The Red List of Catalan breeding birds (NE Iberian Peninsula) 2012

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The International Union for Conservation of Nature (IUCN) recommends assessing the conservation status of species at regional level and updating it periodically. In Catalonia, the first evaluation of the threat categories of breeding birds was carried out in 2002. The present article is an update for the period 2002–2012. We applied IUCN criteria, which evaluate the risk of extinction, taking into account population estimates and the distribution of, as well as trends in, the evaluated populations. We also applied guidelines for assessing threat categories at regional level that evaluate the possibilities of rescue by neighbouring populations under the hypothetical case of local extinction. Seventy-four species were considered threatened, i.e. classified as Critically Endangered, Endangered or Vulnerable. These species represent 33% of breeding species in Catalonia. Establishing categories of threat is an important step in determining conservation priorities. However, these priorities should also take into account the status of species at a larger geographical scale, the relative importance of regional populations at global level and the true ability of environmental managers to influence the management of particular species given their habitats and the socioeconomic context.

Key words: threat categories, risk extinction, breeding birds, Catalonia

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The International Union for Conservation of Nature (IUCN) is the world's oldest and largest global environmental organization and their criteria for including plants and animals on Red Lists of Threatened Species are widely recognized as the most comprehensive and objective approach to assessing the conservation categories of species (Butchart *et al.* 2004, 2005). The categories and the criteria of the IUCN Red List were first conceived in 1963 and establish a global standard for the inclusion of species in categories of threat that represent a measure of the risk of extinction of a given species. In 1994, the IUCN Species Survival Commission (SSC) produced a scientifically rigorous approach to assessing extinction risk applicable to all species, which has become a world standard. In 2001, procedures were updated with the publication of the version 3.1 of the IUCN Red List Categories and Criteria (IUCN 2001), reviewed in 2012 (IUCN 2012a).

The use of the Red List at regional and national levels was soon seen to be a good means of highlighting regions with large numbers of endemic and data-deficient species, and of assessing extinction risks at local scales. Consequently, the SSC developed guidelines for the application of Red List Categories at regional level in 1996. The latest revision (Version 4.0) of the guidelines for assessing categories at regional level was published in 2012 (IUCN 2012b). For over 50 years, the Red List has been used worldwide to assess both the global and the local conservation status of plants and animals.

The second edition of version 3.1 of the IUCN Red List Categories and Criteria (IUCN 2012a) states that: "*Re-evaluation of taxa against the criteria should be carried out at appropriate intervals. This is especially important for taxa listed under Near Threatened, Data Deficient and for*

threatened taxa whose status is known or suspected to be deteriorating." As such, the IUCN recommendations do not specify an exact time interval for revaluations. In Catalonia, the first assessment of the threat categories for breeding birds was carried out in 2002 within the framework of the *Catalan Breeding Bird Atlas 1999–2002* (Estrada *et al*. 2004) and concluded that Catalan bird populations are dynamic enough to allow reassessments at intervals of 10 years given the country's small surface area (~32,000 km^2) and its heterogeneous landscape. Currently, we have new baseline information on bird species' population numbers and distributions from the period 2002–2012 with which to analyze changes and review species' threat categories in light of the latest IUCN recommendations for the assessment of categories at regional level. Other countries are also using reviews with similar time periods, e.g. 10 years in Switzerland (Aye *et al.* 2011) or seven years in the UK (Eaton *et al.* 2009).

In the last 10 years no work published for Catalonia on population estimates or on species distribution has taken into account all breeding bird species. The previous assessment of species' conservation status was based on the changes in distributions between the first (Muntaner *et al*. 1984) and the second (Estrada *et al*. 2004) Catalan breeding bird atlases. The data sources currently available for assessing the status of species are more diverse. Some successful monitoring projects implemented in recent years have significant regional coverage but unfortunately do not include all breeding species (e.g. Common Breeding Survey; SOCC). The setting up of the Internet portal www.ornitho.cat in 2009 now allows for the collation of a large amount of non-systematic casual data. In addition, several studies have been conducted on population trends and the distribution of particular species or groups of species, and various active local monitoring programmes are also underway (e.g. waterfowl censuses in the main wetlands). Under this scenario, the present study – in large part, made possible by the work of volunteers and professionals over the last 10 years – updates the conservation status of breeding birds in Catalonia taking the year 2012 as a reference.

Material and Methods

Study area

The study area is defined by the political borders of the autonomous region of Catalonia (NE Iberian Peninsula) (Fig. 1), which has a surface area of c. 32,000 km^2. Its varied relief is characterised by the presence of important mountain ranges on its northern (Pyrenees) and southern (Iberian System) borders, as well as several smaller ranges that follow the coastline in the eastern part of the country. Plains are scarce and usually small, more abundant in the west, and often have continental climates due to their distance from the sea and the presence of geographical barriers. The average altitude of the country is around 700 m, with maximum altitudes in the Pyrenees, where there are ten peaks over 3,000 m and two hundred over 2,000 m. Despite its small area, the country contains two biogeographic regions (Mediterranean and Alpine) and the combination of several geographical factors produces a further remarkable diversity of microhabitats. This implies a high diversity of breeding birds, estimated at 232 species by Estrada *et al.* 2004, 227 of which were evaluated in this study.

Working procedure

The current assessment is based on the application of the categories and criteria set by the IUCN version 3.1 (IUCN 2001, 2012a) and the

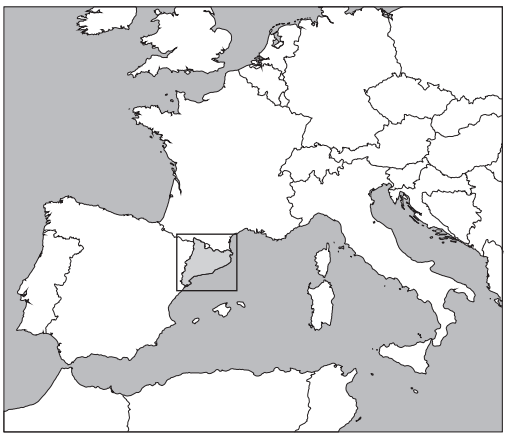

Figure 1. Situation of Catalonia (black rectangle) in Europe.
Situació de Catalunya (rectangle negre) a Europa.

guidelines for its use at regional scale (IUCN 2012b). The categories used are: RE = Regionally Extinct; CR = Critically Endangered; EN = Endangered; VU = Vulnerable; NT = Near Threatened; LC = Least Concern; DD = Data Deficient; NA = Not Applicable; and NE = Not Evaluated. Following the guidelines of IUCN, here we describe briefly the three-step assessment procedure:

1. Designation of the taxa subject to evaluation.
2. An initial allocation of the categories of threat according to the criteria of the second edition of version 3.1 of the IUCN (IUCN 2001, 2012a) considering Catalan populations of species as if they had no contact with external populations.
3. Application of regional corrections corresponding to categories of threat following IUCN guidelines for the use of the red list criteria at regional level (IUCN 2012b).

Species selected for evaluation

We have only included in the threat categories at regional level those species that regularly bred (10 or more years or three generations) in Catalonia between the first sampling year of the first Catalan breeding bird atlas (i.e. 1973; Muntaner *et al.* 1984) and the final year of the current assessment (i.e. 2012). According to this criterion, the following species included in the first assessment (Estrada *et al.* 2004) were not considered in the present study because no confirmed breeding data for the period 1973–2012 exist: Storm Petrel *Hydrobates pelagicus*, Little Crake *Porzana parva*, Rufous Bush Robin *Cercotrichas galactotes*, Pied Flycatcher *Ficedula hypoleuca* and Spanish Sparrow *Passer hispanoliensis*.

In addition, following IUCN recommendations, we did not assess the status of a species if it was included in one of the following three groups: (i) non-regular breeders (less than 10 years or three generations) in the period 1973–2012, which were classified in the category Not Applicable (NA); (ii) exotic species according to the official list of birds of Catalonia (categories ABC, Clavell *et al.* 2006) established in Catalonia, which were also classified in the category Not Applicable (NA); or (iii) species of recent colonization, i.e. those that have been established for less than 10 years or three generations (i.e. after 2002) such as the Marbled Duck *Marmaronetta angustirostris*, which were included in the category Not Evaluated (NE).

IUCN category assignment

Table 1 summarizes the Criteria for the allocation of each species in each Category. Criteria are organized hierarchically and are given in the rows of the table. Codes A, B, C or D in black are the main criteria. They are subdivided into categories 1, 2 or 3, which in turn are subdivided into categories (a), (b) or (c), which then, finally, are subdivided into categories (i), (ii) or (iii). The columns show the quantitative assessment used to determine the different threat categories: Critically endangered (CR), Endangered (EN), Vulnerable (VU) and Near Threatened (NT). If the status of a species does not fall into one these categories, it is assigned to the Least Concern (LC) category.

The IUCN leaves the criteria of quantifying the category Near Threatened (NT) open. In our case, this category has been assessed using the quantitative criteria in the *Libro Rojo de las Aves de España* (Madroño *et al.* 2004) as shown in Table 1.

Following guidelines established by BirdLife International (2000), we have not used criterion E concerning the quantitative analysis of the probability of extinction in the wild since this concept is very difficult to quantify with the available data.

Implementing the IUCN methodology for assessing species' status involves determining to at least some degree of precision geographic ranges and their structures, as well as an estimate of the number of mature individuals and the species' trends in recent years. We checked several sources of information to establish current geographic and demographic parameters of the species assessed (see below), using quantitative values whenever possible or, if not, a qualitative approach.

Demographic parameters

The application of many of the criteria (mainly criteria A, C and D) for assigning a category to each species is based on two aspects: the number of mature individuals and their trend during the period of evaluation. To estimate the number of mature individuals, it was necessary to reassess

Table 1. IUCN categories and criteria used in this evaluation.
Criteris i categories de la UICN utilitzats en la present avaluació.

A. Population size reduction. Population reduction in 10 years or 3 generations				
	Critically Endangered (CR)	**Endangered (EN)**	**Vulnerable (VU)**	**Near Threatened (NT)**
A1	≥ 90%	≥ 70%	≥ 50%	
A2, A3 i A4	≥ 80%	≥ 50%	≥ 30%	≥ 20%
A1. Population reduction observed, estimated, inferred, or suspected in the past where the causes of the reduction are clearly reversible AND understood AND have ceassed. A2. Population reduction observed, estimated, inferred, or suspected in the past where the causes of reduction may not have ceased OR may not be understood OR may not be reversible. A3. Population reduction projected, inferred or suspected to be met in the future (up to a maximum of 100 years) [(a) cannot be used for A3] A4. An observed, estimated, inferred, projected or suspected population reduction where the time period must include both the past and the future (up to a max. Of 100 years in future), and where the causes of reduction may not have ceased OR may not be understood OR may not be reversible.			Based on any of the following:	a) direct observation b) an index of abundance appropriate to the taxon c) a decline in area of occupancy, extent of occurrence and/or habitat quality d) actual or potential levels of exploitation e) effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites..

B. Geographic range in the form of either B1 (extent of occurrence) AND/OR B2 (area of occupancy)			
	Crítically Endangered (CR)	**Endangered (EN)**	**Vulnerable (VU)**
B1. Extent of occurrence	< 100 km^2	< 5.000 km^2	< 20.000 km^2
B2. Area of occupancy	< 10 km^2	< 500 km^2	< 2.000 km^2
AND at least 2 of the following 3 conditions:			
(a) Severely fragmented OR Number of locations	= 1	≤ 5	≤ 10
(b) Continuing decline observed, estimated, inferred or projected in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) area, extent and/or quality of habitat; (iv) number of locations or subpopulations; (v) number of mature individuals			
(c) Extreme fluctuations in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) number of locations or subpopulations; (iv) number of mature individuals			

C. Small population size and decline				
	Crítically Endangered (CR)	**Endangered (EN)**	**Vulnerable (VU)**	**Near Threatened (NT)**
Number of mature individuals	< 250	< 2.500	< 10.000	< 15.000
C1. An observed, estimated or projected continuing decline of at least (up to max. of 100 years in future)	25% in 3 years or 1 generation (whichever is longer)	20% in 5 years or 2 generations (whichever is longer)	10% in 10 years or 3 generations (whichever is longer)	10% in 10 years o 3 generations (whichever is longer)

C2. An observed, estimated, projected or inferred continuing decline AND at least 1 of the following 3 conditions:			
	Crítically Endangered (CR)	**Endangered (EN)**	**Vulnerable (VU)**
(a) (i) Number of mature individuals in each subpopulation	≤ 50	≤ 250	≤ 1.000
(a) (II) % of mature individuals in one subpopulation =	90-100%	95-100%	100%
(b) Extreme fluctuations in the number of mature individuals			

D. Very small or restricted population				
	Critically Endangered (CR)	**Endangered (EN)**	**Vulnerable (VU)**	**Near Threatened (NT)**
D. Number of mature individuals	< 50	< 250	D1. < 1.000	D1. < 1.500
D2. Only applies to the VU and NT categories Restricted area of occupancy or number of locations with a plausible future threat threat that could drive the taxon to CR or EX in a very short time			D2. Area of occupancy < 20 km^2 or number of locations ≤ 5	D2. Number of locations ≤ 8

the estimated breeding population for 2002 (Estrada *et al.* 2004) in the light of the available data for the study period.

The population estimates shown in this study (see column PE in Appendix) correspond to the number of mature individuals. Since most available information on population numbers refers to the number of pairs, we simply doubled these values.

Population estimates shown in the appendix were calculated using five sources of information.

1) Data published between 2002 (reference year for field data for the previous final assessment) and 2012 on population numbers of Catalan populations as, for example, the population estimate of the Wallcreeper *Tichodroma muraria* by Aymerich *et al.* (2012).
2) Estimates based on regular but unpublished censuses, especially those carried out by successive Catalan governments or the managers of the main protected areas. These censuses may cover the totality of the studied territory or only a single breeding locality. We only used this type of census data when, as in the latter case, they correspond to a high proportion of the whole Catalan population (more than 80%).
3) Recalculation of the population estimated by Estrada *et al.* (2004) by applying the annual percentage of change in the trend obtained by the Common Bird Monitoring Programme (SOCC) in 2002–2012 (ICO 2013a) using the programme TRIM (see below).
4) Population estimate published in the *Catalan Winter Bird Atlas 2006–2009* (Herrando *et al.* 2011a). As a general rule, we did not use winter data to avoid the possible effect of unknown movements of individuals during winter, the over-representation of immature individuals, or other particular factors that are associated with this season. However, for a few resident species we did use the most recent estimate of wintering populations provided by Herrando *et al.* (2011a) if they were clearly different from those of Estrada *et al.* (2004) (more than one order of magnitude or more than 50%), or when current knowledge of distribution and densities suggests that the earlier estimation might be less accurate. In these particular cases, the number of mature individuals was calculated as the value of the estimated population in winter divided by three since we assumed that an important part of the population would not recruit in the following breeding season. In addition, when the trend of the SOCC in the period 2002–2012 was significant, it was used to correct the estimate published by Herrando *et al.* (2011a) taking into account 2006 as the first year.
5) Estimates based on casual sightings published in yearbooks and other sources (e.g. www.ornitho.cat).

Estimated population numbers are for 2012, other than for species for which we used information from censuses. In these cases, the estimate corresponds to the most recent available census; the year of reference is specified in the PE column of the Appendix. Long-lived waterbirds (herons, flamingos, waders, gulls, etc.) are an exception to this rule. In this type of species, annual censuses can give abnormally low counts and then recover the following year. This occurs when mature individuals refrain from breeding. The IUCN recommends that these dynamics are not considered as an indication of a fluctuating population (IUCN 2012a). For this reason, we have not treated these species as such and the population estimates used by the assessment correspond to the most recent census year with a number of mature individuals in accordance with the mean number of breeding individuals recorded in previous years.

In order to assess population trends (criteria A and C), we calculated the changes in every

species' populations in 2002–2012 (see column Trend in the Appendix). The calculations of population trends were based on different data and methods. Population trends shown in this study consist of:

1) Trends published between 2002 (reference year for field data for the previous final assessment) and 2012. For some species, the study period was not exactly 2002–2012, but we assumed that the trend could be extrapolated to the whole study period.
2) The slope of a simple linear regression carried out with data of unpublished censuses used for the population estimates (see above).
3) The percentage of change calculated with the results of the SOCC in 2002–2012 (ICO 2013a) using the programme TRIM (Pannekoek & van Strien 2005), which was developed to use the data generated by wildlife monitoring to analyse time series of counts with Poisson regressions. TRIM produces estimates of yearly indices, percentage of change and trends in terms of six categories (steep decline, moderate decline, stable, moderate increase, strong increase and uncertain). For those species in which the trend between 2002 and 2012 was either 'decline' or 'increase' (ICO 2013a), we used the value of the percentage of change as the overall trend value. On the other hand, when the trend derived from monitoring programmes was given as 'uncertain' or 'stable' (ICO 2013a), we considered that there had been no change in the population and the percentage of change was taken to be zero.
4) Assessment based on casual records. In these cases, we did not calculate a precise value for change but instead established a qualitative estimation in order to evaluate whether the species had undergone a change of over 20% in the last 10 years or whether it had remained stable.

When population estimates or temporal trends were calculated using statistical inference, we obtained quantitative results with confidence intervals. In these cases, we always considered the minimum population estimate and the most negative trend estimate as the worst-case scenario. For instance, in the case of the Stone Curlew *Burhinus oedicnemus*, the number of mature individuals was estimated at 2,000–2,600 birds and the population decline at 19–40%. Thus, we assumed a population of 2,000 individuals and a decline of 40%.

Estimates of population numbers and trends were sometimes uncertain due to our analytical process (e.g. SOCC results based on little real data) or to the original data source (e.g. uncertainty specifically indicated in the bibliographic sources). Despite being considerable in some cases, a single value was needed to be able to apply most of the IUCN criteria. The appendix indicates those species for which estimates had a high degree of uncertainty.

Geographic range

The application of many of the criteria when assigning a category to each species (mainly criteria B, but also criteria D2) is based on demographic parameters and also the size and the structure of the geographical range. The assessment of the geographical range requires the analysis of three parameters: extent of occurrence, area of occupancy and number of locations. For the extent of occurrence and area of occupancy, we assessed both the current magnitude and the change suffered during the study period. In our case, we considered the extent of occurrence to be the number of 10x10 km UTM squares in which the species occurs. The area of occupancy was calculated as the occupied surface by species considered with a minimum unit of 2x2 km cells. Since there is no detailed geographical information for most species from before 2002, we did not perform a detailed calculation of both these surface areas, although we did analyse whether or not they were below the threshold of the criteria B1 or B2. The basis for the assessment of the surface area of these two parameters was the *Catalan Breeding Bird Atlas 1999–2002* (Estrada *et al.* 2004). Subsequent corrections of areas were conducted using 1) casual reports in birding yearbooks for Catalonia, local ornithological publications and/or internet resources suggesting a loss or gain in a distribution area; or 2) the opinion of expert ornithologists regarding recent colonisations and/or extinctions.

Then, we compared the changes between data sets in order to apply the sub-criteria (b) = diminution of geographic range or (c) = fluctuation of geographic range for the B1 and B2 criteria. Due to the uncertainty of the assessment of the real extent of occurrence and

area of occupancy, we only show changes in the parameters and express them as distribution changes (column DC of Appendix).

Finally, it was important to know how many breeding locations were within the territory evaluated for the application of the criteria B1(a), B2(a) and D2. The methodology consisted in counting the number of breeding locations if below 10, the maximum threshold used. However, the IUCN criteria are lax in this issue and define a location as "the area affected by a potential threat". We applied this definition in our assessment but we tried to avoid applying this term to large areas due to the impossibility of determining whether a threat is affecting the whole area or not. This is the case of the Lleida Plain, the largest agricultural landscape in Catalonia. This area is of homogeneous relief and climate, but there is a marked heterogeneity in terms of land use. Consequently, local circumstances often hinder any extrapolation of the effects of a particular impact to the whole plain. On the other hand, sometimes we had to consider as a single location a relatively large continuous breeding area, where each population could not be isolated. For instance, in the Pyrenees, we differentiated subpopulations in its eastern and western sectors but did not individualize every massif where a particular species occurs and where a particular impact may be occurring. We also applied the concept of location for colonial waterbird species, which allowed us to define accurately breeding areas that could be considered a unit in terms of the effects of a specific impact. The Ebro Delta, the biggest wetland in the study area, was always considered as a single location because many of the impacts it suffers affect the whole area.

Application of regional corrections

In small territories, a key factor in assessing species' status is the application of regional corrections to the initially assigned categories. Regional corrections assume that the population analysed is not isolated and therefore depends not only on the internal dynamics of the area where the species is being evaluated but also on the whole area where the species occurs. The correction procedure is based on assessing the probability that a population could be re-established by foreign individuals after a hypothetical extinction event. This method involves a short questionnaire with yes-no answers that lead to the applicable correction, which may downlist (i.e. apply a less threatened category to the species), uplist (i.e. apply a more threatened category) or not change the category (Fig. 2).

We considered that a population could receive immigrants able to breed when the immigration of individuals needed to maintain the current population level is known. IUCN guidelines suggest that immigrants have to arrive in sufficient numbers for a rescue to be feasible. In the particular case of species with large populations (more than 20,000 mature

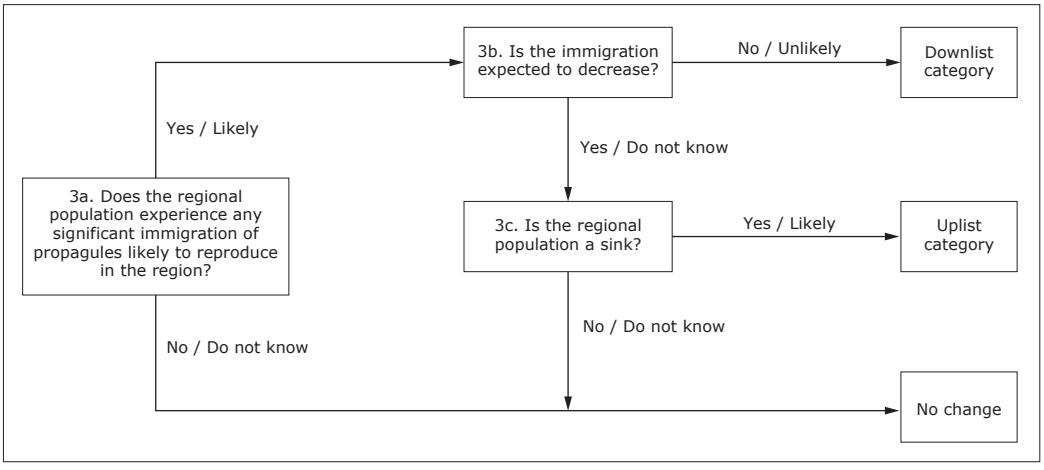

Figure 2. Conceptual scheme for establishing the categories of regional red list.
Esquema conceptual per ajustar les categories de la llista vermella regional.

individuals) in decline that annually receive many migrants during the winter (e.g. Stonechat *Saxicola rubicola*, Chiffchaff *Phylloscopus collybita* and some finches), we assumed that the number of winter visitors that remain in Catalonia in the breeding season is not enough to rescue the current breeding population in Catalonia. For this reason, we answered 'No' to question 3a in Figure 2 and we maintained the initial category of threat in these species.

When the arrival of immigrants was considered to be sufficient to ensure the rescue of the Catalan population (answer 'Yes' to the question 3a in Figure 2), we assessed the conservation status of the neighbouring populations to determine whether or not immigration is expected to decrease (question 3b, Figure 2). The assessment of nearby populations used the current population trends observed in populations in Spain (SEO/BirdLife 2012), France (http://vigienature.mnhn.fr/page/le-suivi-temporel-des-oiseaux-communs-stoc) and Europe (PECBMS 2012, BirdLife International 2004). In addition, we also checked the Spanish (Madroño *et al.* 2004) and French (UICN France *et al.* 2011) red lists, as well as the final evaluation of the EU as a whole (BirdLife International 2004). We assumed that immigration is expected to decrease when the trend in Spain, France or Europe is evaluated as decreasing or when the species was classified by Spanish, French or European Red Lists as Critically Endangered (CR), Endangered (EN) or Vulnerable (VU).

Finally, the answer to the question 3c was 'Yes' only when previous studies demonstrated that the evaluated population is really a sink population. In the case of the species initially assigned to the category Least Concern (LC), the only possible regional correction is to downlist them because the regional population is a sink. In these species, we evaluated this question directly (3c, Fig. 2) but in no case was the answer positive.

Results

The full Red List of Breeding Birds in Catalonia 2012 is given in the Appendix. This new assessment has resulted in the identification of 74 species as threatened at regional scale. Therefore, of the 227 bird species confirmed as breeders in Catalonia over the last 30 years, 33% are threatened (categories CR, EN and VU), 13% are Near Threatened (NT), 47% are Least Concern species (LC), 2% were not evaluated (NE) and 5% were not assessed (NA) (Fig. 3). The application of the regional guidelines resulted in the downlisting of 55 species, 30 of which were classified as Endangered (EN) or Vulnerable (VU), 21 as Near Threatened (NT) and 4 as Least Concern (LC). Only one species, the Bonelli's Eagle *Aquila fasciata* was upgraded, and passed from Endangered (EN) to Critically Endangered (CR). Thus, the regional correction reduces by 11% the total number of threatened species in Catalonia. There is also one Regionally Extinct (RE) breeding species, Dupont's Lark *Chersophilus duponti*, which has not been found in its single breeding location since 2005 (Sales 2006).

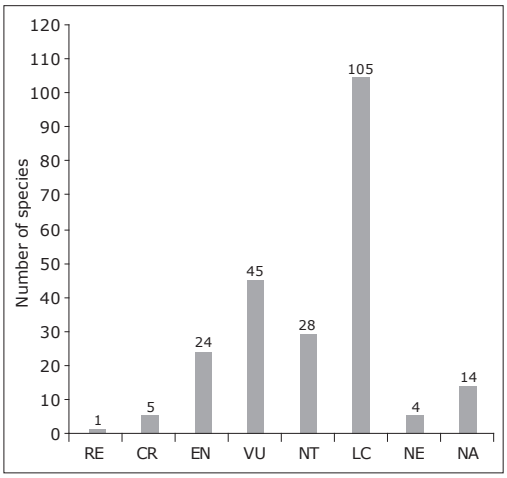

Figure 3. Number of species of breeding birds in Catalonia included in each IUCN threat category in the 2012 evaluation. Categories of threat: RE = Regionally Extinct; CR = Critically Endangered; EN = Endangered; VU = Vulnerable; NT = Near Threatened; LC = Least Concern; NE = Not evaluated; NA = Not applicable.
Nombre d'espècies d'ocells nidificants a Catalunya incloses en cadascuna de les categories d'amenaça de la UICN en l'avaluació realitzada el 2012. Categories d'amenaça: RE = Extint a nivell regional; CR= En perill crític; EN= En perill; VU= Vulnerable; NT= Proper a l'amenaça; LC= Preocupació menor; NE = No avaluada; NA= No aplicable.

Discussion

Status of Catalan avifauna

According to our assessment, one third of the bird species breeding in Catalonia are currently threatened. Although this could be interpreted as a highly deficient conservation status, the true picture is somewhat different (Herrando & Anton 2013). This high percentage of threatened species has to be interpreted in the context of Catalonia as a small country. In fact, the proportion of threatened species is comparable to that of similarly sized nearby countries. For instance, the Red List of breeding birds in Switzerland has 39% of threatened species (Aye *et al.* 2011). In France and Spain, with an area about ten times larger than Catalonia, the percentage of threatened species diminishes to 26% (UICN France *et al.* 2011) and 25% (Madroño *et al.* 2004), respectively. Therefore, the area under study determines greatly the percentage of threatened species probably due to the well-known relationship between population numbers and area size (MacArthur & Wilson 1967).

Five species have a high risk of extinction. The Garganey *Anas querquedula* has an estimated population of 2–10 mature individuals concentrated in a single location and a decline of about 15%. The Catalan population is located at the edge of the world breeding area and, despite the fact that its current IUCN Red List category is Least Concern, its overall population trend is negative (BirdLife 2013a). The Catalan Bonelli's Eagle *Aquila fasciata* population in 2012 consisted of 132 mature individuals distributed mainly in the southern and western parts of the Catalan coastal mountains. Its population in Catalonia is stable but is maintained by the immigration of foreign individuals, i.e. it is a sink population (Hernández-Matías *et al.* 2013). The Black-bellied Sandgrouse *Pterocles orientalis* has a small stable population of 20–30 mature individuals in one or two locations in west-central Catalonia, a small fraction of the population of the Ebro depression that is now stable after a long period of decline due to habitat loss (Estrada *et al.* 2004). The Short-toed Lark *Calandrella brachydactyla* population was calculated in 2012 as having only 48–396 mature individuals after a severe decrease of 82–96% since 2002. This percentage of decline was already detected in 2002 and seems to be related to habitat loss and agricultural intensification (Estrada *et al.* 2004). Finally, the Lesser Grey Shrike *Lanius minor* is probably the most endangered species in Catalonia, with only two mature individuals in a single location despite conservation efforts that include captive breeding and the subsequent releases of juvenile birds.

Selection of the IUCN protocols

The approach proposed by the IUCN for assessing the conservation status of species, at both global and regional levels, is purely scientific and in theory has no legal implications. However, the scientific community has endorsed its use even despite the shortcomings and errors that have been identified (Possingham *et al.* 2002, Miller *et al.* 2007, Mace *et al.* 2008). We believe that this approach may represent a starting point for the legal categorization of species in a territory, as has occurred in many countries. In a survey sent to 180 national focal points designated by governments of the Convention on Biological Diversity, 82% of countries that have developed or will develop a threatened species list have either already incorporated or will do so in the future, respectively, the IUCN criteria into their national conservation strategies (Miller *et al.* 2007). This is the case in nearby countries such as Switzerland or France, where the government commission regularly reviews bird categories according to the IUCN criteria (Aye *et al.* 2011, UICN France *et al.* 2011).

Populations and not species

Catalonia, as in other regions of the Mediterranean basin, is an important area for the reproduction, passage and wintering of Palaearctic birds (Blondel & Aronson 1999). The IUCN guidelines (2012b) state that when there are breeding and visiting species in the same area, assessments of threat categories should be estimated separately for each population. However, we only evaluated breeding populations in Catalonia and so this document is not a full Red List of Birds of Catalonia. The list published in this study should only be applied to the populations occurring during the breeding season. Nevertheless, most of the listed species also have winter and migrant populations that are some-

times more numerous than the breeding ones of the same species. The full Red List of Birds of Catalonia should incorporate information on wintering and migrating birds for which there is extensive information contained in the *Catalan Winter Bird Atlas* (Herrando *et al.* 2011a).

The IUCN categories and conservation priorities at regional level

As recommended by the IUCN, a regional Red List should not be the only criterion used to establish conservation priorities in a particular region. Beyond socio-economic considerations, priorities must also consider the status of species at a larger geographical scale and the relative importance of regional populations in relation to world populations (e.g. Keller & Bollman 2004). IUCN categories of threat applied at a regional level indicate only the probability of species extinction in the geographic area for which the assessment was performed (IUCN 2012b). It is obvious that, from the point of view of conservation on a global scale, the disappearance of a marginal population of a species of wide distribution has less relevance than a substantial decline in the number of individuals in the world's core population. Therefore, categories of threat should be considered only as a first step to determining conservation priorities. For example, in Switzerland, IUCN criteria at national and global scale and the importance of Swiss bird populations related to Europe constitute the basis for determining national bird conservation priorities (Keller & Bolman 2004, Aye *et al.* 2011). In the UK, IUCN categories are used in combination with other objective criteria such as the British and European trends, as well as the importance of the species at national and global scale, to develop multiple lists (green, amber and red) that indicate the level of conservation concern (Eaton *et al.* 2009).

Conservation priorities depend on factors intrinsic to the species but must also take into account the real possibility of influencing a particular species or its habitat via management or conservation actions. Unfortunately, we cannot fight effectively against certain global factors of change (e.g. climate change) with specific conservation policies at local scale. Moreover, the socio-economic context of each moment in each region must be also assessed to determine the most feasible and useful conservation policies. In New Zealand, Joseph *et al.* (2009) designed models that incorporate costs, benefits (including species conservation values) and the likelihood of management success to determine project prioritization protocols for the conservation of threatened species when budgets were limited.

Bearing in mind previous experiences, we believe that this study could represent a valuable tool in the establishment of conservation priorities in Catalonia. However, several other aspects beyond the likelihood of extinction at regional level should also be considered when debating conservation priorities (Keller & Bolman 2004, Eaton *et al.* 2009, Joseph *et al.* 2009). In terms of scientific criteria, the following at least should be borne in mind: 1) the global risk of extinction; 2) the importance of the Catalan population in a global context; 3) the current and predicted scenarios of driving forces such as climate change or changes in land use; and 4) the real possibility for correcting potential impacts on species and habitats. For instance, the comparison of the threat category of two breeding populations classified as Endangered (EN) indicates the need for different conservation priorities. The Northern Shoveler *Anas clypeata* is i) a LC species at global scale (IUCN 2013); ii) the Catalan population represents less than 0.001% of its world population and less than 0.01% of its European population (ICO 2013b); iii) predictions based on climate models forecast its disappearance as a breeding species in the western Mediterranean area (Huntley *et al.* 2007); and iv) the protection of the wetlands where it breeds in Catalonia is already considered to be high. Thus, the Northern Shoveler is not of first-order priority for conservation managers despite its threat category in Catalonia as per IUCN criteria. Instead, the Egyptian Vulture *Neophron pernocpterus* is i) classified as Endangered (EN) at world scale (IUCN 2013); ii) its Catalan population represents 0.4% of the world population and 1.6% of the European population (ICO 2013b); iii) climate models predict its presence in the region at the end of the century (Huntley *et al.* 2007); and iv) its breeding range in Catalonia is not fully protected. Thus, despite the increase in its Catalan population, important efforts are required to contribute to the global conservation of this species. Many arguments

such as these are needed if we are to define the optimum method for determining the priority species to be conserved in Catalonia.

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Resum

La Llista Vermella dels ocells nidificants a Catalunya (NE de la península Ibèrica) 2012

La Unió Internacional per a la Conservació de la Natura (UICN) recomana avaluar l'estat de conservació de les espècies a nivell regional i actualitzar-lo periòdicament. A Catalunya, la primera avaluació de l'estat de conservació dels ocells nidificants es va realitzar l'any 2002. En aquest treball presentem una actualització per al període 2002–2012. S'han utilitzat els criteris de la UICN, que avaluen el risc d'extinció en una regió determinada, tenint en compte el nombre d'individus madurs, la distribució i les tendències de cada espècie avaluada, així com les possibilitats de rescat des de poblacions veïnes en el cas d'una hipotètica extinció local. A l'avaluació, 74 espècies han estat considerades amenaçades (CR, EN i VU). Aquest conjunt representa el 33% de les espècies d'ocells que nidifiquen a Catalunya. L'establiment de les categories d'amenaça és un pas important en la determinació de prioritats de conservació en una regió, encara que per definir aquestes prioritats també s'han de tenir en compte la situació de cada espècie en una escala geogràfica superior, la importància relativa de les poblacions de la regió en relació a les poblacions globals i les possibilitats dels gestors ambientals per influir tant en la gestió de l'espècie com en el seu hàbitat i en el context socioeconòmic.

Resumen

La Lista Roja de las aves nidificantes en Cataluña (NE de la península Ibérica) 2012

La Unión Internacional para la Conservación de la Naturaleza (UICN) recomienda evaluar el estado de conservación de las especies a nivel regional y actualizarlo periódicamente. En Cataluña, la primera evaluación del estado de conservación de las aves nidificantes se realizó en 2002. En este trabajo presentamos una actualización para el período 2002–2012 utilizando los criterios de la UICN, que evalúan el riesgo de extinción en una región determinada. A tal efecto se han tenido en cuenta el número de individuos maduros, la distribución y las tendencias de cada especie evaluada, así como las posibilidades de rescate desde poblaciones vecinas en el caso de una hipotética extinción local. Tras la evaluación, 74 se han considerado amenazadas (CR, EN, VU). Este conjunto representa el 33% de las especies de aves que nidifican en Cataluña. El establecimiento de las categorías de amenaza es un paso importante en la determinación de prioridades de conservación en una región, aunque para definir estas prioridades se han de tener en cuenta la situación de cada especie en una escala geográfica superior, la importancia relativa de las poblaciones de la región en relación a las poblaciones globales y las posibilidades de los gestores ambientales de influir tanto en la gestión de la especie como en su hábitat y en el contexto socioeconómico.

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Appendix

This appendix shows the results of the 2012 evaluation for each confirmed breeding species in Catalonia and is structured to provide a synthetic display with all the necessary information for the inclusion of every taxon in each category. The list consists of the following elements:
Species = Scientific name of the species
Cat = Catalan IUCN threat category. If the category is marked with a º, it means that the category was corrected by regional correction.
Criteria = All the criteria used in the assessment of the threat category (see Table 1).
RC= Regional Correction: ↑ uplist category, ↓ downlist category (see Fig. 2).
PE = Catalan population estimate in 2012 of mature individuals. When the year was not 2012, the figure is given in square brackets. Normally, the estimate is expressed as a range but in some cases data is accurate enough to provide an exact number. Values are enclosed in brackets when the estimate uncertainty is high.
PE DS = Catalan population estimate data source. BA: Catalan breeding bird atlas (Estrada *et al*. 2004); EC: Expert criterion; TC: Total census; PC: Partial census; SOCC: Breeding bird atlas number corrected using the trends in the Catalan Common Breeding Bird Monitoring (SOCC) in 2002–2012; WA: Catalan Atlas of Wintering Birds (Herrando *et al*. 2011a); WSOCC: Wintering bird atlas numbers in winter corrected using the SOCC trend in 2002–2012. If the information was obtained from literature, the reference is provided.
Trend = Temporal trend of the Catalan population in 2002–2012 expressed as a range if the percentage of change is known or with a key if the percentage is unknown. +2: increase over 20%; +1: increase less than 20%; 0: stable or uncertain; -1: decrease less than 20%; -2: decrease over 20%; F: Fluctuating trend. Values are in brackets if the uncertainty is high.
Trend DS = Trend data source. EC: Expert criterion; TC: Total census; PC: Partial census; SOCC: Catalan common breeding bird monitoring.
DC = Distribution change 2002–2012. +2: Increase over 20%; +1: increase less than 20%; 0: no change; -1: decrease less than 20%; -2: decrease over 20%. Values are in brackets if the uncertainty is high.

Aquest appendix mostra els resultats de l'avaluació de les categories de conservació al 2012 per a cada espècie d'ocell amb reproducció comprovada a Catalunya i està dissenyat per donar una visio sintètica de tota la informació necessària per a l'assignació d'una categoria a cada tàxon. La llista consta dels següents elements:
***Species** = Nom científic de l'espècie*
***Cat** = Categoria d'amenaça UICN a Catalunya. Quan la categoria va seguida del símbol º, significa que la categoria s'ha corregit amb una correcció regional.*
***Criteria** = Relació de tots els criteris aplicats per a l'assignació de la categoria d'amenaça (vegeu Taula 1).*
***RC**= Correcció regional: ↑ augmentar la categoria, ↓ disminuir la categoria (vegeu Figura 2).*
***PE** = Estimació poblacional a Catalunya el 2012 expressada en nombre d'individus madurs i seguit per l'any de l'estimació poblacional entre claudàtors quan l'any és diferent a 2012. En general el valor s'expressa com un rang, però en molts casos la dada va ser molt precisa i, aleshores, el valor que es dóna és un sol nombre. Entre parèntesi quan el valor presenta una incertesa alta.*
***PE DS** = Font de dades de l'estimació poblacional a Catalunya. BA: Atles de nidificants (Estrada et al. 2004); EC: Criteri d'expert; TC: Cens total; PC: Cens parcial; SOCC: Atles de nidificants i aplicació de la tendència SOCC entre 2002 i 2012; WA: Atles d'hivern (Herrando* et al. *2011); WSOCC: Atles d'hivern i aplicació de la tendència SOCC entre 2002 i 2012. Quan la font de dades prové d'una consulta bibliogràfica es mostra la referència corresponent.*
***Trend** = Tendència catalana entre 2002 i 2012. S'ha expressat com un rang quan el percentatge de canvi es coneix i com un codi quan el percentatge és desconegut. +2: increment major del 20%; +1: increment menor del 20%; 0: estable o incert; -1: disminució menor del 20%; -2: disminució major del 20%; F: Tendència fluctuant. Entre parèntesis quan el valor presenta una incertesa alta.*
***Trend DS** = Font de dades de la tendència. EC: Criteri d'expert; TC: Cens Total; PC: Cens parcial; SOCC: Tendència SOCC.*
***DC** = Canvi en la distribució 2002-2012. +2: Increment major del 20%; +1: increment menor del 20%; 0: sense canvi; -1: disminució menor del 20%; -2: disminució major del 20%. Entre parèntesis quan el valor presenta una incertesa alta.*

Species	Cat	Criteria	RC	PE	PE DS	Trend	Trend DS	DC
Cygnus olor	NA			20	BA	(0)	EC	(0)
Tadorna tadorna	NTº		↓	536 [2011]	PC	+1	PC	(+1)
Anas strepera	NTº		↓	1,400 [2011]	PC	0	PC	(0)
Anas crecca	NA			<10	BA	0	EC	(0)
Anas platyrhynchos	LC			41,000-62,000	SOCC	+28/+55%	SOCC	(0)
Anas querquedula	CR	D		2-10	EC	(-1)	EC	(0)
Anas clypeata	ENº	D	↓	20-30	BA	(0)	EC	(+1)
Marmaronetta angustirostris	NE			0-4	EC	+2	EC	(+2)
Netta rufina	VU	D2		4,000-5,000	BA	(0)	EC	(+1)
Aythya ferina	VUº	D1	↓	100	EC	+2	EC	+2
Lagopus muta	VU	D1		444-740	BA	(0)	EC	(0)
Tetrao urogallus	VU	A2b. C1. D1		800-940	Fernández-Olalla *et al.* 2012; Robles *et al.* 2006	>30%	Fernández-Olalla *et al.* 2012	(0)
Alectoris rufa	LC			62,00-158,000	SOCC	0	SOCC	(0)
Perdix perdix	VU	D1		560-700	WA	(0)	EC	(0)
Coturnix coturnix	LC			12,000-42,000	BA	F	SOCC	(0)
Phasianus colchicus	NA			(800-1,600)	BA	(0)	SOCC	(0)
Tachybaptus ruficollis	NTº		↓	800-1,000	WA	(0)	EC	(0)
Podiceps cristatus	NTº		↓	260-340	BA	(0)	EC	(0)
Podiceps nigricollis	NA			<10	BA	(0)	EC	(0)
Phalacrocorax carbo	NA			0-4	EC	+2	EC	(+2)
Phalacrocorax aristotelis	VUº	D1	↓	82-84	Álvarez & Velando 2007	+48%	Álvarez & Velando 2007	(0)
Botaurus stellaris	ENº	B2ab. D	↓	2	EC	(0)	EC	(0)
Ixobrychus minutus	LC			2,000	BA	(0)	EC	(0)
Nycticorax nycticorax	LC			1,600-2,000 [2011]	PC	(+1)	EC	(+1)
Ardeola ralloides	NTº		↓	1,400	BA	(0)	EC	(0)
Bubulcus ibis	LCº		↓	10,000-14,000	BA	(0)	EC	(+1)
Egretta garzetta	LCº		↓	3,400-5,000 [2006]	PC	(+1)	PC	(+1)
Egretta alba	ENº	D	↓	22 [2010]	PC	+2	PC	(0)
Ardea cinerea	LCº		↓	1,060-1,140	PC	(+2)	PC	(+1)
Ardea purpurea	VU	D1		800-1,200 [2006]	PC	(-1)	PC	(0)
Ciconia ciconia	NTº		↓	800-1,000	Molina & del Moral 2006	(+2)	Molina & del Moral 2006	(+1)
Plegadis falcinellus	NTº		↓	334 [2010]	TC	+2.200%	TC	(0)
Phoenicopterus roseus	NTº		↓	4,872	TC	+225%	TC	(0)
Pernis apivorus	VUº	D1	↓	78-128	Palomino & Valls 2011	(0)	Palomino & Valls 2011	(0)
Elanus caeruleus	ENº	D	↓	6-40	EC	F	EC	(0)
Milvus migrans	NTº		↓	400-1,000	EC	(+2)	EC	(+1)
Milvus milvus	EN	D		60-80 [2009]	TC	(0)	TC	(0)
Gypaetus barbatus	EN	D		50-60	EC	(+1)	EC	(0)
Neophron percnopterus	EN	D		160-170	TC	(+2)	TC	(+1)
Gyps fulvus	LC			1,878-2,230 [2008]	del Moral 2009a	+2	del Moral 2009a	(+1)

Species	Cat	Criteria	RC	PE	PE DS	Trend	Trend DS	DC
Aegypius monachus	NE			10	TC	+2	TC	(+2)
Circaetus gallicus	NTº		↓	800-1,600	SOCC	+28/+96%	SOCC	(0)
Circus aeruginosus	VUº	D1	↓	180-340	SOCC	+117/+310%	SOCC	(+1)
Circus cyaneus	ENº	D	↓	6	TC	(-1)	TC	(0)
Circus pygargus	VUº	D1	↓	168	TC	(+2)	TC	(0)
Accipiter gentilis	NTº		↓	(1,000-2,000)	SOCC	(0)	SOCC	(0)
Accipiter nisus	LC			(2,000-4,000)	SOCC	(0)	SOCC	(0)
Buteo buteo	LC			3,200-4,600	SOCC	+25/+56%	SOCC	(0)
Aquila pomarina	NA			0-2	Bosch & Meyburg 2012	(+2)	Bosch & Meyburg 2012	(+2)
Aquila chrysaetos	VUº	D1	↓	202-216 [2008]	del Moral 2009b	(+1)	del Moral 2009b	(0)
Aquila pennata	VUº	D1	↓	200-1,000	SOCC	+70/+390%	SOCC	(+1)
Aquila fasciata	CRº	D	↑	132	BA	(0)	EC	(0)
Falco naumanni	VUº	D1	↓	224	TC	(+1)	TC	(0)
Falco tinnunculus	LC			6,000-9,200	BA	0	SOCC	(0)
Falco subbuteo	NTº		↓	(600-1,000)	BA	(0)	SOCC	(0)
Falco peregrinus	NTº		↓	600 [2008]	del Moral & Molina 2009	(+1)	del Moral & Molina 2009	(+1)
Rallus aquaticus	LC			2,000-4,000	BA	(0)	EC	(0)
Porzana pusilla	NA			0-20	EC	(0)	EC	(0)
Gallinula chloropus	LC			26,000-126,000	SOCC	+2/+105%	SOCC	(0)
Porphyrio porphyrio	NT			1,100-1,300	EC	+1	EC	(+1)
Fulica atra	LC			6,000	BA	(0)	EC	(0)
Fulica cristata	NE			2-10	EC	+2	EC	(+2)
Tetrax tetrax	EN	B1ab(v)		862-2,036	TC	-1	TC	(0)
Haematopus ostralegus	VUº	D	↓	68	Palomino & Molina 2009	(0)	Palomino & Molina 2009	(0)
Himantopus himantopus	LC			3,000-10,000	BA	(0)	EC	(0)
Recurvirostra avosetta	VUº	B1ab(v)	↓	614 [2011]	PC	-24%	PC	(0)
Burhinus oedicnemus	VUº	C1	↓	2,000-6,200	SOCC	-19/-40%	SOCC	(0)
Glareola pratincola	EN	D		222 [2011]	PC	+24%	PC	(0)
Charadrius dubius	LC			2,000-2,800	BA	(0)	EC	(0)
Charadrius alexandrinus	LC			3,300-3,700	Montalvo & Figuerola 2006	(0)	Montalvo & Figuerola 2006	(0)
Charadrius morinellus	NA			0	EC	(-1)	EC	(-1)
Vanellus vanellus	NE			10-20	EC	(+1)	EC	(+2)
Scolopax rusticola	VU	D1		400-600	BA	(0)	EC	(0)
Tringa totanus	EN	D		140-200	BA	(0)	EC	(0)
Actitis hypoleucos	EN	D		70-140	BA	(0)	EC	(0)
Chroicocephalus genei	VUº	A2b. B1ab(v)	↓	292 [2011]	TC	-68%	TC	(0)
Chroicocephalus ridibundus	NTº		↓	>9,000	EC	+2	EC	(+1)
Ichthyaetus melanocephalus	ENº	D	↓	20-40	EC	+2	EC	(+2)
Icthyaetus audouinii	VU	D2		25,000 [2011]	PC	0	EC	(+1)
Larus fuscus	ENº	C2a(ii)	↓	150	EC	-1	EC	(+1)

Species	Cat	Criteria	RC	PE	PE DS	Trend	Trend DS	DC
Larus michahellis	LC			36,000-40,000	EC	+2	EC	(+1)
Gelochelidon nilotica	NTº		↓	1,078 [2011]	TC	+19%	TC	(+1)
Sterna bengalensis	NA			0-4	EC	0	EC	0
Sterna sandvicensis	VUº	B1ab(v). C1. C2a(ii)	↓	2,424 [2011]	TC	-43%	TC	(0)
Sterna dougallii	NA			0	EC	0	EC	(0)
Sterna hirundo	VUº	B1ab(v). C1. C2a(ii)	↓	5,322 [2011]	TC	-45%	TC	(0)
Sternula albifrons	EN	B1ab(v)		360 [2011]	PC	-37%	PC	(+1)
Chlidonias hybrida	NTº		↓	2,326 [2011]	TC	0	TC	(0)
Pterocles orientalis	CR	D		20-30	TC	(0)	TC	(0)
Pterocles alchata	EN	D		100-140	TC	(0)	TC	(0)
Columba livia	LC			720,000-1,800,000	WSOCC	0	SOCC	(0)
Columba oenas	LC			(10,000-17,000)	BA	(0)	SOCC	(0)
Columba palumbus	LC			566,000-962,000	SOCC	+42/+56%	SOCC	(0)
Streptopelia decaocto	LC			470,000-1,246,000	WSOCC	+17/+35%	SOCC	(0)
Streptopelia turtur	LC			90,000-140,000	BA	0	SOCC	(0)
Psittacula krameri	NA			(180-300)	BA	(0)	SOCC	(+2)
Myiopsitta monachus	NA			3,000-7,000	BA	+100/+196%	SOCC	(0)
Clamator glandarius	LCº		↓	(1,100-2,000)	BA	(0)	SOCC	(0)
Cuculus canorus	LC			(32,000-50,000)	BA	0	SOCC	(0)
Tyto alba	VU	C1		(4,400-5,400)	BA; Baucells 2010	(-1)	Baucells 2010	(0)
Otus scops	VU	C1		(10,000-14,000)	BA; Baucells 2010	(-1)	Baucells 2010	(0)
Bubo bubo	NT			(1,200-1,400)	BA	(0)	EC	(0)
Athene noctua	LC			(18,000-29,000)	BA	(0)	SOCC	(0)
Strix aluco	LC			(22,000-32,000)	BA; Baucells 2010	(0)	Baucells 2010	(0)
Asio otus	NT			(1,300-1,600)	BA	(0)	EC	(0)
Aegolius funereus	VU	D1		(300)	BA	(0)	EC	(0)
Caprimulgus europaeus	LC			(43,000-56,000)	SEO/BirdLife 2012	(+1)	SEO/BirdLife 2012	(0)
Caprimulgus ruficollis	NT			(12,000-20,000)	SEO/BirdLife 2012	(-1)	SEO/BirdLife 2012	(-1)
Apus melba	LC			(42,000-104,000)	SOCC	+126/+191%	SOCC	(0)
Apus apus	LC			(664,000-1,080,000)	SOCC	+63/+87%	SOCC	(0)
Apus pallidus	LC			(2,400-5,400)	BA	(0)	EC	(0)
Alcedo atthis	LC			(2,000-2,800)	BA	(0)	EC	(0)
Merops apiaster	LC			(62,000-106,000)	SOCC	+45/+79%	SOCC	(+1)
Coracias garrulus	NTº		↓	560-810	Sardà *et al.* 2011	(+1)	Sardà *et al.* 2011	(+1)
Upupa epops	LC			122,000-192,000	BA	0	SOCC	(0)
Jynx torquilla	LC			9,600-14,600	BA	0	SOCC	(0)
Picus viridis	LC			16,000-25,600	SOCC	-8/-18%	SOCC	(0)
Dryocopus martius	VU	D1		(300-1,000)	BA	(0)	SOCC	(+1)

Species	Cat	Criteria	RC	PE	PE DS	Trend	Trend DS	DC
Dendrocopos major	LC			80,000-126,000	WSOCC	+32/+51%	SOCC	(+1)
Dendrocopos medius	VUº	D1	↓	62-104	WA	(+1)	EC	(+1)
Dendrocopos minor	VU	D1		800-2,000	WSOCC	+60/+209%	SOCC	+2
Chersophilus duponti	RE			0	EC	-2	EC	-2
Melanocorypha calandra	LC			8,698-16,804	TC	(0)	EC	0
Calandrella brachydactyla	CR	A2b. C1. D1		48-396	SOCC	-82/-96%	SOCC	-2
Calandrella rufescens	VU	D1		(400-1,000)	BA; WA	(0)	EC	0
Galerida cristata	LC			270,000-668,000	SOCC	+44/+68%	SOCC	0
Galerida theklae	LC			(26,000-84,000)	WA	(0)	SOCC	0
Lullula arborea	LC			162,000-364,000	SOCC	+14/+32%	SOCC	0
Alauda arvensis	LC			66,000-142,000	BA	0	SOCC	0
Riparia riparia	LC			4,000-14,000	EC	F	EC	0
Ptyonoprogne rupestris	LC			34,000-48,000	BA	0	SOCC	0
Hirundo rustica	LC			(370,000-538,000)	BA	(0)	EC	0
Cecropis daurica	NTº		↓	700-2,200	SOCC	+58/+213%	SOCC	+2
Delichon urbicum	LC			(274,000-408,000)	BA	(0)	EC	0
Anthus campestris	LC			(3,200-19,000)	BA	(0)	SOCC	0
Anthus trivialis	VUº	A2b	↓	3,000-19,400	BA	+48/+65%	SOCC	-1
Anthus spinoletta	VU	A2b		(6,400-17,200)	SOCC	-33/-57%	SOCC	-1
Motacilla flava	VUº	A2b	↓	600-1,400	SOCC	-41/-64%	SOCC	0
Motacilla cinerea	VU	A2b. C1		8,600-19,600	SOCC	-25/-45%	SOCC	0
Motacilla alba	LC			78,200-142,000	BA	0	SOCC	0
Cinclus cinclus	LC			(2,000-4,000)	BA; EC	(-1)	EC	-1
Troglodytes troglodytes	LC			628,000-927,000	BA	0	SOCC	0
Prunella modularis	LC			101,000-184,000	BA	0	SOCC	0
Prunella collaris	LC			(3,200-5,600)	BA	(0)	EC	0
Erithacus rubecula	LC			1,557,000-2,169,000	BA	0	SOCC	0
Luscinia megarhynchos	LC			1,784,000-2,598,000	SOCC	+6/+14%	SOCC	0
Phoenicurus ochruros	LC			72,000-140,000	BA	0	SOCC	0
Phoenicurus phoenicurus	VUº	D1	↓	(60-200)	EC	(+2)	EC	+2
Saxicola rubetra	VU	C1		(1,400-2,000)	EC; SOCC	(-1)	EC; SOCC	-1
Saxicola rubicola	VU	A2b		53,400-104,400	SOCC	+29/+39%	SOCC	-1
Oenanthe oenanthe	LC			17,200-44,000	BA	0	SOCC	0
Oenanthe hispanica	LC			(33,000-51,000)	BA	(0)	SOCC	0
Oenanthe leucura	VU	A2c		(420-700)	EC	(-2)	EC	-2
Monticola saxatilis	VU	D1		(1,000-3,000)	BA	(0)	SOCC	0
Monticola solitarius	LC			(8,000-13,000)	BA	(0)	SOCC	0
Turdus torquatus	LC			(3,600-6,000)	BA	(0)	SOCC	0
Turdus merula	LC			1,488,000-1,860,000	BA	0	SOCC	0
Turdus philomelos	LC			74,000-122,000	BA	0	SOCC	0
Turdus viscivorus	LC			128,000-206,000	BA	0	SOCC	0
Cettia cetti	LC			45,000-72,200	SOCC	+16/+33%	SOCC	0
Cisticola juncidis	LC			53,000-140,000	BA	0	SOCC	F

Species	Cat	Criteria	RC	PE	PE DS	Trend	Trend DS	DC
Locustella luscinioides	EN	D		(200-600)	EC	(-2)	EC	0
Acrocephalus melanopogon	EN	D		(100-140)	EC	(-1)	EC	-1
Acrocephalus scirpaceus	LC			(10,000-16,800)	BA	(0)	SOCC	0
Acrocephalus arundinaceus	LC			6,200-15,200	SOCC	+65/+144%	SOCC	+1
Hippolais polyglotta	LC			251,000-602,000	SOCC	+25/+44%	SOCC	0
Sylvia atricapilla	LC			978,000-1,594,000	BA	+14/+26%	SOCC	0
Sylvia borin	LC			(60,000-160,000)	BA	(0)	SOCC	0
Sylvia hortensis	LC			(6,800-56,000)	BA	(0)	SOCC	0
Sylvia communis	LC			(5,000-9,200)	BA	(0)	SOCC	0
Sylvia conspicillata	VU	D1		(500-1,000)	BA	(0)	EC	0
Sylvia undata	LC			40,000-144,000	BA	0	SOCC	0
Sylvia cantillans	LC			390,000-1,272,000	SOCC	+23/+40%	SOCC	+2
Sylvia melanocephala	LC			830,000-1,348,000	SOCC	+10/+22%	SOCC	0
Phylloscopus bonelli	LC			500,000-996,000	SOCC	+36/+52%	SOCC	0
Phylloscopus collybita	VU	A2b		44,000-122,000	SOCC	+35/+44%	SOCC	0
Regulus regulus	LC			(74,000-154,000)	BA	(0)	SOCC	0
Regulus ignicapilla	LC			640,000-1,284,000	SOCC	+20/+34%	SOCC	0
Muscicapa striata	LC			18,000-27,000	BA	0	SOCC	0
Leiothrix lutea	NA			(400-600)	EC	(+1)	EC	+2
Panurus biarmicus	ENº	D	↓	(50-100)	EC	(+2)	EC	-1
Aegithalos caudatus	LC			801,000-1,200,000	WA	0	SOCC	0
Cyanistes caeruleus	LC			1,002,000-1,530,000	SOCC	+7/+16%	SOCC	0
Parus major	LC			1,570,000-2,234,000	SOCC	+4/+11%	SOCC	0
Lophophanes cristatus	LC			288,000-492,000	SOCC	-6/-17%	SOCC	0
Periparus ater	LC			538,000-1,192,000	SOCC	+20/+34%	SOCC	0
Poecile palustris	LC			(6,000-36,000)	BA	(0)	SOCC	0
Sitta europaea	LC			80,000-178,400	WSOCC	+28/+59%	SOCC	+1
Tichodroma muraria	VUº	D1	↓	130-200	Aymerich *et al.* 2012	0	Aymerich *et al.* 2012	0
Certhia familiaris	LC			1,800-3,800	BA	(0)	EC	(0)
Certhia brachydactyla	LC			228,000-403,000	BA	0	SOCC	0
Remiz pendulinus	VUº	A2b	↓	2,700-7,400	SOCC	-26/-52%	SOCC	0
Oriolus oriolus	LC			45,000-70,600	SOCC	+14/+28%	SOCC	0
Lanius collurio	NTº	A2b	↓	22,800-71,000	SOCC	-18/-39%	SOCC	0
Lanius minor	CR	C2a(i)(ii). D		2	TC	-2	TC	-2
Lanius meridionalis	EN	A2b. C1		1,200-2,700	SOCC	-22/-53%	SOCC	-1
Lanius senator	LC			38,000-92,000	BA	0	SOCC	0
Garrulus glandarius	LC			222,000-310,000	BA	0	SOCC	0
Pica pica	LC			206,000-286,000	BA	0	SOCC	0
Pyrrhocorax graculus	EN	A2b. C1		(1,140-2,640)	SOCC	(-27/-54%)	SOCC	-2
Pyrrhocorax pyrrhocorax	LC			17,800-41,200	SOCC	+29/+82%	SOCC	0
Corvus monedula	LC			7,000-18,400	SOCC	+29/+103%	SOCC	-1
Corvus corone	LC			14,600-41,400	SOCC	+35/+62%	SOCC	0

Species	Cat	Criteria	RC	PE	PE DS	Trend	Trend DS	DC
Corvus corax	LC			2,800-3,200	BA	0	SOCC	0
Sturnus vulgaris	LC			690,000-1,196,000	BA	0	SOCC	0
Sturnus unicolor	LC			124,000-198,000	BA	0	SOCC	0
Passer domesticus	NT			4,000,000-6,400,000	SOCC	-15/-22%	SOCC	0
Passer montanus	LC			416,000-662,000	BA	0	SOCC	0
Petronia petronia	LC			24,000-34,000	BA	0	SOCC	0
Montifringilla nivalis	ENº	D	↓	(10-40)	EC	(0)	EC	0
Estrilda astrild	NA			(200-600)	BA	(0)	SOCC	+2
Fringilla coelebs	LC			500,000-738,000	SOCC	+25/+36%	SOCC	0
Serinus serinus	NT			1,068,000-1,682,000	SOCC	-19/-24%	SOCC	0
Serinus citrinella	LC			(29,000-53,000)	SOCC	(0)	SOCC	0
Chloris chloris	VU	A2b		254,000-294,000	SOCC	-23/-31%	SOCC	0
Carduelis carduelis	VU	A2b		532,000-842,000	SOCC	-25/-32%	SOCC	0
Carduelis spinus	VUº	D1	↓	(<200)	BA	(F)	EC	0
Carduelis cannabina	VU	A2b		152,000-328,000	SOCC	-20/-33%	SOCC	0
Loxia curvirostra	NTº		↓	17,400-48,200	SOCC	-13/-34%	SOCC	0
Pyrrhula pyrrhula	EN	A2b		7,520-46,000	SOCC	-38/-58%	SOCC	0
Coccothraustes coccothraustes	NTº		↓	(400-1,000)	EC	(+2)	EC	+2
Emberiza citrinella	LC			(5,600-28,000)	BA	(0)	SOCC	0
Emberiza cirlus	LC			404,000-574,000	BA	0	SOCC	0
Emberiza cia	NT			208,000-522,000	BA	-13/-28%	SOCC	0
Emberiza hortulana	LC			6,000-54,000	BA	0	SOCC	0
Emberiza schoeniclus	EN	D1		(140-260)	Atienza 2006	(0)	Atienza 2006	0
Emberiza calandra	LC			500,000-946,000	SOCC	+34/+49%	SOCC	0