax rusticola* and Cirl Bunting *Emberiza cirlus*) were Red-listed owing to range decline alone.

Finally, a concerning trend is the increasing number of the UK's species which are considered Globally Threatened. Whereas previous *BoCC* assessments have listed only two species, Balearic Shearwater and Aquatic Warbler, because of global threat, *BoCC4* lists an additional six: Common Pochard *Aythya ferina*, Long-tailed Duck, Velvet Scoter *Melanitta fusca*, Slavonian Grebe, Puffin *Fratercula arctica* and Turtle Dove *Streptopelia turtur*. Five of these eight Globally Threatened species did not qualify for Red-listing under any other criteria (Pochard, Slavonian Grebe and Turtle Dove being the exceptions).

The impact of changes in the assessment process

Although the *BoCC4* review has seen a substantial change in the composition of Red, Amber and Green lists, as described previously there were some changes in the way the review was conducted. We have explored the likely impact of these changes on our results, to be confident that the trends in list lengths are not an artefact of these changes.

We can clearly identify how our changes in treatment of recovery from historical decline (criteria HD and HDrec) influence the *BoCC4* outcome (table 6): if we had applied the approach used in *BoCC3,* then Merlin would have remained Amber-listed, under the HDrec criterion, rather than returning to Red as HD. Marsh Harrier and Osprey were considered to have shown complete recovery from historical decline by *BoCC3* but under *BoCC4* they are no longer considered to have recovered sufficiently to meet our new threshold. The change in assessment process is not responsible for a change in their *BoCC* status, however, as both species are also Amber-listed under additional criteria. The changes have no effect on the listing of other HD species.

The availability of wintering range data from *Bird Atlas 2007–11* meant that we were able to assess non-breeding range change (WDr[1]) across all relevant species for the first time. Very few species showed substantial non-breeding range declines; only one, Capercaillie *Tetrao urogallus,* declined by more than 50%, and no species were Red- or



Roger Riddington

421. Several results from the current review show the impact of a changing climate, and the movement of Ringed Plover *Charadrius hiaticula* from Amber to Red is one example, reflecting the decreasing number of winter visitors as birds are no longer pushed across to the UK by cold weather on the Continent



Ben Andrew/RSPB-images

422. Largely as a result of targeted conservation effort, to create and maintain reedbeds in suitable condition, the Eurasian Bittern *Botaurus stellaris* moved from Red to Amber in the current review, another step on its continued recovery as a breeding species in the UK.

Amber-listed on this criterion alone.

The change in how status at the European level was incorporated (moving from the SPEC to the ERLOB criterion) has had more of an impact on our lists, although it affects only potential listing on the Amber and Green lists. Some 65 species that qualified under the SPEC criterion in *BoCC3* did not qualify under ERLOB in the new assessment (only 20 UK species were listed as threatened by ERLOB), and as a consequence, 15 of these moved to the Green list (the remaining 50 being retained as Red or Amber through other criteria). Without having new SPEC assessments for comparison, it is difficult to be certain how many of those 15 species would have been retained on the Amber list if new SPECs had been available. Additional analyses conducted on data from EU member states (BirdLife International 2015) suggest that, at that scale, six species (e.g. Tufted Duck *Aythya fuligula* and Green Woodpecker *Picus viridis*) had recovered from the measures of population decline and/or depletion that resulted in them being SPEC-listed previously, and would not have been SPEC-listed if such assessments had been made. It is less clear for the remaining nine species, but it seems likely that most if not all of these would have been retained as SPEC – for example, Golden Eagle *Aquila chrysaetos* would have still qualified as Rare within Europe (see BirdLife International 2004). It is also possible that new assessment would have led to the SPEC-listing of some species for the first time, and potentially the movement of these species from the Green list to Amber.

In conclusion, the changes in *BoCC4* criteria resulted in one additional species on the Red list, and approximately nine additional species on the Green list, compared with the same criteria used for *BoCC3* (table 6).

Table 6. The likely impact of the changes of assessment criteria (for historical decline and European status) on *BoCC4* results.

Change in process	Effect (*BoCC3* list → *BoCC4* list)	Species affected
Changes in recovery from HD	Amber → Red	Merlin
Using ERLOB instead of SPEC status	Amber → Green	Sooty Shearwater, Golden Eagle, Jack Snipe, Black Tern, Little Gull, Red-billed Chough, Sand Martin, Barn Swallow, Northern Wheatear

Data gaps

We lacked population trends for 21 breeding species, including seabird species for which the UK is internationally important (e.g. Manx Shearwater *Puffinus puffinus*), upland species (e.g. Dunlin *Calidris alpina*), the endemic Scottish Crossbill *Loxia scotica* and a disparate collection of other species with distributions, habitat preferences and behaviours which mean that they elude the attentions of standard monitoring programmes (e.g. Eurasian Wigeon *Anas penelope*, Long-eared Owl *Asio otus* and Rock Pipit *Anthus petrosus*). These are important gaps, not least because, as shown in fig. 1, the criteria for breeding population decline tend to be by far the most influential in determining listing status. It is worth noting that another of this group, the Short-eared Owl *Asio flammeus*, showed a long-term decline in range of 47%; had population monitoring been undertaken for the same period it is distinctly possible that it may have qualified for the Red list. Noting that longer-term breeding trends were lacking for a much larger number of birds (54 species), however, does indicate that recent decades have seen a welcome improvement in our monitoring coverage.

Race-level assessment

BoCC4 assessments were made for 224 races (of 173 species) occurring regularly in the UK. Of these, 57 races (25.4%) were Red-listed, 94 (42.0%) Amber-listed, and 73 (32.6%) Green-listed; these proportions are similar to those for the species-level assessment. Lists of races on the three lists and the criteria under which they qualify are given in tables 7–9.

Eighteen races have moved onto the Red list since *BoCC3*: 16 from Amber, and two newly assessed races (Slavonian Grebe and Greater Scaup). Many of the moves to the Red list mirror changes in parent species, for example because of UK population declines which apply to the race as well as to the species, such as for Shag *Phalacrocorax a. aristotelis* and Pied Flycatcher *Ficedula h. hypoleuca*. However, three of the new Red-listed races are not Red-listed at species level (in all, 44 races have a different *BoCC4* listing from their parent species) including, most notably, the British race of Greenfinch *Chloris chloris harrisoni* – as a species, Greenfinch is Green-listed but the race would qualify as Globally Threatened due to recent decline, driven by outbreaks of the parasitic disease trichomonosis (Lawson *et al.* 2012).



Andy Hay/RSPB-images

423. The European Nightjar *Caprimulgus europaeus* moves from Red to Amber in *BoCC4*, joining other largely heathland and grassland species, such as Stone-curlew *Burhinus oedicnemus* and Woodlark *Lullula arborea*, which made the same move in the *BoCC3* review.



Ben Hall/RSPB-images

424. Common Pochard *Aythya ferina* has moved from Amber to Red as a consequence of population decline – not just in the UK, where it has shown a severe drop in non-breeding numbers, but also more widely. This international decline has resulted in it being listed as Vulnerable on the IUCN Global Red list.



Stanley Porter/RSPB-images

425. The Woodcock *Scolopax rusticola* moves from Amber to Red in *BoCC4* as a consequence of a shrinking breeding range in the UK. It is one of just two species (Cirl Bunting *Emberiza cirlus* being the other) that are Red-listed owing to range decline alone.

Table 7. Races on the *BoCC4* Red list and the criteria under which they qualify. Red[b] and Amber[c] criteria

Species[d] / Race	*BoCC4* species[a]	IUCN	HD	BD_{p1} & BDM_{p1}	BD_{p}^{2} & BDM_{p2}	WD_{p1} & WDM_{p1}	WD_{p}^{2} & WDM_{p2}	BD_{r1} & BDM_{r1}	BD_{r}^{2} & BDM_{r2}	WD_{r1} & WDM_{r1}	ERLOB	HD_{rec}	BR	WR	BL	WL	BI	WI
'Taiga Bean Goose' *Anser f. fabalis*	A	⋆									⋆			⋆				
'Greenland White-fronted Goose' *Anser albifrons flavirostris*	R	⋆									⋆							⋆
'European White-fronted Goose' *Anser a. albifrons*	R						⋆									⋆		
*Greater Scaup *Aythya m. marila*	R	⋆				⋆	⋆				⋆					⋆		
Common Eider *Somateria m. mollissima*	A	⋆									⋆							
Black Grouse *Tetrao tetrix britannicus*	R	⋆	⋆	⋆	⋆				⋆		⋆						⋆	
Capercaillie *Tetrao u. urogallus*	R			⋆	⋆				⋆	⋆								
Grey Partridge *Perdix p. perdix*	R			⋆	⋆				⋆						⋆			
*Fulmar *Fulmarus g. glacialis*	A	⋆									⋆							
*Shag *Phalacrocorax a. aristotelis*	R			⋆	⋆												⋆	
*Red-necked Grebe *Podiceps g. grisegena*	R					⋆								⋆				
*Slavonian Grebe *Podiceps a. auritus*	R			⋆	⋆			⋆					⋆					
Hen Harrier *Circus c. cyaneus*	R		⋆															
*Ringed Plover *Charadrius h. hiaticula*	R			⋆		⋆	⋆										⋆	
Whimbrel *Numenius p. phaeopus*	R			⋆		⋆		⋆	⋆									
*Eurasian Curlew *Numenius a. arquata*	R			⋆	⋆						⋆						⋆	
Black-tailed Godwit *Limosa l. limosa*	R	⋆	⋆					⋆			⋆		⋆					
Roseate Tern *Sterna d. dougallii*	R			⋆	⋆			⋆	⋆				⋆					
*Kittiwake *Rissa t. tridactyla*	R			⋆	⋆						⋆							
Herring Gull *Larus argentatus argenteus*	R	⋆		⋆	⋆						⋆						⋆	
Turtle Dove *Streptopelia t. turtur*	R	⋆		⋆	⋆			⋆	⋆		⋆							
Common Cuckoo *Cuculus c. canorus*	R			⋆	⋆													
*Common Kingfisher *Alcedo atthis ispida*	A	⋆			⋆						⋆							
Lesser Spotted Woodpecker *Dendrocopos minor comminutus*	R	⋆		⋆	⋆			⋆	⋆		⋆						⋆	
*Merlin *Falco columbarius aesalon*	R		⋆															

Table 7. Races on the *BoCC4* Red list and the criteria under which they qualify. Red[b] and Amber[c] criteria (cont.)

Species[d] / Race	*BoCC4* species[a]	IUCN	HD	BDp[1] & BDMp[1]	BDp[2] & BDMp[2]	WDp[1] & WDMp[1]	WDp[2] & WDMp[2]	BDr[1] & BDMr[1]	BDr[2] & BDMr[2]	WDr[1] & WDMr[1]	ERLOB	HDrec	BR	WR	BL	WL	BI	WI
Golden Oriole *Oriolus o. oriolus*	R			*	*			*					*					
Red-backed Shrike *Lanius c. collurio*	R		*	*	*				*				*					
Willow Tit *Poecile montana kleinschmidti*	R	*		*	*			*	*	*	*						*	
Marsh Tit *Poecile palustris dresseri*	R			*	*												*	
Skylark *Alauda a. arvensis*	R			*	*													
Grasshopper Warbler *Locustella n. naevia*	R			*	*													
Savi's Warbler *Locustella l. luscinioides*	R			*	*			*					*					
'Fair Isle Wren' *Troglodytes troglodytes fridariensis*	G	*									*		*				*	
'St Kilda Wren' *Troglodytes t. hirtensis*	G	*									*		*				*	
Common Starling *Sturnus v. vulgaris*	R			*	*													
Ring Ouzel *Turdus t. torquatus*	R			*					*									
'Hebridean Song Thrush' *Turdus philomelos hebridensis*	R	*									*						*	
Song Thrush *Turdus p. clarkei*	R				*												*	
Redwing *Turdis i. iliacus*	R			*	*			*	*				*					
*Mistle Thrush *Turdus v. viscivorus*	R			*	*													
Spotted Flycatcher *Muscicapa s. striata*	R			*	*													
Common Nightingale *Luscinia m. megarhynchos*	R			*	*				*									
*Pied Flycatcher *Ficedula h. hypoleuca*	R			*				*										
*Black Redstart *Phoenicurus ochruros gibraltariensis*	R			*	*								*	*				
House Sparrow *Passer d. domesticus*	R			*	*													
Tree Sparrow *Passer m. montanus*	R				*				*									
Yellow Wagtail *Motacilla flava flavissima*	R	*		*	*			*	*		*						*	
*Grey Wagtail *Motacilla c. cinerea*	R			*	*													
Tree Pipit *Anthus t. trivialis*	R			*	*				*									

Table 7. Races on the *BoCC4* Red list and the criteria under which they qualify. Red[b] and Amber[c] criteria (cont.)

Species[d] / Race	*BoCC4* species[a]	IUCN	HD	BDp[1] & BDMp[1]	BDp[2] & BDMp[2]	WDp[1] & WDMp[1]	WDp[2] & WDMp[2]	BDr[1] & BDMr[1]	BDr[2] & BDMr[2]	WDr[1] & WDMr[1]	ERLOB	HDrec	BR	WR	BL	WL	BI	WI
Hawfinch *Coccothraustes c. coccothraustes*	R			*				*	*									
*Greenfinch *Chloris chloris harrisoni*	G	*									*						*	
Linnet *Linaria c. cannabina*	R				*													
Twite *Linaria flavirostris bensonorum*	R	*		*													*	
Twite *Linaria f. pipilans*	R		*	*													*	
Yellowhammer *Emberiza c. citrinella*	R			*	*													
Corn Bunting *Emberiza calandra clanceyi*	R	*	*	*	*						*		*				*	
Corn Bunting *Emberiza c. calandra*	R		*	*	*			*	*	*								

[a] *BoCC4* assessments for 'parent' species: R = Red, A = Amber, G = Green

[b] Red-list criteria:

IUCN: Globally Threatened. HD: historical decline in the breeding population. BDp[1/2]: severe breeding population decline over 25 years/longer term. WDp[1/2]: severe non-breeding population decline over 25 years/longer term. BDr[1/2]: severe breeding range decline over 25 years/longer term. WDr[1]: severe non-breeding range decline over 25 years.

[c] Amber-list criteria:

ERLOB: Threatened in Europe. HDrec: historical decline – recovery. BDMp[1/2]: moderate breeding population decline over 25 years/longer term. WDMp[1/2]: moderate non-breeding population decline over 25 years/longer term. BDMr[1/2]: moderate breeding range decline over 25 years/longer term. WDMr[1]: moderate non-breeding range decline over 25 years. BR/WR: breeding/non-breeding rarity. BL/WL: breeding/non-breeding localisation. BI/WI: breeding/non-breeding international importance.

Red and Amber criteria for population and range trends are combined in the same columns (e.g. BDp[1] and BDMp[1]): red and amber colour-coding is used to show which a species qualified against.

[d] Asterisks indicate species with a changed race-level status since *BoCC3*.

This table lists Red-listed races of polytypic species only: it does not include monotypic species, e.g. Long-tailed Duck.

Table 8. Races on the *BoCC4* Amber list and the criteria under which they qualify.

Species[c] / Race	*BoCC4* species[a]	ERLOB	HDrec	BDMp[1]	BDMp[2]	WDMp[1]	WDMp[2]	BDMr[1]	WDMr[1]	BDMr[2]	BR	WR	BL	WL	BI	WI
Bewick's Swan *Cygnus columbianus bewickii*	A	★				★								★		★
'Tundra Bean Goose' *Anser fabalis rossicus*	A											★				
Greylag Goose *Anser a. anser*	A													★		★
*'Dark-bellied Brent Goose' *Branta b. bernicla*	A													★		★
'Pale-bellied Brent Goose' *Branta b. hrota*	A													★		★
Eurasian Teal *Anas c. crecca*	A															★
Mallard *Anas p. platyrhynchos*	A					★										
Common Eider *Somateria mollissima faeroeensis*	A			★	★										★	
Common Goldeneye *Bucephala c. clangula*	A										★					
Common Quail *Coturnix c. coturnix*	A		★													
Red Grouse *Lagopus lagopus scotica*	A														★	
Ptarmigan *Lagopus muta millaisi*	G														★	
Black-throated Diver *Gavia a. arctica*	A										★	★				
European Storm-petrel *Hydrobates p. pelagicus*	A												★			
Leach's Storm-petrel *Oceanodroma l. leucorhoa*	A												★		★	
Great Cormorant *Phalacrocorax c. carbo*	G														★	
Great Cormorant *Phalacrocorax carbo sinensis*	G												★			
Eurasian Bittern *Botaurus s. stellaris*	A		★								★	★				
Eurasian Spoonbill *Platalea l. leucorodia*	A										★	★				
Black-necked Grebe *Podiceps n. nigricollis*	A										★	★				
Marsh Harrier *Circus a. aeruginosus*	A		★										★			
Osprey *Pandion h. haliaetus*	A		★								★					
Common Crane *Grus g. grus*	A										★	★				
*Stone-curlew *Burhinus o. oedicnemus*	A									★			★			
Oystercatcher *Haematopus o. ostralegus*	A	★												★	★	★
Black-tailed Godwit *Limosa limosa islandica*	R										★			★		★
Bar-tailed Godwit *Limosa l. lapponica*	A	★												★		★
Turnstone *Arenaria i. interpres*	A					★										★

Table 8. Races on the *BoCC4* Amber list and the criteria under which they qualify. (cont.)

Species[c] / Race	*BoCC4* species[a]	ERLOB	HDrec	BDMp[1]	BDMp[2]	WDMp[1]	WDMp[2]	BDMr[1]	WDMr[1]	BDMr[2]	BR	WR	BL	WL	BI	WI
Red Knot *Calidris canutus islandica*	A													★		★
Dunlin *Calidris a. alpina*	A						★							★		★
*Dunlin *Calidris alpina schinzii*	A							★					★			
Common Redshank *Tringa t. totanus*	A			★		★		★		★						
Common Redshank *Tringa t. robusta*	A					★										★
Common Snipe *Gallinago g. gallinago*	A									★						
Common Snipe *Gallinago g. faeroeensis*	A															★
*Black Guillemot *Cepphus grylle arcticus*	A							★								
Razorbill *Alca torda islandica*	A												★		★	
Common Guillemot *Uria a. aalge*	A												★			
Common Guillemot *Uria a. albionis*	A												★		★	
Little Tern *Sternula a. albifrons*	A									★			★			
Common Tern *Sterna h. hirundo*	A												★			
Common Gull *Larus c. canus*	A															★
Lesser Black-backed Gull *Larus fuscus graellsii*	A														★	
Glaucous Gull *Larus h. hyperboreus*	A											★				
Iceland Gull *Larus g. glaucoides*	A											★				
Yellow-legged Gull *Larus m. michahellis*	A										★					
Stock Dove *Columba o. oenas*	A														★	
*Tawny Owl *Strix aluco sylvatica*	A			★	★			★								
Short-eared Owl *Asio f. flammeus*	A									★						
European Nightjar *Caprimulgus e. europaeus*	A									★						
Common Swift *Apus a. apus*	A			★												
Great Spotted Woodpecker *Dendrocopos major anglicus*	G				★										★	
Common Kestrel *Falco t. tinnunculus*	A			★	★											
Merlin *Falco columbarius subaesalon*	R															★
Red-billed Chough *Pyrrhocorax p. pyrrhocorax*	G														★	
Eurasian Jay *Garrulus glandarius hibernicus*	G														★	

Table 8. Races on the *BoCC4* Amber list and the criteria under which they qualify. (cont.)

Species[c] / Race	*BoCC4* species[a]	ERLOB	HDrec	BDMp[1]	BDMp[2]	WDMp[1]	WDMp[2]	BDMr[1]	WDMr[1]	BDMr[2]	BR	WR	BL	WL	BI	WI
Eurasian Jay *Garrulus g. rufitergum*	G														*	
Blue Tit *Cyanistes caeruleus obscurus*	G														*	
Great Tit *Parus major newtoni*	G														*	
Crested Tit *Lophophanes cristatus scoticus*	G														*	
Coal Tit *Periparus ater britannicus*	G														*	
Skylark *Alauda arvensis scotica*	R			*											*	
Shore Lark *Eremophila alpestris flava*	A											*				
House Martin *Delichon u. urbicum*	A			*	*											
Long-tailed Tit *Aegithalos caudatus rosaceus*	G														*	
Willow Warbler *Phylloscopus t. trochilus*	A			*	*											
Dartford Warbler *Sylvia undata dartfordiensis*	A		*										*			
Short-toed Treecreeper *Certhia brachydactyla megarhyncha*	A										*					
'Hebridean Wren' *Troglodytes troglodytes hebridensis*	G														*	
'Shetland Wren' *Troglodytes t. zetlandicus*	G														*	
Wren *Troglodytes troglodytes indigenus*	G														*	
'Shetland Starling' *Sturnus vulgaris zetlandicus*	R														*	
Dipper *Cinclus cinclus gularis*	A			*											*	
Dipper *Cinclus c. hibernicus*	A														*	
Common Redstart *Phoenicurus p. phoenicurus*	A									*						
Dunnock *Prunella modularis occidentalis*	A				*										*	
'Blue-headed Wagtail' *Motacilla f. flava*	R										*	*				
'Grey-headed Wagtail' *Motacilla f. thunbergi*	R											*				
Pied Wagtail *Motacilla alba yarrellii*	G														*	
*'White Wagtail' *Motacilla a. alba*	G										*					
Meadow Pipit *Anthus p. pratensis*	A				*											
Meadow Pipit *Anthus p. whistleri*	A														*	
Water Pipit *Anthus s. spinoletta*	A											*				
Rock Pipit *Anthus p. petrosus*	G														*	

Table 8. Races on the *BoCC4* Amber list and the criteria under which they qualify. (cont.)

Species[c] / Race	*BoCC4* species[a]	ERLOB	HDrec	BDMp[1]	BDMp[2]	WDMp[1]	WDMp[2]	BDMr[1]	WDMr[1]	BDMr[2]	BR	WR	BL	WL	BI	WI
Common Chaffinch *Fringilla coelebs gengleri*	G														*	
Bullfinch *Pyrrhula pyrrhula pileata*	A				*										*	
Linnet *Linaria cannabina autochthona*	R			*											*	
*Common Redpoll *Acanthis f. flammea*	A											*				
Goldfinch *Carduelis carduelis britannica*	G														*	
Snow Bunting *Plectrophenax n. nivalis*	A										*					
Snow Bunting *Plectrophenax nivalis insulae*	A										*					
Lapland Bunting *Calcarius l. lapponicus*	A											*				
Lapland Bunting *Calcarius l. subcalcaratus*	A											*				
Reed Bunting *Emberiza s. schoeniclus*	A				*											

[a] *BoCC4* assessments for 'parent' species: R = Red, A = Amber, G = Green

[b] Amber-list criteria:

ERLOB: Threatened in Europe. HDrec: historical decline – recovery. BDMp[1/2]: moderate breeding population decline over 25 years/longer term. WDMp[1/2]: moderate non-breeding population decline over 25 years/longer term. BDMr[1/2]: moderate breeding range decline over 25 years/longer term. WDMr[1]: moderate non-breeding range decline over 25 years. BR/WR: breeding/non-breeding rarity. BL/WL: breeding/non-breeding localisation. BI/WI: breeding/non-breeding international importance.

[c] Asterisks indicate species with a changed race-level status since *BoCC3*.

This table lists Amber-listed races of polytypic species only: it does not include monotypic species, e.g. Pink-footed Goose *Anser brachyrhynchus*.

Table 9. Races on the *BoCC4* Green list.

Species / Race	*BoCC4* species[a]	Species / Race	*BoCC4* species[a]
Goosander *Mergus m. merganser*	G	Goldcrest *Regulus r. regulus*	G
Little Egret *Egretta g. garzetta*	G	Firecrest *Regulus i. ignicapilla*	G
Grey Heron *Ardea c. cinerea*	G	Blue Tit *Cyanistes c. caeruleus*	G
Little Grebe *Tachybaptus r. ruficollis*	G	Great Tit *Parus m. major*	G
Great Crested Grebe *Podiceps c. cristatus*	G	Coal Tit *Periparus a. ater*	G
Northern Goshawk *Accipiter g. gentilis*	G	Coal Tit *Periparus a. hibernicus*	G
Eurasian Sparrowhawk *Accipiter n. nisus*	G	Bearded Tit *Panurus b. biarmicus*	G
Common Buzzard *Buteo b. buteo*	G	Woodlark *Lullula a. arborea*	G
Golden Eagle *Aquila c. chrysaetos*	G	Sand Martin *Riparia r. riparia*	G
Water Rail *Rallus a. aquaticus*	G	Barn Swallow *Hirundo r. rustica*	G
Moorhen *Gallinula c. chloropus*	G	Cetti's Warbler *Cettia c. cetti*	G
Common Coot *Fulica a. atra*	G	Common Chiffchaff *Phylloscopus c. collybita*	G
Little Ringed Plover *Charadrius dubius curonicus*	G	Willow Warbler *Phylloscopus trochilus acredula*	A
Ringed Plover *Charadrius hiaticula tundrae*	R	Blackcap *Sylvia a. atricapilla*	G
Dunlin *Calidris alpina arctica*	A	Garden Warbler *Sylvia b. borin*	G
Long-tailed Skua *Stercorarius l. longicaudus*	G	Lesser Whitethroat *Sylvia c. curruca*	G
Razorbill *Alca t. torda*	A	Common Whitethroat *Sylvia c. communis*	G
Little Auk *Alle a. alle*	G	Reed Warbler *Acrocephalus s. scirpaceus*	G
Black Tern *Chlidonias n. niger*	G	Waxwing *Bombycilla g. garrulus*	G
Lesser Black-backed Gull *Larus fuscus intermedius*	A	Eurasian Nuthatch *Sitta europaea caesia*	G
Herring Gull *L. a. argentatus*	R	Eurasian Treecreeper *Certhia familiaris britannica*	G
Rock Dove/Feral Pigeon *Columba l. livia*	G	Wren *Troglodytes t. troglodytes*	G
Wood Pigeon *Columba p. palumbus*	G	Blackbird *Turdus m. merula*	G
Collared Dove *Streptopelia d. decaocto*	G	Song Thrush *Turdus p. philomelos*	R
Barn Owl *Tyto a. alba*	G	Redwing *Turdus iliacus coburni*	R
Long-eared Owl *Asio o. otus*	G	Robin *Erithacus r. rubecula*	G
Green Woodpecker *Picus v. viridis*	G	Robin *Erithacus r. melophilus*	G
Hobby *Falco s. subbuteo*	G	European Stonechat *Saxicola rubicola hibernans*	G
Peregrine Falcon *Falco p. peregrinus*	G	Northern Wheatear *Oenanthe o. oenanthe*	G
Magpie *Pica p. pica*	G	'Greenland Wheatear' *Oenanthe o. leucorhoa*	G
Eurasian Jay *Garrulus g. glandarius*	G	Dunnock *Prunella m. modularis*	A
Jackdaw *Corvus m. monedula*	G	Dunnock *Prunella m. hebridium*	A
Jackdaw *Corvus m. spermologus*	G	Rock Pipit *Anthus petrosus littoralis*	G
Rook *Corvus f. frugilegus*	G	Common Chaffinch *Fringilla c. coelebs*	G
Carrion Crow *Corvus c. corone*	G	Greenfinch *Chloris c. chloris*	G
Hooded Crow *Corvus c. cornix*	G	Common Crossbill *Loxia c. curvirostra*	G
Common Raven *Corvus c. corax*	G		

[a] *BoCC4* assessments for 'parent' species: R = Red, A = Amber, G = Green.
This table lists Green-listed races of polytypic species only: it does not include monotypic species, e.g. Brambling *Fringilla montifringilla*.

Discussion

The growing Red list

BoCC4 has placed more species onto the Red list than ever before. Some 67 species are Red-listed (27.5% of the species assessed) and that list has grown by a substantially larger increment than in any previous *BoCC* review (fig. 2). In total, 20 species have moved to Red, with only three species moving from Red to Amber.

The Red list increased substantially between the second and third *BoCC* reviews but a number of those additions were due to changes to the assessment process. In particular, the introduction of the longer-term time window for consideration of population and range trends resulted in 11 species moving to (or staying on) the Red list that would not otherwise have done so. This is not the case here; only Merlin has returned to the Red list as a consequence of changes to the way we treat recovery from historical decline. The other significant change in our process is the treatment of conservation concern at a European level because we lack a current SPEC assessment. This has resulted

in a number of species that may otherwise have been Amber-listed being moved to the Green list; the Green list grew by 13 species, of which nine (or possibly more) may have been Amber-listed had we been able to retain the use of SPEC. Some of these species continue to merit conservation attention, including Red-billed Chough *Pyrrhocorax pyrrhocorax*, which remains relatively rare and range-restricted in the UK; and Golden Eagle, also relatively rare and range-restricted in the UK, due to persecution, both historical and recent (Whitfield *et al.* 2007).

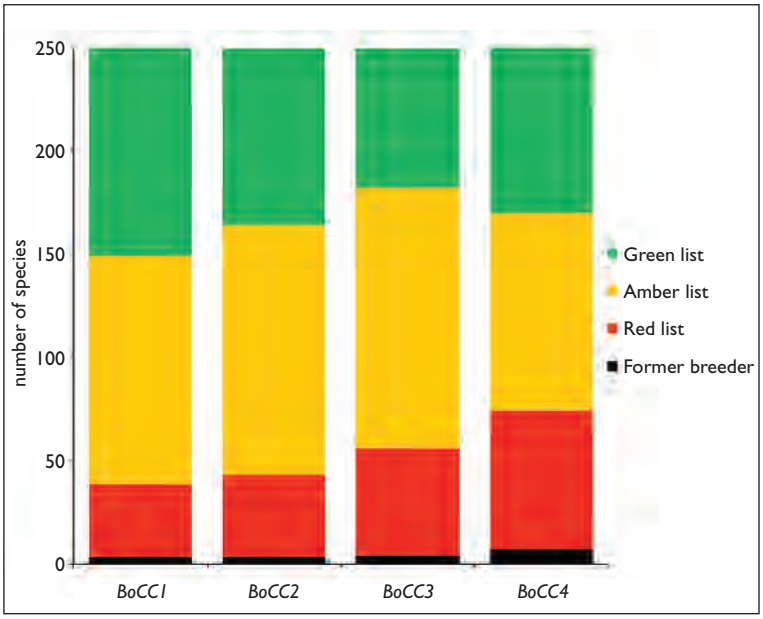


Fig. 2. Lengths of Red, Amber and Green lists in the four *BoCC* assessments. Note that the assessment process has developed over time, with changes in data availability and criteria between assessments, and a small number of changes in Red, Amber and Green list lengths have been as a consequence of these changes.

A priority list such as *BoCC4*, or a national IUCN Red List, should not, however, be the only consideration in decisions on which species should be the recipients of conservation effort. As well as *BoCC* status, we encourage the consideration of other factors, such as likelihood of conservation action being successful, the logistics of such action and synergies with other conservation activi-



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426. The Whinchat *Saxicola rubetra* moves from Amber to the Red list in *BoCC4*, and is a member of two distinct groupings to cause concern – upland species and Afro-Palearctic migrants.

ties. And while we might expect most Red-listed species to be the highest priorities for conservation, there are some on which it might not be appropriate to expend scarce conservation resources. These might include species at the edge of their European range in the UK, for which the factors that determine their abundance in the UK may lie elsewhere. Conversely, there are species on the *BoCC* Amber list that have been, and may continue to be, high priorities for conservation action, especially ones that might be considered as conservation dependent. There have been a number of noteworthy conservation successes in the UK due to the delivery of targeted and well-informed conservation action for priority bird species. While many of these, such as Corn Crake *Crex crex* and Cirl Bunting, remain Red-listed, we should celebrate the movement of others from Red to Amber, such as Red Kite and Marsh Harrier in *BoCC2*, Stone-curlew and Woodlark in *BoCC3*, and Eurasian Bittern *Botaurus stellaris* and European Nightjar *Caprimulgus europaeus* (as well as Red Kite moving to the Green list) in *BoCC4*. Simply because a species moves from Red to Amber does not, however, necessarily mean that conservation effort can be withdrawn immediately, as many remain dependent upon conservation action. A good example is the Stone-curlew. A large part of the UK population nests in arable fields, in which labour-intensive interventions are required to protect the birds from agricultural operations; an abrupt cessation of that effort would most likely result in the Stone-curlew's return to the Red list. Work is ongoing to encourage more birds to nest in semi-natural grasslands or in safe nesting plots on arable land, supported by agri-environment schemes, paving the way for a more sustainable population.

Themes in bird conservation in the UK, as highlighted by *BoCC4*

Some consistent themes have emerged from previous assessments and other overviews of the status of the UK's biodiversity (e.g. Burns *et al.* 2013), and this review largely reiterates these. Our overriding concern is for the ever-increasing number of species on the Red list: despite a proven ability to improve the status of species of concern, the rate at which species are added to the Red list greatly exceeds our current ability to take recovery action. If we believe that the presence of species on Red lists is an effective barometer of the state of our wildlife (e.g. Butchart *et al.* 2005), then this review paints a bleak picture.

In addition to the increase in the number of species on the Red list, three species have moved to the list of former breeders. Although this is loss at a UK rather than global scale, and while for highly mobile taxa such as birds recolonisation can never be ruled out, these losses should not be overlooked. In particular, Wryneck becomes the first once-widespread species to have been lost from the UK since the extinction of the Great Bustard *Otis*



Roger Riddington

427. Concerns about the state of the UK's internationally important seabird populations is heightened by the *BoCC4* review, with three familiar species moving to the Red list, the Puffin *Fratercula arctica* as a result of its IUCN listing as Vulnerable.

tarda in around 1833. It is a sobering thought that the Wryneck was once sufficiently common for the RSPB to sell nestboxes for it.

That no new farmland birds have moved to the Red list probably reflects the fact that the species which continue to be affected adversely by modern agricultural methods are already listed there. Although the trends of some of these species have levelled out in recent years, others continue to decline; most alarmingly in the case of Turtle Dove, which has declined by 13% per annum since 1995 (Harris *et al.* 2015). Declines in woodland specialists (as opposed to generalists, which on the whole have been doing well; Defra 2014) were highlighted in *BoCC3*, and this review adds three more woodland birds, Woodcock, Common Nightingale *Luscinia megarhynchos* and Pied Flycatcher, to the Red list. There are now 16 woodland species on the Red list, more than any other habitat group, although a higher proportion of farmland species are Red-listed (fig. 3).

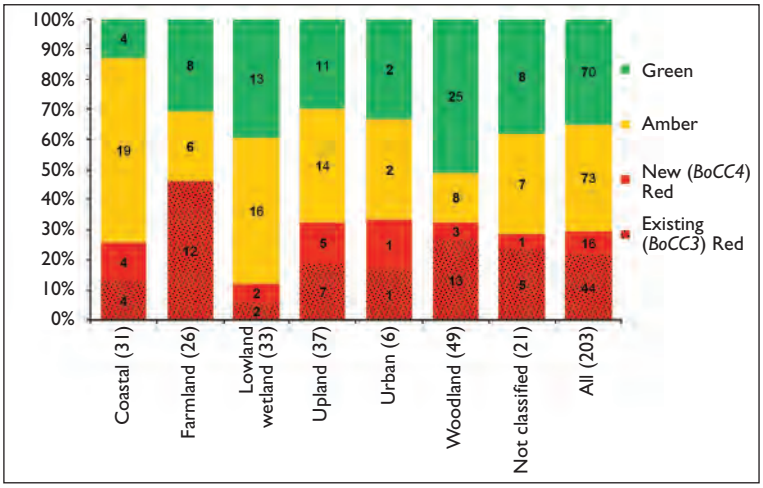


Fig. 3. Proportion of breeding birds in the Red, Amber and Green lists by major habitat type (habitat categories follow Gibbons *et al.* 1993). Bars show percentages in the Red, Amber and Green lists, figures give the actual number of species.

The greatest increases in the proportion of species Red-listed are for birds breeding in upland and coastal habitats (five and four



Jeff & Allison Kew/BTO

428. Another woodland specialist and long-distance migrant, the Common Nightingale *Luscinia megarhynchos* shows such a severe decline in breeding numbers that it is now Red-listed.

species respectively). The increase in coastal species chiefly reflects the deteriorating status of the UK's seabirds; with the addition of Kittiwake *Rissa tridactyla*, Shag and Puffin, the number of seabirds on the Red list has nearly doubled. Furthermore, with Razorbill *Alca torda* now considered as globally Near Threatened (BirdLife International 2015), there is growing concern for our seabirds, particularly as in global terms they are among the most important components of the UK's avifauna. We should also note that, with the addition of Velvet Scoter and Long-tailed Duck, four of the UK's seaducks are now on the Red list, although the causes of their declines may be different from and possibly unrelated to marine impacts.

The recent *Bird Atlas 2007–11* (Balmer *et al.* 2013) highlighted two areas of concern that, arguably, have not before been recognised as being among the UK's highest conservation priorities: declines in the ranges of both breeding waders and upland breeding species (and there is, of course, much overlap between these two groups). *BoCC4* lends support for this view. The addition of five upland breeding species to the Red list – Dotterel, Eurasian Curlew *Numenius arquata*, Merlin, Whinchat *Saxicola rubetra* and Grey Wagtail *Motacilla cinerea* – means that there are as many species of upland birds Red-listed as there are farmland birds. In total, there are now nine species of wader on the Red list, and while the drivers of the declines are likely to be varied, it is clear that this group is under pressure (of 22 wader species breeding in the UK, only two remain on the Green list). Brown *et al.* (2015) argued that Eurasian Curlew should currently be considered the UK's most pressing bird conservation priority, given the global concern (Near Threatened) for the species, the significance of the UK's breeding population and the rapid decline in that population.



Andy Hay/RSPB-images

429. The UK holds about half the world's population of Greenland White-fronted Geese *Anser albifrons flavirostris* in winter. The most recent census results (2014/15) indicate the lowest numbers in Britain for 30 years. The ultimate causes of a collapse in productivity remains poorly understood, but probably relates to changing spring weather conditions and competition with Canada Geese *Branta canadensis* on the breeding areas – probably acting in combination.

Another concern raised by the *BoCC3* assessment was population decline in a growing number of long-distance migrants, particularly those that winter in sub-Saharan Africa, and more specifically in the humid tropics (which have shown greater recent declines than species wintering in other regions; Hayhow *et al.* 2014). A further three Afro-Palearctic migrants, Common Nightingale, Pied Flycatcher and Whinchat, moved to the Red list in this review, and declines have continued in the majority of those listed already.

Climate change may be behind some of the changes in listings reported here. Many species are thought to benefit from climate change (e.g. Pearce-Higgins *et al.* 2013), and the population increases in Little Egret *Egretta garzetta* and Firecrest *Regulus ignicapilla*, which have resulted in their move to the Green list, are likely to be at least partly in response to the UK's warming climate. Other species may be adversely affected by the UK's changing climate, including those at the southern edge of their range for which the 'climatic envelope' (the area within which climatic conditions are suitable for a species) is moving away from the UK (Huntley *et al.* 2007). This could be the case, for example, for Dotterel, although other pressures, such as increased nitrogen deposition and grazing, may have caused its decline (Hayhow *et al.* 2015). Other climate change impacts include the shifting of wintering ranges, which has led to UK population declines in White-fronted Goose and Ringed Plover *Charadrius hiaticula*, and the influence of climate upon marine food chains, which is affecting the food supplies of the Kittiwake (Frederiksen *et al.* 2007) and other seabirds.



Ben Hall/RSPB-images

430. The Greenfinch *Chloris chloris* is Green-listed as a species in this review, yet the British race *C. c. harrisoni* is Red-listed as a result of recent decline, driven by outbreaks of the parasitic disease trichomonosis.

BoCC at the race level

This was the second *BoCC* assessment to look at the status of regularly occurring races of birds in the UK, and we believe that they serve as a useful complement to the species-level assessments. We recommend that they are used to draw distinctions between the differing status of races of the same species, enabling better targeted conservation action – for example towards the nominate race of Black-tailed Godwit rather than the prospering Icelandic race *L. l. islandica*. In addition, we should highlight the precarious status of some races that are endemic, or nearly so, to the UK. While the loss of Wryneck as a UK breeding species is to be lamented, our birds were of the nominate race, which is still found widely across Europe; the rapidly declining British populations of Lesser Spotted Woodpecker *Dendrocopos minor comminutus* and Willow Tit *Poecile montana kleinschmidti* are of endemic races, so if lost would be gone forever.

The future of *BoCC*

While *BoCC* assessments provide a clear foundation for identifying priority bird species, this is not the only way of doing so, and indeed a different approach has been used to identify priority species for the UK's devolved administrations. Assessment against the *BoCC* criteria is rather a 'data-hungry' process, designed around the evidence available for birds, but it is simply not possible to replicate this approach for most other taxa, for which our knowledge is much poorer. This leaves birds as an exception to the growing practice of conducting national (usually for Great Britain, although sometimes for Britain and Ireland and occasionally for individual nations) Red List assessments using IUCN criteria (IUCN

2012). Burns *et al.* (2013) found British Red List assessments for 6,225 species of wildlife, but in the two years since then new assessments have been published, or are near publication, for many groups. It may be that while maintaining the series of *BoCC* assessments we also need to consider a national IUCN Red List assessment for birds, to enable a level playing field when assessing conservation priorities across all of the UK's biodiversity. We do, however, retain reservations about the regional IUCN Red Listing process, and the suitability of assessments focused on extinction risk alone for conservation prioritisation and action in the UK (see Eaton *et al.* 2005).

At present, *BoCC* and other priority-listing approaches are based solely on the current status of species, and give no consideration of likely future changes. We know that our environment is undergoing rapid changes, which will affect our bird populations for better or worse. For example, Huntley *et al.* (2007) used climate envelope modelling to show how the ranges of European breeding species were likely to move north and east in response to climate change by the late twenty-first century. As a consequence, we suspect that conditions in the UK might become more favourable for some species, but less favourable for others. Ausden *et al.* (2015) predicted which species are likely to be gained and lost as breeding species in the UK, forecasting the arrival of Short-toed Eagle *Circaetus gallicus* and Melodious Warbler *Hippolais polyglotta* among others, but also the climate-driven loss of breeding species such as Common Scoter *Melanitta nigra* and Pintail. This prompts the question of whether our priority setting should consider predicted future change, although it is not immediately clear how those predicted changes should be treated. Should we list species that have yet to begin breeding in the UK, to help ensure that we are ready for them when they do? After all, conserving those species for which lower latitudes are becoming less suitable is likely to become increasingly important.

The *BoCC* Red list is now lengthy, and contains a spread of species for which we have varying conservation concern. Some are considered to be under the threat of extinction globally, or are undergoing dramatic declines here that may lead to extinction in the UK – Willow Tit, Turtle Dove and Capercaillie, to name just three of the 19 species suggested as being at high risk of UK extinction by Ausden *et al.* (2015). Other Red-listed species, while still much-depleted from



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431. The Green Woodpecker *Picus viridis* is one of 22 species moving from Amber to Green, reflecting its improved status in Europe.

previous levels, have shown stable or even increasing trends in recent years, for example Song Thrush *Turdus philomelos*.

This fourth *BoCC* assessment now sits within the six-year cycle of reporting to the European Commission, and we anticipate future *BoCC* reviews remaining so. A timetable for EU reporting requirements, the production of new UK population estimates by APEP, and new European Red List assessments should enable us to produce the fifth *BoCC* in 2021. In the intervening period, it is vital that we maintain the monitoring programmes that *BoCC* relies upon, and continue to work with and support the UK's many thousands of dedicated birdwatchers to improve our evidence base. As mentioned previously, gaps in data remain, and while we are enduring lean times for the funding of conservation activities, we should strive to find efficient and imaginative ways of improving our monitoring to ensure that species do not slip through the net. Most importantly, we argue that there should be no let-up in our conservation action for the species most in need of it.

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