

Birds of Conservation Concern in Ireland 2014–2019

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This is the third assessment of the status of all regularly occurring birds on the island of Ireland. The criteria on which the assessment is based include international conservation status, historical breeding declines, recent population declines (numbers and range in breeding and non-breeding seasons), European conservation status, breeding rarity, localised distribution, and the international importance of populations. Of the 185 species assessed, 37 were placed on the Red list, 90 on the Amber list and 58 on the Green list. The number of Red-listed species has increased by twelve and Amber-listed species by five since the previous review in 2007. Additions to the Red list include the wintering populations of six duck species and to the Red and/or Amber list a suite of passerines which have undergone population declines and/or range contractions. Populations of breeding waders continue to decline and the long-term future for these species is uncertain. We identify ongoing requirements for continued or improved monitoring of Irish birds essential to identifying those species or groups of greatest conservation concern. We recommend a repeat survey of breeding seabirds, increased coverage of common species through existing and new breeding bird surveys, and more frequent and improved surveys or monitoring protocols for scarcer species and groups such as raptors and breeding waders.

Introduction

Periodic reviews of the status of biodiversity are widely recognised as an important step in conservation priority-setting, and are used in many parts of the world. The concept of a ‘traffic light system’, whereby the status of species is reviewed against a set of quantitative criteria and allocated to Red, Amber and Green lists provides a transparent and readily understandable mechanism for identifying priorities. This approach has been used in Ireland (hereafter referring to the land area of the jurisdictions of Northern Ireland (NI) and the Republic of Ireland (RoI)) (e.g. Lynas *et al.* 2007), and the United Kingdom (UK) (e.g. Eaton *et al.* 2009). Here, Red-listed species are those of highest conservation priority, Amber-listed species those which are of lesser priority and Green-listed species those of least conservation priority.

In Ireland, the publication of the Irish Red Data Book in 1993 (Whilde 1993) was the first attempt at establishing the conservation status of birds, mammals, amphibians and fish on the island. The first comprehensive analysis of the conservation status of Irish birds was undertaken by Newton *et al.* (1999, ‘BoCCI1’) and was followed by a further assessment in 2007 by Lynas *et al.* (2007, ‘BoCCI2’). In this third assessment (hereafter ‘BoCCI3’), we continue to adopt an all-Ireland approach on the basis that bird populations on the island should be considered a distinct biogeographical unit (Lynas *et al.*). In the first assessment (BoCCI1), Newton *et al.* (1999) considered the Republic of Ireland and Northern Ireland

Plate 241. Grey Wagtail – straight from Green to Red listed (M.O’Clery).

separately but produced an all-Ireland list in which 18 species were Red-listed and a further 77 Amber-listed. This highlighted severe range declines affecting a suite of species, including lowland farmland and wet grassland birds (Corncrake *Crex crex*, Barn Owl *Tyto alba*, Yellowhammer *Emberiza cintrinella*), and upland birds (Red Grouse *Lagopus lagopus scotica*, Curlew *Numenius arquata*, Ring Ouzel *Turdus torquatus*), and in doing so, helped identify key areas for conservation priority-setting across the island. BoCCI2 (Lynas *et al.* 2007) saw the addition of 11 species to the Red list and 22 to the Amber list. Data from the BWI/NPWS Countryside Bird Survey (CBS) and the BWI/NPWS Irish Wetland Bird Survey (I-WeBS) in RoI, and the BTO/JNCC/RSPB Breeding Bird Survey (BBS) and the BTO/JNCC/RSPB Wetland Bird Survey (WeBS) in NI were used to generate all-Ireland trends for both common breeding birds and wintering waterbirds. This allowed the Red list to be split on the basis of breeding and passage/wintering occurrence. Wintering populations of waterbirds including Bewick's (Tundra) Swan *Cygnus columbianus bewickii*, Shoveler *Anas clypeata* and Knot *Calidris canutus* joined the Red list, as did breeding populations of Golden Plover *Pluvialis apricaria*, and Herring Gull *Larus argentatus*. Increases in populations of Hen Harrier *Circus cyaneus*, Roseate Tern *Sterna dougallii* and Chough *Pyrrhocorax pyrrhocorax* saw these species move from the Red to the Amber list.

The priorities defined through BoCCI2 provided the focus for a programme of conservation actions by *inter alia* RSPB and BirdWatch Ireland. Both organisations focused their conservation efforts on Red-listed species that benefit from intervention including, for example, Corncrake, Barn Owl, Yellowhammer and breeding waders. These interventions have resulted in localised successes (e.g. Yellowhammer; Colhoun *et al.* 2013a) that demonstrate how recovery can be achieved at larger spatial scales. The publication of BoCCI2 also helped the governments in both jurisdictions identify their priorities for bird conservation. In RoI, past failures in implementing legislation to adequately protect 'priority, migratory and dispersed' bird species in the wider countryside led to the development of group species action plans for Irish birds, within a framework of ten broad habitat types. These plans highlighted key targets and conservation measures for species, and species groups in Ireland (BirdWatch Ireland 2011).

Whilst significant data gaps remain, the ability to apply quantitative criteria has improved with successive BoCCI assessments. For breeding birds, the longer time series of data collected through CBS and BBS now enables the assessment of trends in abundance of 61 widespread species over a 13-year period. Similarly, the continuation of wetland bird surveys in both jurisdictions (WeBS and I-WeBS) has facilitated an all-Ireland analysis of wintering waterbirds over a 16-year period.

Periodic surveys of sensitive species such as Hen Harrier (Ruddock *et al.* 2012, Hayhow *et al.* 2013) and Common Scoter *Melanitta nigra* (Hunt *et al.* 2013) provide useful updates of population sizes and distribution. The recent publication of the *Bird Atlas 2007-11* (Balmer *et al.* 2013) has also proved valuable for the assessment of breeding range change since the first breeding atlas, covering 1968-72 (Sharrock 1976).

This review provides the most up-to-date assessment of the status of birds in Ireland using criteria established in previous BoCCI assessments (Newton *et al.* 1999, Lynas *et al.* 2007), assisted by access to more recent datasets.

Methods

Species list

We considered all regularly occurring species, including those on the Irish Rare Birds Committee (IRBC) Irish list (as of 31 December 2011; IRBC 2011), excluding vagrants or rarities unless they have bred in Ireland on at least one occasion during the period 2003-12. Recently introduced non-native species with self-sustaining breeding populations were also excluded as these were not considered to be of immediate conservation value. In general, the assessment is made for full species, rather than subspecies, races or distinct geographical populations. However, in the case of swans and geese, whose geographical flyways are well known, the assessment of international importance has been made against biogeographically discrete populations, as conservation action for these species is often targeted at this scale.

Listing criteria

The process of establishing the appropriate Red-Amber-Green listing category requires that individual species are assessed against a range of quantitative criteria. These criteria assess a number of important characteristics of populations such as changes in range and population size in Ireland, Europe and globally. Meeting one or more of these criteria qualifies a species for the relevant list with each species being listed according to the highest category for which they qualify. Red-listed species are those of highest conservation priority, being globally threatened, declining rapidly in abundance or range, or having undergone historic declines from which they have not recently recovered. Amber-listed species have an unfavourable status in Europe, have moderately declined in abundance or range, a very small population size, a localised distribution, or occur in internationally important numbers. Those species which are Green-listed do not meet any of these criteria and therefore require little direct conservation action. Since populations fluctuate, Green-listed species, together with those that are Red- and Amber-listed, need to be

adequately monitored so that future changes can be identified and appropriate action taken.

We have adopted broadly similar criteria to those used in previous BoCCI assessments in Ireland and the UK, and applied some changes where they might lead to improvements. These refinements are explained in the sections below.

Red list criteria

(1) IUCN: Global Conservation Status (Critically Endangered (CE), Endangered (E) or Vulnerable (V))

This criterion puts species' all-Ireland status into a global context, with any species classified as Globally Threatened (Critically Endangered, Endangered or Vulnerable, but not Near Threatened; IUCN 2008) being Red-listed. These species are recognised as the highest priorities for action at a global scale and are thus priorities at an all-Ireland level.

(2) European conservation status (SPEC 1)

This criterion puts the all-Ireland status into a European context. The conservation status of all European species was assessed most recently by BirdLife International (2004), one of the main changes in the revision being to include the IUCN Red list criteria. SPEC 1 species are those of global conservation concern (including those classified as Near Threatened) and are Red-listed.

(3) Historical decline in breeding population (HD)

Species which declined severely in the historic past (since 1800) but have not subsequently recovered are classified as Red-listed. As in the BoCCI2 assessment, we utilised a range of data sources in addition to those provided by Holloway (1996) and Gibbons *et al.* (1993). These included evidence provided in Ussher and Warren (1900), Kennedy *et al.* (1954), Ruttledge (1966), Hutchinson (1989), Whilde (1993) and D'Arcy (1999). Our assessment focused on whether a species had undergone a large and widespread population decline since 1800.

(4) Breeding population decline (BDp1 and BDp2)

Species whose populations have declined by at least 50% over 25 years have been Red-listed. Previous BoCCI assessments have applied this criteria based on the best available information for a period as close to 25 years as possible. For many species relatively short runs of monitoring data were available while CBS and BBS data has enabled the production of population trends at an all-Ireland level for 61 species covering the 13-year period 1998-2011. In this assessment we therefore apply the breeding population decline criteria over two time-separated time periods: short-term declines over 13

years (1998-2011) (BDp1), and longer-term declines over about 25 years (about 1980-2013) (BDp2). Declines in abundance of 50% or more in either time window qualifies the species for Red-listing status.

Data for other species come from a range of sources. In the case of seabirds, recent survey data collected at a subset of colonies during 2009-2013 is compared with the Seabird 2000 survey data (1998-2002; Mitchell *et al.* 2004), yielding changes in abundance over 7-15 year periods (BDp1). Comparing recent colony counts with the Seabird Colony Register 1985-88 (SCR; Lloyd *et al.* 1991) provides changes in abundance over 24-28 years (BDp2). Sources of information on individual species comes from single or multi-species surveys including those for Hen Harrier (Barton *et al.* 2006, Sim *et al.* 2007, Ruddock *et al.* 2012, Hayhow *et al.* 2013), Common Scoter (Heffernan & Hunt 2004, Hunt *et al.* 2012), breeding waders (Henderson *et al.* 2002, Colhoun *et al.* 2013b), Yellowhammer (Donaghy 1998), Twite *Carduelis flavirostris* (Langston *et al.* 2006, McLoughlin & Cotton 2008), Barn Owl (Lusby 2012), Chough (Gray *et al.* 2003) and Corncrake (RSPB/BWI/NPWS reports). Hillis (2003) provided population estimates and trends in abundance for a number of rare breeding bird species. Assessments under this criterion were not made for these rare breeding species, which may not breed annually, such as Red-necked Phalarope *Phalaropus lobatus*, given that even small changes in population size can equate to a very large decline proportionately.

(5) Non-breeding population decline (WDp1 and WDp2)

As with widespread breeding species, the availability of annual monitoring data on wintering waterbirds has improved steadily. We used two temporal windows for application of this criterion: the results of an all-Ireland analysis of 'short-term' trends in counts, combining WeBS and I-WeBS data for the 16-year period 1994 to 2010 (WDp1), and a long-term trend comparing population estimates for the period 2006-2010 (Crowe *et al.* 2008, Crowe & Holt 2013) with the national population estimates produced by Sheppard (1993) for the mid 1980s (about 25 years; WDp2). Declines in abundance of 50% or more in either time window qualifies the species for Red-listing status. Population trends were not calculated for a number of species covered by I-WeBS or WeBS for which the data from these surveys are considered unrepresentative of national populations (e.g. Great Northern Diver *Gavia immer* and Snipe *Gallinago gallinago*).

(6) Decline in breeding range (BDr1 and BDr2)

Declines in breeding range of 70% or more over 25 years conferred Red list status as was the threshold used in previous BoCCI assessments. We used data from all three Britain and

Ireland breeding atlases covering 1968-72 (Sharrock 1976), 1988-91 (Gibbons *et al.* 1993) and 2008-11 (Balmer *et al.* 2013) to assess range changes over two time periods: a 'short' time period of about 21 years comparing data from the recent breeding bird atlas (2008-11) with the preceding (1988-91; *BDr1*), and a 'longer' time period of about 40 years (1968-72 to 2008-2011) between the recent breeding bird atlas (2008-11) and the first atlas (1968-72; *BDr2*). The percentage change in the total number of occupied Irish 10-km squares was calculated using 'possible', 'probable' and 'confirmed' breeding categories from the recent atlas and using both 'breeding' or 'seen' categories from the previous atlases. Species present in fewer than 15 squares during both atlas periods were excluded from the analysis.

Amber list criteria

(2a) European conservation status (*SPEC 2* and *SPEC 3*)

As for Red list criterion but restricted to *SPEC 2* and *SPEC 3* species. These are not of global concern but have unfavourable conservation status in Europe. *SPEC 2* are species for which the global population is concentrated in Europe. *SPEC 3* species are those for which the global population is concentrated outside Europe.

(4a) Breeding population decline (*BDMp1* and *BDMp2*)

As for the equivalent Red list criterion but with a moderate decline in abundance of between 25% and 49% over 13 years (1998-2011) (*BDMp1*), or longer-term declines over about 25 years (about 1980-2013) (*BDMp2*).

(5a) Non-breeding population decline

(*WDMp1* and *WDMp2*)

Similar criteria to that for *WDP* but assigned to species exhibiting a moderate decline in abundance of 25% to 49% over the short (17 years 1994-2010: *WDMp1*), or longer-term (about 30 years: mid-1980s to 2006-2010; *WDMp2*).

(6a) Decline in breeding range (*BRMr1* and *BRMr2*)

Equivalent to *BDr* Red-listed criteria but applying a moderate percentage change (35% to 69%) to qualify species for Amber-listing.

(7) Breeding rarity (*BR*)

This is an Amber-listed criterion, whereby qualifying species are those with fewer than 100 breeding pairs in Ireland and for which breeding was proven, or at least probable, during the period 2004-2012. The data to support this analysis were derived from the reports of the Irish Rare Breeding Birds Panel (Hillis 2006, 2007, 2008, 2009, 2010, 2011, 2012). To allow the

most contemporary data to be used, unpublished verified records already accepted by the IRBBP for the breeding seasons of 2011 and 2012 were included.

(8) Localised breeding or wintering populations

(*BL* or *WL*)

Where 50% or more of the total Irish breeding population is concentrated into ten or fewer sites, then the population is considered localised and therefore vulnerable (*BL*). Those species for which there are fewer than 100 pairs in Ireland were excluded from this analysis as by their nature, such species are likely to be localised. Similarly, if more than half of the wintering population is also limited to ten or fewer sites then the non-breeding population was considered localised (*WL*). For colonial seabirds, the results of Seabird 2000 (Mitchell *et al.* 2004) were used to identify localised distributions. For wintering waterbirds the results of WeBS and I-WeBS informed the listing process. Due to the paucity of data, it was not possible to complete this analysis for other species.

(9) International importance during the breeding or non-breeding season (*BI* or *WI*)

Where the Irish population represents more than 20% of the European population in either the breeding or wintering seasons, then the species is considered to be of international importance and qualifies for the Amber list. European population estimates were taken from BirdLife International (2004). Population estimates for breeding seabirds in Ireland were taken from Mitchell *et al.* (2004) and for wintering waterbirds from Crowe & Holt (2013). For non-breeding waterbirds all-Ireland population estimates were assessed against the estimates published by Wetlands International (2002, 2012), given that the populations of these species in Ireland are known to be biogeographically discrete from other populations in Europe and merit a separate assessment of conservation status.

Results

Of the 185 regularly occurring species reviewed, this assessment places 37 species (20% of the total) on the Red list, 90 (49%) species on the Amber list and the remaining 58 (31%) species on the Green list (Tables 1, 2 and 3).

The revised Red list (Table 1) includes 12 additional species and only one species (Knot) has been removed from the previous list. Amongst the newly Red-listed species eight move from Amber to Red, a newly assessed species has gone straight to Red (White-tailed Eagle *Haliaeetus albicilla*) and four move directly from Green to Red (Table 4). Changes in international conservation status explain three additions to the Red list – Long-tailed Duck *Clangula hyemalis* and Velvet



Plate 242. Long-tailed Duck – from Green listed to Red listed (John Fox).

Scoter *Melanitta fusca* have acquired IUCN Globally Threatened status, and Leach's Storm Petrel *Oceanodroma leucorhoa* has acquired *SPEC 1* status. Of the seven species classified on the basis of having experienced historical declines, all but one (Grey Partridge *Perdix perdix*) are classified as rare breeders, with fewer than 100 pairs breeding annually.

The addition of White-tailed Eagle to the Red list, a re-introduced species which previously suffered a historic decline and eventual extinction (Holloway 1996, D'Arcy 1999), was due to a successful first breeding attempt in 2013 (GET 2013). Declines in wintering populations led to the Red-listing of several wintering waterbirds (Wigeon *Anas penelope*, Pochard *Aythya ferina*, Tufted Duck *Aythya fuligula*, Goldeneye *Bucephala clangula* and Dunlin *Calidris alpina*) while declines in breeding populations accounted for changes in status of just two species – Grey Wagtail *Motacilla cinerea* and Meadow Pipit *Anthus pratensis* (Table 5). Large declines in the breeding ranges of Whinchat *Saxicola rubetra* and Woodcock *Scolopax rusticola* (Balmer *et al.* 2013) account for their addition to the Red list. Historical declines of Black-necked Grebe *Podiceps nigricollis*, Golden Eagle *Aquila chrysaetos*, Grey Partridge, Quail *Coturnix coturnix*, Red-necked Phalarope and Nightjar *Caprimulgus europaeus*, whose populations remain small, ensure these species remain on the Red list (Table 6). Other species whose Red-listed status remains unchanged, due to large (>50%) population declines, include wintering populations of Bewick's Swan (long and short-term declines), Shoveler and Pintail *Anas acuta* (long-term only). With large (>50%) short-term changes in wintering populations for Lapwing *Vanellus vanellus*, Golden Plover and Dunlin, these species now qualify for Red-listing in respect to both their breeding and wintering populations (Table 5).

The Amber list (Table 2) has increased to 90 species, five more than in the last (BoCCI2) assessment (Lynas *et al.* 2007). Three rare breeding species have moved straight to Amber on the basis that they have bred in the period since the last assessment – Marsh Harrier *Circus aeruginosus* (Scott *et al.* 2009), Little Ringed Plover *Charadrius dubius* (Collins 2008) and Great Spotted Woodpecker *Dendrocopos major* (Hillis 2011). With fewer than three pairs of Black-tailed Godwit *Limosa limosa* proven breeding in recent years (Table 6; Hillis 2010, 2011, 2012), the first records since 1996-99 (Hillis 2003), this species now qualifies under the rare breeder category. Six species move from Green to Amber listing, all on the basis of short-term declines in abundance of at least 25% (Sparrowhawk *Accipiter nisus*, Robin *Erithacus rubecula*, Stonechat *Saxicola rubicola*, Mistle Thrush *Turdus viscivorus*, Goldcrest *Regulus regulus*, Greenfinch *Carduelis chloris*) and the importance of the wintering population of Great Northern Diver qualifies this species for Amber status (Table 7). A further eight species which were incorrectly Green-listed in BoCCI2 (Lynas *et al.* 2007) are now Amber-listed (Table 4).

Of those species with improved status since the last assessment, Knot has moved from Red to Amber (Table 2), whilst Ringed Plover *Charadrius hiaticula* and Greenshank *Tringa nebularia* have moved from Amber to Green (Table 3). The changed status of Knot is due to a recent recovery in wintering numbers, while that of Ringed Plover and Greenshank is due to less than 50% of their respective populations occurring in ten or fewer sites over the assessed time period. Grasshopper Warbler *Locustella naevia* has moved from Amber to Green, the species trend showing a short-term increase in population size (54%) and range (74%). The remaining 58 species (31%) (Table 3) include those assessed but which either do not qualify under Red- or Amber-listed criteria, or there are insufficient data on which to apply the criteria.

Table 1. BoCCI2: Red-listed species and the criteria under which they qualify. IUCN = globally threatened under IUCN criteria. The status R (Red), A (Amber), G (Green) or N/A (Not applicable) in the previous BoCCI assessment (Lynas *et al.* 2007; BoCCI2) is shown. Category refers to primary occurrence for the species in Ireland (and assessed here) - breeding (B), passage (P) and wintering (W). See methods for full list of criteria codes; criterion with a suffix '1' refer to short-term declines whilst those identified with a '2' suffix refer to longer-term trends. The additional amber-listing criteria under which the red-listed species qualify is also shown.

Species	Red- listing criteria								Additional Amber-listing criteria under which species qualify															
	BoCCI2	Category	IUCN	HD	BDp1	BDp2	WDp1	WDp2	BDr1	BDr2	SPEC	BDMp1	BDMp2	WDMp1	WDMp2	BDMr1	BDMr2	BR	WR	BL	WL	BI	WI	
Black-necked Grebe <i>Podiceps nigricollis</i>	R	B		*														*						
Sooty Shearwater <i>Puffinus griseus</i>	R	P																						
Balearic Shearwater <i>Puffinus mauretanicus</i>	R	P	*																					
Leach's Storm Petrel <i>Oceanodroma leucorhoa</i>	A	B					*													*				
Bewick's Swan <i>Cygnus columbianus bewickii</i>	R	W					*															*		
Wigeon <i>Anas penelope</i>	A	W					*															*		
Pintail <i>Anas acuta</i>	R	W					*															*		
Shoveler <i>Anas clypeata</i>	R	W					*														*			
Pochard <i>Aythya ferina</i>	A	W					*														*			
Tufted Duck <i>Aythya tuftula</i>	A	W					*														*			
Long-tailed Duck <i>Clangula hyemalis</i>	G	W	*																					
Common Scoter <i>Melanitta nigra</i>	R	B							*															
Velvet Scoter <i>Melanitta fusca</i>	G	W	*																					
Goldeneye <i>Bucephala clangula</i>	A	W																			*			
White-tailed Eagle <i>Haliaeetus albicilla</i>	N/A	B		*																				
Golden Eagle <i>Aquila chrysaetos</i>	R	B		*																			*	
Red Grouse <i>Lagopus lagopus</i>	R	B																						

Table 2. BoCCI3: Amber-listed species and the criteria under which they qualify. The status R (Red), A (Amber), G (Green) or N/A (Not applicable) in the previous BoCCI assessment (Lynas *et al.* 2007; BoCCI2) is shown. Category refers to primary occurrence for the species in Ireland (and assessed here) - breeding (B), passage (P) and wintering (W). SPEC refers to European Conservation Status and the numbers in parentheses refer to the SPEC category 1, 2 or 3. See methods for full list of criteria codes; criterion with a suffix '1' refer to short-term declines whilst those identified with a '2' suffix refer to longer-term trends.

Amber-listing criteria under which species qualify

	BoCCI2	Category	SPEC	BDMp1	BDMp2	WDMp1	WDMp2	BDMr1	BDMr2	BR	WR	BL	WL	BI	WI
Red-throated Diver <i>Gavia stellata</i>	A	B	*(3)							*					
Black-throated Diver <i>Gavia arctica</i>	G	W	*(3)												
Great Northern Diver <i>Gavia immer</i>	G	W													*
Little Grebe <i>Tachybaptus ruficollis</i>	A	B/W					*								
Great Crested Grebe <i>Podiceps cristatus</i>	A	B/W				*							*		
Slavonian Grebe <i>Podiceps auritus</i>	A	W	*(3)												
Cory's Shearwater <i>Calonectris borealis</i>	A	P	*(2)												
Manx Shearwater <i>Puffinus puffinus</i>	A	B													
European Storm Petrel <i>Hydrobates pelagicus</i>	A	B										*		*	
Gannet <i>Morus bassanus</i>	A	B										*			
Cormorant <i>Phalacrocorax carbo</i>	A	B/W						*				*			
Shag <i>Phalacrocorax aristotelis</i>	A	B										*			
Mute Swan <i>Cygnus olor</i>	A	B/W												*	*
Whooper Swan <i>Cygnus cygnus</i>	A	W								*			*		*
Greenland White-fronted Goose <i>Anser albifrons</i>	A	W											*		*
Greylag Goose <i>Anser anser</i>	A	W											*		
Barnacle Goose <i>Branta leucopsis</i>	A	W											*		*
Light-bellied Brent Goose <i>Branta bernicla</i>	A	W	*(3)										*		*
Shelduck <i>Tadorna tadorna</i>	A	B/W											*		
Gadwall <i>Anas strepera</i>	A	B/W	*(3)							*			*		
Teal <i>Anas crecca</i>	A	B/W							*						
Garganey <i>Anas querquedula</i>	A	B	*(3)							*					
Scaup <i>Aythya marila</i>	A	W											*		
Eider <i>Somateria mollissima</i>	A	B/W											*		
Goosander <i>Mergus merganser</i>	A	B								*					
Red Kite <i>Milvus milvus</i>	A	B	*(2)							*					
Marsh Harrier <i>Circus aeruginosus</i>	N/A	B								*					
Hen Harrier <i>Circus cyaneus</i>	A	B	*(3)							*					
Goshawk <i>Accipiter gentilis</i>	A	B								*					
Sparrowhawk <i>Accipiter nisus</i>	G	B		*											
Kestrel <i>Falco tinnunculus</i>	A	B	*(3)												
Merlin <i>Falco columbarius</i>	A	B							*						
Spotted Crake <i>Porzana porzana</i>	A	B								*					
Coot <i>Fulica atra</i>	A	B/W				*	*		*				*		
Oystercatcher <i>Haematopus ostralegus</i>	A	B/W											*		
Little Ringed Plover <i>Charadrius dubius</i>	N/A	B								*					
Grey Plover <i>Pluvialis squatarola</i>	A	W					*						*		
Knot <i>Calidris canutus</i>	R	W	*(3)				*								
Ruff <i>Calidris pugnax</i>	A	P	*(2)												
Jack Snipe <i>Lymnocyptes minimus</i>	A	W	*(3)												
Snipe <i>Gallinago gallinago</i>	A	B/W	*(3)												
Black-tailed Godwit <i>Limosa limosa</i>	A	W	*(2)							*			*		*

Amber-listing criteria under which species qualify

	BoCCI2	Category	SPEC	BDMp1	BDMp2	WDMp1	WDMp2	BDMr1	BDMr2	BR	WR	BL	WL	BI	WI
Bar-tailed Godwit <i>Limosa lapponica</i>	A	W											*		
Spotted Redshank <i>Tringa erythropus</i>	G	P	*(3)												
Wood Sandpiper <i>Tringa glareola</i>	G	P	*(3)												
Common Sandpiper <i>Actitis hypoleucos</i>	A	B	*(3)												
Great Skua <i>Stercorarius skua</i>	A	B								*		*			
Mediterranean Gull <i>Larus melanocephalus</i>	A	B								*		*			
Little Gull <i>Hydrocoloeus minutus</i>	A	P	*(3)												
Common Gull <i>Larus canus</i>	A	B	*(2)					*							
Lesser black-backed Gull <i>Larus fuscus</i>	A	B						*				*			
Great black-backed Gull <i>Larus marinus</i>	A	B			*			*							
Kittiwake <i>Rissa tridactyla</i>	A	B		*											
Sandwich Tern <i>Sterna sandvicensis</i>	A	B	*(2)						*			*			
Roseate Tern <i>Sterna dougallii</i>	A	B	*(3)									*		*	
Common Tern <i>Sterna hirundo</i>	A	B						*	*			*			
Arctic Tern <i>Sterna paradisaea</i>	A	B						*	*			*			
Little Tern <i>Sternula albifrons</i>	A	B	*(3)					*	*			*			
Guillemot <i>Uria aalge</i>	A	B										*			
Razorbill <i>Alca torda</i>	A	B										*			
Black Guillemot <i>Cephus grylle</i>	A	B	*(2)												
Puffin <i>Fratercula arctica</i>	A	B	*(2)												
Stock Dove <i>Columba oenas</i>	A	B							*						
Turtle Dove <i>Streptopelia turtur</i>	A	B	*(3)												
Short-eared Owl <i>Asio flammeus</i>	A	B	*(3)							*					
Swift <i>Apus apus</i>	A	B		*											
Kingfisher <i>Alcedo atthis</i>	A	B	*(3)												
Great Spotted Woodpecker <i>Dendrocopos major</i>	N/A	B								*					
S skylark <i>Alauda arvensis</i>	A	B	*(3)	*											
Sand Martin <i>Riparia riparia</i>	A	B	*(3)												
Barn Swallow <i>Hirundo rustica</i>	A	B	*(3)												
House Martin <i>Delichon urbicum</i>	A	B	*(3)												
Yellow Wagtail <i>Motacilla flava</i>	A	B								*					
Robin <i>Erithacus rubecula</i>	A	B		*											
Redstart <i>Phoenicurus phoenicurus</i>	A	B	*(2)							*					
Stonechat <i>Saxicola rubicola</i>	G	B		*											
Wheatear <i>Oenanthe oenanthe</i>	A	B	*(3)												
Mistle Thrush <i>Turdus viscivorus</i>	G	B		*											
Reed Warbler <i>Acrocephalus scirpaceus</i>	A	B								*					
Lesser Whitethroat <i>Sylvia curruca</i>	A	B								*					
Wood Warbler <i>Phylloscopus sibilatrix</i>	A	B	*(2)							*					
Goldcrest <i>Regulus regulus</i>	G	B		*											
Spotted Flycatcher <i>Muscicapa striata</i>	A	B	*(3)												
Pied Flycatcher <i>Ficedula hypoleuca</i>	A	B								*					
Chough <i>Pyrhocorax pyrrhocorax</i>	A	B	*(3)												
Starling <i>Sturnus vulgaris</i>	A	B	*(3)												
House Sparrow <i>Passer domesticus</i>	A	B	*(3)												
Tree Sparrow <i>Passer montanus</i>	A	B	*(3)												
Greenfinch <i>Carduelis chloris</i>	G	B		*											
Linnet <i>Carduelis cannabina</i>	A	B	*(2)												

Table 3. BoCCI3: Green-listed species. The status R (Red), A (Amber), G (Green) or N/A (Not applicable) in the previous BoCCI assessment (Lynas *et al.* 2007; BoCCI2) is shown. Category refers to primary occurrence for the species in Ireland (and assessed here) - breeding (B), passage (P) and wintering (W).

Species	BoCC2 Category		Species	BoCC2 Category	
Fulmar <i>Fulmarus glacialis</i>	G	B	Blackbird <i>Turdus merula</i>	G	B
Great Shearwater <i>Puffinus gravis</i>	G	P	Grasshopper Warbler <i>Locustella naevia</i>	A	B
Little Egret <i>Egretta garzetta</i>	G	B	Sedge Warbler		
Grey Heron <i>Ardea cinerea</i>	G	B/W	<i>Acrocephalus schoenobaenus</i>	G	B
Pink-footed Goose <i>Anser brachyrhynchus</i>	G	W	Whitethroat <i>Sylvia communis</i>	G	B
Mallard <i>Anas platyrhynchos</i>	G	W	Garden Warbler <i>Sylvia borin</i>	G	B
Red-breasted Merganser <i>Mergus serrator</i>	G	B/W	Blackcap <i>Sylvia atricapilla</i>	G	B
Water Rail <i>Rallus aquaticus</i>	G	B	Chiffchaff <i>Phylloscopus collybita</i>	G	B
Buzzard <i>Buteo buteo</i>	G	B	Willow Warbler <i>Phylloscopus trochilus</i>	G	B
Peregrine <i>Falco peregrinus</i>	G	B	Long-tailed Tit <i>Aegithalos caudatus</i>	G	B
Moorhen <i>Gallinula chloropus</i>	G	B	Coal Tit <i>Parus ater</i>	G	B
Ringed Plover <i>Charadrius hiaticula</i>	A	W	Blue Tit <i>Cyanistes caeruleus</i>	G	B
Sanderling <i>Calidris alba</i>	G	W	Great Tit <i>Parus major</i>	G	B
Little Stint <i>Calidris minuta</i>	G	P	Treecreeper <i>Certhia familiaris</i>	G	B
Curlew Sandpiper <i>Calidris ferruginea</i>	G	P	Jay <i>Garrulus glandarius</i>	G	B
Purple Sandpiper <i>Calidris maritima</i>	G	W	Magpie <i>Pica pica</i>	G	B
Whimbrel <i>Numenius phaeopus</i>	G	P	Jackdaw <i>Corvus monedula</i>	G	B
Greenshank <i>Tringa nebularia</i>	A	W	Rook <i>Corvus frugilegus</i>	G	B
Green Sandpiper <i>Tringa ochropus</i>	G	P	Hooded Crow <i>Corvus cornix</i>	G	B
Ruddy Turnstone <i>Arenaria interpres</i>	G	W	Raven <i>Corvus corax</i>	G	B
Rock Dove <i>Columba livia</i>	G	B	Chaffinch <i>Fringilla coelebs</i>	G	B
Woodpigeon <i>Columba palumbus</i>	G	B	Brambling <i>Fringilla montifringilla</i>	G	W
Collared Dove <i>Streptopelia decaocto</i>	G	B	Goldfinch <i>Carduelis carduelis</i>	G	B
Cuckoo <i>Cuculus canorus</i>	G	B	Redpoll <i>Carduelis cabaret</i>	G	B
Long-eared Owl <i>Asio otus</i>	G	B	Crossbill <i>Loxia curvirostra</i>	G	B
Rock Pipit <i>Anthus petrosus</i>	G	B	Bullfinch <i>Pyrrhula pyrrhula</i>	G	B
Pied Wagtail <i>Motacilla alba</i>	G	B	Lapland Bunting <i>Calcarius lapponicus</i>	G	P
Dipper <i>Cinclus cinclus</i>	G	B	Snow Bunting <i>Plectrophenax nivalis</i>	G	W
Wren <i>Troglodytes troglodytes</i>	G	B	Reed Bunting <i>Emberiza schoeniclus</i>	G	B
Dunnock <i>Prunella modularis</i>	G	B			



Plate 243. Grasshopper Warbler – Green listed (Dick Coombes).

Table 4. Changes to the Red, Amber and Green lists between BoCCI2 and BoCCI3

Species	Reason for change in status
Species with worsened status	
Newly assessed: straight to Red	
White-tailed Eagle	Historical decline and SPEC 1
Green to Red	
Long-tailed Duck	IUCN Globally Threatened (Vulnerable)
Velvet Scoter	IUCN Globally Threatened (Endangered)
Meadow Pipit	Short-term decline in breeding population (>50%)
Grey Wagtail	Short-term decline in breeding population (>50%)
Amber to Red	
Leach's Storm Petrel	SPEC 1
Wigeon	Long-term decline in non-breeding population (>50%)
Pochard	Long- and short-term decline in non-breeding population (>50%)
Tufted Duck	Short-term decline in non-breeding population (>50%)
Goldeneye	Short-term decline in non-breeding population (>50%)
Dunlin	Short-term decline in breeding range (>70%); Long- and short-term decline in non-breeding population (>50%)
Woodcock	Long-term decline in breeding range (>70%)
Whinchat	Long-term decline in breeding range (>70%)
Newly listed: Amber	
Marsh Harrier	Rare breeder
Little Ringed Plover	Rare breeder
Great Spotted Woodpecker	Rare breeder
Green to Amber	
Great Northern Diver	International importance of the non-breeding population (>20%)
Sparrowhawk	Short-term decline in breeding population (> 25%)
Robin	Short-term decline in breeding population (> 25%)
Stonechat	Short-term decline in breeding population (> 25%)
Mistle Thrush	Short-term decline in breeding population (> 25%)
Goldcrest	Short-term decline in breeding population (> 25%)
Greenfinch	Short-term decline in breeding population (> 25%)
Species with improved status	
Red to Amber	
Knot	Short-term increase in wintering population
Amber to Green	
Ringed Plover	50% of the wintering population at > 10 sites
Greenshank	50% of the wintering population at > 10 sites
Grasshopper Warbler	Short-term Increase in breeding population (> 50%) and increase in range (short-term >70%; long-term 3%)
Species incorrectly classified in BoCCI2 as Green which should have been Amber	
Black-throated Diver	SPEC 3
Slavonian Grebe	SPEC 3
Smew	SPEC 3
Ruff	SPEC 2
Jack Snipe	SPEC 3
Spotted Redshank	SPEC 3
Wood Sandpiper	SPEC 3
Little Gull	SPEC 3

Table 5. Trends of Red- and Amber-listed species with declining populations or breeding ranges. Seasons refer to breeding (B) and non-breeding (NB).

Species	Season	Population trends			Range trends		
		25-year trend	Longer trend	Data source	25-year trend	Longer trend	Data source
Little Grebe	NB	-5%	-26%	WeBS/I-WeBS			
Great Crested Grebe	NB	-40%	+12%	WeBS/I-WeBS			
Mute Swan	NB	+43%	-76%	WeBS/I-WeBS			
Bewick's Swan	NB	-94%	-93%	WeBS/I-WeBS			
Wigeon	NB	-33%	-55%	WeBS/I-WeBS			
Teal	B				+11%	-47%	Breeding Atlases
Pintail	NB	+14%	-66%	WeBS/I-WeBS			
Shoveler	NB	+8%	-62%	WeBS/I-WeBS			
Pochard	NB	-59%	-56%	WeBS/I-WeBS			
Tufted Duck	NB	-52%	+44%	WeBS/I-WeBS			
Common Scoter	B	-46%	-63%	Partridge & Smith 1988; Hunt <i>et al.</i> 2012	-31%	-27%	Breeding Atlases
Goldeneye	NB	-52%	-40%	WeBS/I-WeBS			
Sparrowhawk	B	-33%	n/a	CBS/BBS	+19%	-2%	Breeding Atlases
Red Grouse	B	-50% (20y)		Gibbons <i>et al.</i> 1993; Cummins <i>et al.</i> 2010; Allen <i>et al.</i> 2005	+17%	-61%	Breeding Atlases
Grey Partridge	B				-66%	-95%	Breeding Atlases
Quail	B				-32%	-30%	Breeding Atlases
Corncrake	B	-83% (27y)	-91%	NPWS			
Coot	NB	-25%	-27%	WeBS/I-WeBS			
Golden Plover	B	-52% (10-15y)		UBS	-42%	-50%	Breeding Atlases
Golden Plover	NB	-66%	+110%	WeBS/I-WeBS			
Grey Plover	NB	-46%	+248%	WeBS/I-WeBS			
Lapwing	B	-74%	-85%	CBS/BBS; IRBBP	-33%	-52%	Breeding Atlases
Lapwing	NB	-68%	-40%	WeBS/I-WeBS			
Knot	NB	+9%	-37%	WeBS/I-WeBS			
Dunlin	B				-71%	-69%	Breeding Atlases
Dunlin	NB	-51%	-51%	WeBS/I-WeBS			
Curlew	B	-70%	-86%	CBS/BBS; IRBBP; A. Donaghy (BWI)	-73%	-78%	Breeding Atlases
Curlew	NB	-32%	-65%	WeBS/I-WeBS			
Redshank	B	-53% (11-14y)	n/a	Lauder & Donaghy 2008	-47%	-55%	Breeding Atlases
Black-headed Gull	B	-70% (10-17y)	n/a	Seabird 2000			
Great Black-backed Gull	B		-32%	Seabird 2000			
Herring Gull	B		-90%	Seabird 2000			
Little Tern	B		-35%	Seabird 2000			
Roseate Tern	B		-25%	BWI			
Barn Owl	B	-77% (20y)	n/a	IRBBP	+45%	-46%	Breeding Atlases
Nightjar	B	n/a			-55%	-95%	Breeding Atlases
Common Swift	B	-27%	n/a	CBS/BBS	-13%	-26%	Breeding Atlases
Skylark	B	-49%	n/a	CBS/BBS	-8%	-14%	Breeding Atlases
Meadow Pipit	B	-59%	n/a	CBS/BBS	+3%	-3%	Breeding Atlases
Grey Wagtail	B	-80%	n/a	CBS/BBS	-6%	-14%	Breeding Atlases
Robin	B	-37%	n/a	CBS/BBS	+2%	+1%	Breeding Atlases
Whinchat	B	n/a	n/a		-64%	-77%	Breeding Atlases
Stonechat	B	-49%	n/a	CBS/BBS	+32%	-5%	Breeding Atlases
Ring Ouzel	B	-86% (11-14y)	n/a	UBS/BWI/IRBBP	-48%	-57%	Breeding Atlases
Mistle Thrush	B	-45%	n/a	CBS/BBS	+4%	-5%	Breeding Atlases

Goldcrest	B	-37%	n/a	CBS/BBS	+8%	+1%	Breeding Atlases
Greenfinch	B	-38%	n/a	CBS/BBS	+14%	+1%	Breeding Atlases
Twite	B	-90% (11-14y)	n/a	McLoughlin pers. comm.	-57%	-80%	Breeding Atlases
Yellowhammer	B	-90% (11-14y)	n/a	IRBBP	-38%	-61%	Breeding Atlases

Sources: Countryside Bird Survey (CBS) / Breeding Bird Survey (BBS), Irish Rare Breeding Birds Panel (IRBBP), Seabird 2000 (Mitchell *et al.* 2004), UBS (Upland Bird Survey 2003, 2004), BirdWatch Ireland (BWI), Wetland Bird Survey (WeBS) / Irish Wetland Bird Survey (I-WeBS) and Breeding Atlases (Sharrock 1976, Gibbons *et al.* 1993 and Balmer *et al.* 2013).

Table 6. Rare breeding and non-breeding species, and localised species. The estimated proportion of the all-Ireland population at the top 10 sites is shown for localised breeding (BL) and wintering (WL) populations. Population estimates refer to individuals or breeding pairs (bp) unless otherwise stated.

Species	Population estimate	Data source	% of all-Ireland population in ten best sites	BOCCI3 Category
Red-throated Diver	< 7 bp	IRBBP		Amber
Great Crested Grebe	1000+ bp	BIE2	86 (WL)	Amber
Black-necked Grebe	< 2 bp	IRBBP		Red
Manx Shearwater	37,178	Seabird 2000	98 (BL)	Amber
European Storm Petrel	99,065	Seabird 2000	87 (BL)	Amber
Leach's Storm Petrel	310	Seabird 2000	100 (BL)	Red
Gannet	32,758	Seabird 2000	100 (BL)	Amber
Cormorant	5,211	Seabird 2000	58 (BL)	Amber
Shag	3,727	Seabird 2000	54 (BL)	Amber
Bewick's Swan	150	BWI	62 (WL)	Red
Whooper Swan	< 10bp / (14,530 wintering)	IRBBP; BWI	40 (WL)	Amber
Greenland White-fronted Goose	11,070	BWI	100 (WL)	Amber
Greylag Goose	4,790	BWI	100 (WL)	Amber
Barnacle Goose	15,370	BWI	100 (WL)	Amber
Brent Goose	36,380	BWI	73 (WL)	Amber
Shelduck	11,760	BWI	83 (WL)	Amber
Wigeon	< 6 bp (annual) (62,980 wintering)	IRBBP; BWI	51 (WL)	Red
Gadwall	< 50 bp (annual) (760 wintering)	IRBBP; BWI	83 (WL)	Amber
Pintail	1+ bp (2007) (1,800 wintering)	IRBBP; BWI IRBBP	100 (WL)	Red Amber
Garganey	< 6 bp (annual)			
Shoveler	< 40 bp (annual) (2,910 wintering)	IRBBP; BWI	88 (WL)	Red
Pochard	< 5 bp (2007-11) (16,030 wintering)	IRBBP; BWI BWI	98 (WL) 100 (WL)	Red Amber
Scaup	(6,300 wintering)			
Eider	(3,550 wintering)	BWI	100 (WL)	Amber
Goldeneye	(6,040 wintering)	BWI	80 (WL)	Red
Common Scoter	39 bp	NPWS		Red
Goosander	< 5 bp	IRBBP		Amber
Red Kite	< 50 bp	GET/NIRSG/RSPB		Amber
White-tailed Eagle	1 bp	GET		Red
Marsh Harrier	1 bp	Scott <i>et al.</i> 2009		Amber
Goshawk	< 20 bp	NIRSG		Amber
Golden Eagle	2 – 3 bp	GET		Red
Quail	1 – 20 bp	RH Coombes pers comm.		Red
Spotted Crake	1 + bp	IRBBP		Amber

Coot	(22,220 wintering)	BWI	96 (WL)	Amber
Oystercatcher	(68,930 wintering)	BWI	53 (WL)	Amber
Little Ringed Plover	1 – 5 bp	IRBBP/Collins 2008		Amber
Grey Plover	(3,050 wintering)	BWI	83 (WL)	Amber
Lapwing	ROI n/a; NI: 860	Colhoun <i>et al.</i> 2013b		Red
Knot	(28,030 wintering)	BWI	95 (WL)	Amber
Dunlin	(56,700 wintering)	BWI	61 (WL)	Red
Black-tailed Godwit	< 3 bp (19010 wintering)	IRBBP; BWI	82 (WL)	Amber
Bar-tailed Godwit	(15,100 wintering)	BWI	81 (WL)	Amber
Curllew	(35,250 wintering)	BWI	34 (WL)	Red
Redshank	(29,520 wintering)	BWI	54 (WL)	Red
Red-necked Phalarope	3 + bp	BWI		Red
Great Skua	5-6 bp	IRBBP		Amber
Mediterranean Gull	20 bp	IRBBP		Amber
Black-headed Gull	1,617	BOCCI2	77 (BL)	Red
Lesser Black-backed Gull	4,849	BOCCI2	61 (BL)	Amber
Sandwich Tern	3,716	BOCCI2	> 88 (BL)	Amber
Roseate Tern	1,330	BWI	100 (BL)	Red
Common Tern	4,189	BOCCI2	> 53 (BL)	Amber
Arctic Tern	3,502	BOCCI2	> 62 (BL)	Amber
Little Tern	346	BOCCI2	100 (BL)	Amber
Guillemot	236,654 bp	BOCCI2	93 (BL)	Amber
Razorbill	51,530 bp	BOCCI2	91 (BL)	Amber
Puffin	21,251 bp	BOCCI2	> 50 (BL)	Amber
Short-eared Owl	<5bps	IRBBP		Amber
Nightjar	< 10 bp	IRBBP		Red
Great Spotted Woodpecker	27-42 bp (ROI)	RH Coombes pers comm.		Amber
Yellow Wagtail	< 5 bp	RH Coombes pers comm.		Amber
Redstart	5 – 15 bp	RH Coombes pers comm.		Amber
Ring Ouzel	< 25 bp	Allan Mee pers comm.		Red
Reed Warbler	65 – 100 bp	IRBBP		Amber
Lesser Whitethroat	1 – 2 bp	IRBBP		Amber
Wood Warbler	< 15 bp	RH Coombes pers comm.		Amber
Pied Flycatcher	< 5 bp	RH Coombes pers comm.		Amber
Twite	54 – 100 bp	McLoughlin 2011		Red

Sources: Birds in Europe II (BIE2); Birds of Conservation Concern 2008-13 (BoCCI2); BirdWatch Ireland (BWI); Irish Rare Breeding Bird Panel (IRBBP); Golden Eagle Trust (GET); Northern Ireland Raptor Study Group (NIRSG); Royal Society for the Protection of Birds (RSPB).

Table 7. Species occurring in internationally important numbers in Ireland during the breeding (B) and non-breeding (NB) seasons. All-Ireland population estimates for species marked * are based on data from 1999-2003; § from Crowe & Holt 2013. European population estimates for waterbirds are from Wetlands International (2012).

Species	Season	All-Ireland population estimate	European population estimate	% European population in Ireland	BoCCI category
European Storm Petrel	B	99,065 *	468,295	22	BI
Roseate Tern	B	1,330	1,849	72	BI
Great Northern Diver	NB	1,338 §	5,000	27	WI
Mute Swan	NB	9,180 §	9,180	100	WI
Whooper Swan	NB	14,530 §	26,500	55	WI
Greenland White-fronted Goose	NB	10,585 §	24,000	44	WI
Barnacle Goose	NB	15,371 §	70,500	22	WI
Light-bellied Brent Goose	NB	36,383 §	40,000	91	WI
Black-tailed Godwit	NB	19,006 §	62,500	30	WI

Discussion

Changes in the Irish Red, Amber and Green lists

This latest assessment of the status of Ireland's birds provides a useful tool to guide future conservation efforts and set key priorities for action on individual species, and species groups. It also allows us to re-examine current priorities and identify knowledge gaps, including where there are data deficiencies. A number of themes emerge from the new Red and Amber lists.

The new Red list includes species whose status is a consequence of threats at a global scale (BirdLife International 2004), thus possibly partly or entirely outside of Ireland. Examples include Velvet Scoter and Balearic Shearwater *Puffinus mauretanicus* whose globally threatened status is a consequence of their rapid population declines. In addition, several species including White-tailed Eagle have come onto the Red list as a consequence of their re-establishment as a breeding species following historical declines.

Previous BoCCI assessments (Newton *et al.* 1999, Lynas *et al.* 2007) identified the declines of breeding waders, especially populations of Curlew and Lapwing (since BoCCI1). BoCCI2 saw the addition of Redshank *Tringa totanus* and Golden Plover, and in this assessment, the status of these species remains unchanged. Woodcock has been added to the Red list on the basis of a long-term range contraction and Dunlin on the basis of short- and long-term declines in the wintering population and a recent breeding range contraction. The decline in Curlew and Lapwing is well documented in Ireland and elsewhere (e.g. NI: Henderson *et al.* 2002), the decline in Curlew being so severe that the species' status was elevated to IUCN near-threatened in 2008. A resurvey of tetrads across Northern Ireland in 2013 has shown declines of 89% and 82% in populations of Lapwing and Curlew respectively since 1987 (Colhoun *et al.* 2013b). Recent research in the UK has demonstrated that Curlew declines are linked with landuse changes in British uplands (chiefly afforestation), with predation the most likely mechanism (Douglas *et al.* 2013). In Ireland, declines in breeding wader populations in lowland grassland areas have been ascribed to drainage and changes in grassland management (Grant *et al.* 1999) whilst afforestation, grazing regimes and predation are likely key factors in upland areas. Wilson *et al.* (2013) have shown the negative effects of proximity to forest edge on breeding Golden Plover and Dunlin, with breeding populations of both species adversely affected by 'edge effects', the effect being strongest within 700m.

Post-war government policy throughout Ireland was to increase the land area under afforestation. In the RoI, the area of peat that was planted on increased from 12% to 71%

between 1956 and 1985 (Wilson *et al.* 2012). This level of afforestation could only have had a profound negative impact on bird communities of otherwise open upland landscapes, both in terms of reducing and fragmenting the area of suitable breeding habitat and allowing refuges for avian and mammalian predators. Red Grouse is a possible indicator species for upland and peatland habitats, preferring open peatland areas with suitable heather cover and heather structure (Watson & Moss 2010). Surveys of Red Grouse in Northern Ireland (Allen *et al.* 2005) and in the Republic of Ireland (Cummins *et al.* 2010), have highlighted the impact that land-use changes in upland habitats have had on a once widespread species with recent population estimates of no more than 2,500 pairs across all-Ireland (Allen *et al.* 2005, Cummins *et al.* 2010). This is half that of previous highest estimates (Gibbons *et al.* 1993), reflecting the huge range contraction highlighted between the first and second breeding atlases (Sharrock 1976, Gibbons *et al.* 1993).

However, changes in populations of Curlew, Dunlin, Golden Plover and Lapwing have not been solely restricted to declines in breeding populations. In this assessment, wintering populations of all four species have shown short (1994-2010) or long-term (1980s-2010) declines of 50% or more which probably reflect the wider declines occurring within breeding populations of these species elsewhere in Europe. Whilst Knot has dropped out of the Red list due to recent increases in wintering numbers, other wintering waterbirds remain on the list. Winter counts of Bewick's Swan, Pintail and Shoveler have all exhibited long-term declines. In the case of Bewick's Swan, there is good evidence that more moderate winter weather conditions in continental Europe combined with supplementary feeding in Britain, are leading to smaller numbers of Bewick's Swans wintering in Ireland (Robinson *et al.* 2004). Pintail and Shoveler have experienced long-term declines across their European ranges (Crowe 2005). Notable newly Red-listed species include a suite of wintering ducks, namely three diving ducks – Goldeneye, Tufted Duck, and Pochard, plus Wigeon. Wintering numbers of the three diving duck species have been falling since the late 1980s (Maclean *et al.* 2006), driven mainly by large declines at Lough Neagh (46-57% declines in mid-winter counts between 1993-2000 and 2002-2009; Tománková *et al.* 2013a). Recent analysis of potential factors causing the declines at Lough Neagh provide evidence of migratory short-stopping (Goldeneye only; Tománková *et al.* 2013a) and coincident changes (-67%) in the density and biomass of benthic food sources available to the ducks between 1997/98 and 2010 (Tománková *et al.* 2013b). A meta-analysis at a European scale suggests that the observed declines at Lough Neagh were rapid climate-driven shifts in the wintering distributions of Tufted Duck and Goldeneye in response to increasingly mild winter temperatures, making waterbodies



Plate 244. Knot – changed from Red to Amber listed. One of only four species with improved status (Colum Clarke).

at northern latitudes more suitable as overwintering sites (Lehikoinen *et al.* 2013).

The Red list includes few relatively uncommon breeding species. Quail, Corncrake, Red-necked Phalarope, Nightjar, Whinchat and Ring Ouzel are relatively scarce breeding species, with fewer than 200 breeding pairs each of Whinchat and Corncrake, and very small numbers (<20 breeding pairs) of the remaining species in most years. Whilst the long-term decline in Corncrake population size and range has been severe (70% loss of breeding range since 1970; 91% decline in population size), numbers have remained relatively stable during the period 2000-2010 (NPWS, unpublished data), probably helped by targeting of agri-environment efforts in key areas in counties Mayo, Donegal and the Shannon Callows. Available population information on the summer migrants, Whinchat and Ring Ouzel, is local or outdated (Cox *et al.* 2002) but suggests that both species are becoming increasingly scarce. The latest breeding bird atlas (Balmer *et al.* 2013) indicates an 80% loss of breeding range for Whinchat since 1968-72, with 35% of this loss occurring since 1988-91 (Gibbons *et al.* 1993, Balmer *et al.* 2013). The main

strongholds for breeding Whinchats in Ireland are now in county Wicklow and the midlands, and there may be as few as 200 pairs remaining across all of Ireland (Alex Copland pers comm.). Progressive agricultural intensification in lowland grasslands has probably led to this species being increasingly restricted to marginal upland areas in Ireland, as has been the case in Britain (Baillie *et al.* 2010), where they may be experiencing a loss of preferred habitat as a result of landuse changes such as afforestation and agricultural intensification or abandonment (Calladine & Bray 2012). Small numbers of Ring Ouzel still occur in Ireland with their distribution limited principally to mountain ranges in counties Donegal and Kerry (Balmer *et al.* 2013). The Red list status of this species is a consequence of a large population decline (>80%) since the 1980s (Lynas *et al.* 2007) with no subsequent recovery (Cummins *et al.* 2003, Hillis 2004). Climate change has been suggested as a causative factor in declines (Beale *et al.* 2006) and the key demographic factor underlying declines as low first-year (and possibly adult) survival, probably associated with habitat quality (Sim *et al.* 2011). Comparable research to that ongoing in the Scottish and Welsh breeding areas (as well

as the Moroccan wintering grounds) is needed in Ireland to establish the specific habitat requirements of the remaining population in their strongholds and understand the causes of the species decline.

Just two of the Red-listed species are rare breeders whose Irish breeding range must be considered at the western or southern edge of their Palearctic breeding ranges: Common Scoter and Red-necked Phalarope. While the latter has recently bred, following some years of absence, the species is Red-listed on the basis of a historical decline. Given its position on the southern edge of the species range and predictions of a progressive distributional shift north and east (Huntley *et al.* 2007), the future status of this species is uncertain. Common Scoter, extinct as a breeding bird in Northern Ireland since 1992 (Gittings 1995), continues to decline in the Republic of Ireland with breeding numbers falling by 63% between the 1980s and 2012 (Hunt *et al.* 2013). The addition of Grey Wagtail and Meadow Pipit to the Red list has been due to short-term (13-year) declines of more than 50% in their breeding populations. The recent declines in these, as well as other resident passerines, have been notable and are coincident with the prolonged cold weather experienced during the winters of 2009/10 and 2010/11 (Crowe *et al.* 2011). The declines shown by these two species in Ireland are larger than those recorded in the UK between 1995 and 2011 (31% and 21% respectively (Risely *et al.* 2013). Over the period of this review a number of species have shown increases in abundance and/or range. Little Egret *Egretta garzetta*, which first bred in Ireland in 1997 (Smiddy & O'Sullivan 1998), has seen its breeding population continue to expand with birds occurring in most counties and breeding recorded for the first time in Northern Ireland in the last few years (Hillis 2012). The range expansion of Buzzards *Buteo buteo* has continued apace with birds now breeding throughout most of the island (Balmer *et al.* 2013). Great Spotted Woodpeckers have recently established and are breeding in a number of counties in Ulster and Leinster, their populations apparently expanding following initial colonisation in counties Down in 2006 and Wicklow in 2009 (R. Coombes pers. comm.). The populations of Blackcap *Sylvia atricapilla*, Grasshopper Warbler and Reed Warbler *Acrocephalus scirpaceus* are showing a continued increase and range expansion since the last BoCCI assessment (CBS/BBS and Balmer *et al.* 2013).

Comparison of the UK BOCC3 Red list (Eaton *et al.* 2009) with that detailed here reveals few similarities. BOCC3 placed 52 species on the Red List of which only 13 species (of the 37 BoCC3 Red-listed species) are common to both UK and Irish lists. Notable differences of species which are not on the UK list include Bewick's Swan, and the diving duck species (Tufted Duck, Pochard and Goldeneye) for which wintering declines in Ireland have been so dramatic. Ireland's more

westerly position on the flyways of these continental migrants means that the effect of migratory short-stopping is most pronounced.

Also absent from the UK list are the range of breeding waders including Curlew, Redshank and Golden Plover which have been in decline in Ireland for some decades. From an Irish perspective, the Red-listing of these species is an essential recognition of their threatened and high priority conservation status on the island.

Notable by their absence from the Irish BoCCI list are Afro-Palearctic migrants, five of which were newly Red-listed in the (UK) BOCC3. Amongst these newly-listed species, only Cuckoo *Cuculus canorus* is widespread in Ireland but the trends in both range (-26% between the first and most recent atlas) and abundance (BBS/CBS trend -23%) are similar to the UK. The Irish population trend narrowly falls outside the Amber-listing threshold.

Data limitations

Our review has used the best available information to determine the status of individual species. The development of long-term monitoring programmes for groups such as wintering waterbirds (WeBS/I-WeBS) and widespread breeding landbirds (BBS/CBS) at an all-Ireland level has improved the reliability of these assessments. Whilst these monitoring programmes have not yet been established for the 25-year period typical of such assessments, they facilitate a much wider and more reliable assessment of avian population status than would otherwise be possible. The availability of data from the latest breeding bird atlas, covering the period 2008-11 (Balmer *et al.* 2013), has proved a timely and valuable addition to the available datasets, especially in assessing range changes. Unfortunately, our understanding of the population trends of a wide range of species not adequately covered by the WeBS/I-WeBS and CBS/BBS schemes, is much poorer with many information gaps.

Some of these information gaps are detailed below and highlight the importance of extending existing monitoring schemes and, in some cases, establishing new ones. Wintering waterbirds which occur in coastal bays or non-estuarine coasts, for example, are inadequately monitored at a national level. Whilst our ability to accurately assess trends in species whose wintering populations mostly occur on non-estuarine coasts (e.g Purple Sandpiper *Calidris maritima*, Ringed Plover, Sanderling *Calidris alba* and Turnstone *Arenaria interpres*) (Colhoun & Newton 2000, Crowe *et al.* 2012) has improved, dedicated monitoring of this assemblage is limited to occasional surveys which have occurred infrequently prior to 1997/98 and at nine-year intervals since. Improved monitoring of these species would require extension of the WeBS/I-WeBS schemes to include annual or periodic



Plate 245. Meadow Pipit – straight from Green to Red listed (M.O'Clery).

monitoring of more non-estuarine habitats. Data deficiencies are even more apparent for waterbirds which occur offshore, including wintering sea-ducks, grebes and divers, all poorly monitored by current surveys (I-WeBS/WeBS).

All-Ireland breeding wader surveys, covering all potential breeding habitats, are now a priority for what is probably the most threatened species group on the new BoCCI list. Whilst periodic surveys have been undertaken in Northern Ireland (Partridge & Smith 1988, 1992, Henderson *et al.* 2002, Colhoun *et al.* 2013b), surveys in the Republic of Ireland have been limited to key areas and/or habitats (e.g. Irish machair, uplands and wet grassland) (Madden *et al.* 1998, 2009, Cox *et al.* 2002, Cummins *et al.* 2003, 2004, Suddaby *et al.* 2009).

Establishing an adequate all-Ireland seabird monitoring programme is a key priority to allow targeted species-specific conservation measures to be implemented. Several seabird populations are of international importance, with significant proportions of the biogeographic populations of Manx Shearwater *Puffinus puffinus*, European Storm Petrel *Hydrobates pelagicus* and Roseate Tern, amongst others, occurring in Ireland (Mitchell *et al.* 2004). There is some

evidence of the effects of reduced food availability on Kittiwake *Rissa tridactyla* productivity at some Irish colonies (Chivers *et al.* 2012) and trends in abundance and breeding success are unknown for much of the population. The lack of a comprehensive survey of seabirds since Seabird 2000 has resulted in our assessment of status change in most species being based on a relatively small proportion of their populations. Given recent widespread declines and low productivity of seabirds in various regions of the North Atlantic (Frederiksen 2010, SNH 2013), including Northern Ireland (Chivers 2008), Scotland (SNH 2013) and Iceland (Vigfusdottir *et al.* 2013), a comprehensive survey of our important seabird colonies is urgently required, updating the data collated by Seabird 2000. A new survey of breeding seabird populations in the UK, provisionally planned for 2016, should also extend to the Republic of Ireland. In addition to these periodic large-scale censuses, a programme of monitoring is required at an all-Ireland level to monitor annual changes in abundance and productivity of the full range of seabird species across a representative sample of sites. Irish waters are also important for passage seabirds, and evaluating the population trends of

species such as Great Shearwater *Puffinus gravis* (Green-listed) and Sooty Shearwater *Puffinus griseus* (Red-listed) poses particular challenges. The impact of long-line fisheries operating within and outwith the Irish Exclusive Economic Zones on species such as Great Shearwater has the potential to have a significant impact on their populations, trends for which are virtually unknown (Anderson *et al.* 2011).

While monitoring of some raptor species is well established through regular national surveys (e.g. Hen Harrier; Ruddock *et al.* 2012 and Peregrine *Falco peregrinus*; Madden *et al.* 2009) and on-going monitoring protocols (e.g. Barn Owl), raptors are, in general, a poorly monitored group. Consequently, there is limited data on population sizes or trends for certain species, which is necessary to adequately determine conservation status and priorities. These species occur at low densities, presenting problems for both conservation and monitoring. With species-specific and resource demanding survey methodologies often necessary, some of which are undergoing development (e.g. Merlin *Falco columbarius*; Fernández-Bellon & Lusby 2011, Lusby *et al.* 2011), designing and implementing an effective protocol for raptor monitoring presents a challenge, but is necessary in order to address gaps in our knowledge of raptor populations in future. Raptors, including Hen Harrier and Merlin, are amongst a group of species which are traditionally surveyed in the UK via the Statutory Conservation Agencies and RSPB Annual Breeding Bird Surveys (SCARABBS). There would be advantages in synchronising UK surveys of such species across the island of Ireland, including ensuring that surveys are completed on a rolling schedule. Kestrel *Falco tinnunculus* and Sparrowhawk populations are monitored through CBS/BBS. However, specific survey work to refine current estimates and trends would be beneficial, whereas effective monitoring of species such as Merlin and Long-eared Owl *Asio otus*, which are not well covered through the existing multi-species surveys, is required.

This review has identified a number of challenges for the future, not least in improving the current lack or irregular monitoring of key species groups. While adequate distribution data may be available at a 10km-level (Balmer *et al.* 2013), information on population size, trends and/or densities is lacking for many species. With Little Egrets now breeding in most counties, a survey of egret colonies and heronries would assist in establishing the current breeding populations of both species. Woodland birds of conservation concern, including Woodcock (Red-listed) for example, are not adequately monitored at an all-Ireland scale. Similarly, for many of our widespread breeding waterbirds including, Moorhen *Gallinula chloropus*, Water Rail *Rallus aquaticus*, Teal *Anas crecca*, Red-breasted Merganser *Mergus serrator* and Kingfisher *Alcedo atthis* information on range and abundance is far from comprehensive.

Future BoCCI assessments

The Red, Amber and Green assessment process is designed to provide a convenient, accessible and easily understood mechanism for understanding the conservation status of birds and identifying where the priorities for conservation action lie. It is important, however, to understand that whilst the BoCCI process plays an important part in determining priorities, it is not the sole determinant of conservation priority-setting. A range of factors need to be considered including, for example, the likelihood of successful outcomes to interventions, or prioritising actions which provide multiple conservation benefits and ecosystem services. Consequently, Red-listed species should not become the automatic priorities for conservation action, but should be considered for intervention by conservation bodies.

This latest review of the conservation status of Ireland's birds continues a tradition established by the Irish Red Data Book in 1993, followed by all-Ireland assessments of species status in 1999 and 2007. Uniquely providing an assessment of the status of Ireland's commonly occurring bird species, BoCCI3 should provide an important source of information for conservation practitioners within the island and therefore be an important tool for priority-setting. We advocate that further reviews continue at approximately six-year intervals and that, in addition to using BoCCI3 to inform conservation action planning, the inadequacies of the process – in particular the data gaps which persist – are addressed to improve future assessments. The skilled contribution of the many volunteers and professionals to the monitoring programmes and surveys utilised in the process is critically important to ongoing efforts to conserve this island's precious avifauna.

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