STATUS ASSESSMENT

CRITERIA DEVELOPMENT

Historical background

The aim of this assessment is to identify species of conservation concern on a European scale. In the early 1990s, no objective criteria existed for assessing a species's conservation status at a regional level. When compiling the original *Birds in Europe* (Tucker and Heath 1994, hereafter '*BiE1*'), BirdLife therefore aligned its criteria with the relevant articles of the EU Birds Directive (Box 1) to develop a policy-relevant system by which species were allocated a European threat status (see Appendix 6 for details). Endangered corresponded with Article 4.1(a), Vulnerable with Article 4.1(b), and Rare and Localised with Article 4.1(c), whereas Declining referred to Articles 2 and 4.1(d). Species classified as Secure had a Favourable conservation status, but all others had an Unfavourable conservation status, and were therefore treated as Species of European Conservation Concern (SPECs).

Box 1. Selected provisions of the EU Wild Birds Directive (79/409/EEC).

Article 1 states that the Directive relates to the conservation of all species of wild birds occurring naturally in the European territory of the Member States, and that it applies to birds, their eggs, nests and habitats.

Article 2 requires Member States to take measures to maintain the population of the species referred to in Article 1 at a level that corresponds in particular to ecological, scientific and cultural requirements (while taking account of economic and recreational requirements), or to adapt the population of these species to that level.

Article 4.1 requires Member States to take special habitat conservation measures to ensure the survival and reproduction, in their area of distribution, of species listed on Annex I that are: (a) in danger of extinction; (b) vulnerable to specific changes in their habitats; (c) considered rare, because of small populations or restricted local distribution; or (d) in need of particular attention, owing to the specific nature of their habitat.

In particular, Member States are required to classify the most suitable territories in number and size as special protection areas for the conservation of these species, as well as regularly occurring migratory species (covered by Article 4.2), taking into account their protection requirements in the geographical sea and land area where the Directive applies.

The Directive also states that trends and variations in population levels should be taken into account as a background for evaluations. For details of the species listed on Annex I as of 2004, see Appendix 3.

Incorporating the IUCN Red List Criteria

Since *BiE1* was published, SPEC categories have been used widely in national and regional priority-setting exercises across Europe, and have become well known among conservationists and decision-makers. For the sake of comparison and consistency, it is important to retain as much stability in their structure as possible. However, the SPEC system should also have the flexibility to be adapted over time, particularly in the light of new and potentially beneficial developments. One such development was the publication in 2003 of guidelines for applying the IUCN Red List Criteria at a regional level (IUCN 2003a). At a global level, these criteria are firmly established as a valuable tool for assessing species' relative extinction risk (classifying those with a high risk as Critically Endangered, Endangered or Vulnerable; see Appendix 7), and thereby helping to set priorities for conservation action.

The new guidelines make it possible to assess species' relative extinction risk at a European level, using data from within the region. Initially, the IUCN Red List Criteria are applied to the regional population as specified by IUCN (2001). This preliminary classification may then be adjusted if there are populations outside the region that could affect the species's regional extinction risk (for example, by exerting a 'rescue effect', whereby immigration into the region may prevent local extinction; IUCN 2003a). In these cases, the preliminary threat category is downgraded to a level that more accurately reflects the species's regional extinction risk. All species with a relatively high risk of extinction—at either a global or European level—are clearly of conservation concern. Given the advantages of the IUCN system, and following an extensive consultation process (involving the *BiE2* national coordinators and many others in the BirdLife network), it was concluded that the *BiE1* criteria for Endangered and Vulnerable (see Appendix 6) should be replaced by the IUCN Red List Criteria in *BiE2*.

Reconciling extinction risk and conservation status

The IUCN Red List Criteria classify species solely on the basis of their relative extinction risk (IUCN 2001). However, as discussed above, Unfavourable conservation status has a much broader definition. This is spelt out clearly in Article 1 of the EU Habitats Directive (Box 2), which is currently applied by the European Commission as a working definition of Article 2 of the Birds Directive (CEC 2004).

Box 2. Selected provisions of the EU Habitats Directive (92/43/EEC).

Article 1(i) defines the conservation status of a species as 'the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations in the European territory of the Member States'.

It states that a species's conservation status will be taken as Favourable when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats; and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

No species meeting the IUCN Red List Criteria at a regional level can be considered to have a Favourable conservation status in Europe. To be classified as Vulnerable (the lowest of the three IUCN threatened categories) a species must undergo a reduction in population size of at least 30% over 10 years or three generations (or have a small population or geographic range; see Appendix 7). It is difficult to claim that a species experiencing a decline of this magnitude is maintaining its population, that its range is stable, and that it remains a viable component of its habitat. Crucially, however, this does not mean that the opposite is true: species that are not threatened as defined by the IUCN Red List Criteria do not necessarily have a Favourable conservation status.

Many bird species remain widely distributed in Europe, although their populations and ranges have suffered significant long-term declines, owing mainly to habitat loss or degradation. Typically, these species have declined at a rate that does not exceed 30% over 10 years or three generations, and hence does not trigger IUCN Red List Criterion A. In many cases, these declines continue to the present day, although often at a reduced rate because of the heavy losses already suffered. If the IUCN Red List Criteria alone were used to assess conservation status, then species that are depleted or declining only moderately could move from Unfavourable to Favourable without any genuine improvement in their conservation status (provided that the size of their population or range does not trigger Criteria B, C or D). This is because Criterion A applies a 'moving time window' approach, which considers only the last 10 years or three generations.

Based on the definition of Favourable conservation status in Box 2, it was concluded that the SPEC criteria should continue to highlight species that are depleted or declining moderately as having an Unfavourable conservation status, even though they are not threatened by imminent extinction. IUCN (2001) acknowledges this distinction, stating clearly that although the Red List focuses attention on taxa at the highest risk, it is not the only means of setting conservation priorities. In the context of the EU directives and other international conservation agreements (such as the Bern and Bonn

Conventions; see Appendix 3), it would be misleading to assess conservation status based solely on the IUCN Red List Criteria. This falls short of the guidelines for determining Favourable conservation status, and also risks losing an important function of the term, i.e. steering the implementation of the relevant directives and conventions. Consequently, in *BiE2*, the threat status resulting from a regional application of the IUCN Red List Criteria forms only part of the evidence for assessing species' conservation status.

Interpreting the Near Threatened concept in Europe

According to IUCN (2003b), a species should be classified as Near Threatened if it does not currently qualify for Critically Endangered, Endangered or Vulnerable, but is close to qualifying, or is likely to qualify in the near future. Estimates of range and population size or decline should therefore be 'close' to the thresholds for Vulnerable (see Appendix 7), especially if there is a high degree of uncertainty or the species meets some of the sub-criteria. The crucial point is that Near Threatened is not triggered using quantitative criteria, but in the context of a species's proximity to the thresholds for another category (as well as, for instance, its ecological susceptibility, or the nature of the threats facing it). In other words, there is considerable latitude for interpretation.

Consequently, having decided to apply the IUCN Red List Criteria at a European level, it was agreed that the existing *BiE1* criteria of Rare, Localised and Declining could legitimately be interpreted as an expansion of the IUCN category of Near Threatened, and hence be applied as in *BiE1*. Only two minor amendments were necessary: an adjustment to the Declining criterion (because trend data were collected over 10, rather than 20, years for *BiE2*), and the introduction of the Depleted criterion, to highlight species that have not yet recovered from historical declines (see Box 3).

It was also agreed that all globally Near Threatened species occurring in Europe should be categorised as SPEC 1. This was not the case in *BiE1*, when such species were classified as SPEC 2 or 3. Nevertheless, these species are—by definition—also of global conservation concern, and thus deserve to be ranked alongside those meeting the IUCN Red List Criteria at a global level. This minor revision also ensured consistency with two of the criteria used to identify Important Bird Areas at a global (A1) and European Union (C1) level, which refer to 'sites that regularly hold significant numbers of a globally threatened species, or other species of global conservation concern' (Heath and Evans 2000).

Conclusions regarding the revised criteria

The revised SPEC list presented in this review includes species meeting the IUCN Red List Criteria at a European level, and those meeting the additional 'Near Threatened' criteria derived mainly from *BiE1*. Whilst not at imminent risk of regional extinction, the latter also have an Unfavourable conservation status in Europe, and are hence deserving of special conservation measures. This approach should be regarded as a legitimate interpretation of the Near Threatened concept at European level, taking into account the fact that a species's conservation status depends on more than just its relative extinction risk. Thus, it remains consistent with the definition and interpretation of Favourable conservation status in the EU directives (Boxes 1 and 2) and in other international conventions and agreements.

In summary, the only significant differences between this system and that used in *BiE1* are:

- the reallocation of globally Near Threatened species from SPEC 2 and 3 to SPEC 1, thereby placing all species of global conservation concern in the same category;

Box 3. Classification of European threat status.

Each species is initially assessed against the IUCN Red List Criteria (IUCN 2001) at a European level, and then against the additional criteria derived mainly from *BiE1* (Tucker and Heath 1994). All population size thresholds refer to minimum population estimates. In descending order of threat, a species is evaluated as:

- **Critically Endangered (CR)** if its European population meets any of the IUCN Red List Criteria for Critically Endangered (see Appendix 7). Such species have an Unfavourable conservation status in Europe because they are considered to be facing an extremely high risk of extinction in the wild (IUCN 2001).
- **Endangered (EN)** if its European population meets any of the IUCN Red List Criteria for Endangered (see Appendix 7). Such species have an Unfavourable conservation status in Europe because they are considered to be facing a very high risk of extinction in the wild (IUCN 2001).
- **Vulnerable (VU)** if its European population meets any of the IUCN Red List Criteria for Vulnerable (see Appendix 7). Such species have an Unfavourable conservation status in Europe because they are considered to be facing a high risk of extinction in the wild (IUCN 2001).
- **Declining (D)** if its European population does not meet any IUCN Red List Criteria, but declined by more than 10% over 10 years (i.e. 1990–2000) or three generations, whichever is longer. Such species have an Unfavourable conservation status in Europe because they are unable to maintain their populations and/or natural ranges in the long-term. [*BiE1* classified species as SPECs if the size of their population or range declined between 1970–1990 by **20%** or more in 33–65% of the population (or by 50% or more in 12–24% of the population). Given the shorter time period covered by *BiE2*, an overall decline exceeding **10%** is comparable with this approach.]
- **Rare (R)** if its European population does not meet any IUCN Red List Criteria and is not Declining, but numbers fewer than 10,000 breeding pairs (*or* 20,000 breeding individuals *or* 40,000 wintering individuals[1]), and is not marginal[2] to a larger non-European population. Such species have an Unfavourable conservation status in Europe because the small size of their population renders them more susceptible to accelerated declines as a result of:
  - break-up of social structure;
  - loss of genetic diversity;
  - large-scale population fluctuations and catastrophic chance events;
  - existing or potential exploitation, persecution or disturbance by humans.
- **Depleted (H)** if its European population does not meet any IUCN Red List Criteria and is not Rare or Declining, but has not yet recovered from a moderate or large decline suffered during 1970–1990 (see Appendix 6), which led to its classification as Endangered, Vulnerable or Declining in *BiE1*. Such species have an Unfavourable conservation status in Europe because they have already undergone a population decline of the type that various directives, conventions and agreements intend to prevent, and have not yet recovered.
- **Localised (L)** if its European population does not meet any IUCN Red List Criteria and is not Declining, Rare or Depleted, but is heavily concentrated, with more than 90% of the European population occurring at 10 or fewer sites (as listed in Heath and Evans 2000). Such species have an Unfavourable conservation status in Europe because their dependence on a small number of sites renders them more susceptible to accelerated declines as a result of:
  - large-scale population fluctuations and catastrophic chance events;
  - existing or potential exploitation, persecution or disturbance by humans.
- **Secure (S)** if its European population does not meet any of the criteria listed above. Such species have a Favourable conservation status in Europe.

In addition, a species is considered to be:

- **Data Deficient (DD)** if there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A species in this category may be well studied, and its biology well known, but appropriate data on its abundance and/or distribution in Europe are lacking. Data Deficient is therefore not a category of threat (IUCN 2001).
- **Not Evaluated (NE)** if its European population has not yet been evaluated against the criteria.

[1] Only wintering populations of waterbirds of the families Anatidae, Haematopodidae, Charadriidae and Scolopacidae are considered, because these are typically the species with well-monitored winter populations.

[2] Marginal European populations are those that may experience significant immigration from neighbouring non-European populations (the combined total of which exceed 10,000 pairs), and are thus at a reduced risk of extinction resulting from small population size.

Box 4. Example calculation of overall European population trend.

This example illustrates the steps involved in the trend calculations made for each species, using data for Black-throated Loon *Gavia arctica* (see p. 28). Population and trend data for this species are as follows:

Gavia arctica	2000 breeding population (pairs)			1990–2000 population trend		Back-calculated 1990 breeding population (pairs)	
Country	Minimum	Maximum	Geomean	Direction	Magnitude (%)	'Best-case' (geomean)	'Worst-case' (geomean)
Belarus	15	30	21	Stable	+/- 0–19	21	21
Estonia	5	10	7	Stable	+/- 0–19	7	7
Finland	8,000	10,000	8,944	Increasing	+ 10	8,131	8,131
Latvia	0*	5	2	Declining	- 30–49	3	4
Lithuania	3	5	4	Fluctuating	+/- 30–49	4	4
Norway	2,000	5,000	3,162	Declining	- 0–19	3,162	3,904
Russia	35,000	70,000	49,497	Declining	- 20–29	61,872	69,715
Sweden	5,500	7,000	6,205	Stable	+/- 0–19	6,205	6,205
UK	155	190	172	Increasing	+ 17	147	147
Total (pairs)	50,678	92,240	68,015			79,552	88,137

* Substituted with 1 when calculating geometric mean

1. The upper and lower limits of the 1990–2000 trend estimate from each country were applied to the geomean national population estimate, to back-calculate the most likely minimum and maximum population sizes for 1990. [For national populations that remained stable or fluctuated during 1990–2000, the 2000 geomean population estimate was taken as a reasonable estimate of the 1990 population estimate, i.e. no back-calculation was necessary. National populations whose trend was unknown during 1990–2000 were excluded from calculations, but were taken into account when assessing whether a species's status was provisional or not; see also Box 6.]
   Example The Norwegian population of *G. arctica* declined by 0–19% during 1990–2000, leaving 2,000–5,000 pairs in the year 2000, with a geomean (hereafter just 'mean') of 3,162 pairs. Back-calculating from the mean gave a best-case–worst-case estimate of 3,162–3,904 pairs in 1990.

2. The back-calculated population estimates from each country were summed to give a European best-case–worst-case population estimate for 1990.
   Example *G. arctica* bred in nine European countries during 1990–2000. The sum of the nine national back-calculated population estimates for 1990 was 79,552–88,137 pairs.

3. The mean European population estimate for 2000 was compared to the values obtained in step 2, to calculate the best- and worst-case trend scenarios during 1990–2000.
   Example The mean European population estimate for *G. arctica* in 2000 was 68,015 pairs. Comparison with the values obtained in step 2 indicated that the European population declined by 15–23% during 1990–2000:

   Best-case overall trend scenario during 1990–2000 = (79,552 - 68,015) / 79,552 x 100 = -15%
   Worst-case overall trend scenario during 1990–2000 = (88,137 - 68,015) / 88,137 x 100 = -23%

4. For species with a generation length of 3.3 years or less (i.e. most passerines), the calculations ended here, because 10 years is the appropriate time period for assessing trends against IUCN Red List Criterion A (see Appendix 7). When the species was assessed against the criteria, the worst-case trend obtained in step 3 was compared with the relevant thresholds to determine the species's status. It was also used to allocate each species to one of the verbal trend categories in Box 6.
   Example If *G. arctica* were a short-lived species with a generation length of <3.3 years, the worst-case trend calculated in step 3 (-23%) would not exceed the IUCN Red List Criterion A decline threshold for Vulnerable (≥30%). However, it does exceed 10%, so the species would be evaluated as Declining, with a verbal trend of 'moderate decline'.

5. For species with a generation length exceeding 3.3 years (i.e. most non-passerines), further calculations were required to extrapolate the trend obtained in step 3 to the appropriate three-generation time period (see Box 5) for assessment against IUCN Red List Criterion A (see Appendix 7). This involved first calculating the annual rate of population change during 1990–2000.
   Example *G. arctica* has a generation length of 7 years, so its trend must be assessed over 21 years. Assuming that most species show exponential increases or decreases over time (following IUCN 2003b), the species's annual rate of population change during 1990–2000 (-1.4% to -2.1%) was calculated as follows:

   Annual best-case trend = $(((1 + 0.15)^{1/10}) - 1) \times 100\%$ = 1.4%
   Annual worst-case trend = $(((1 + 0.23)^{1/10}) - 1) \times 100\%$ = 2.1%

6. The annual rate of change was then extrapolated to the appropriate time period.
   Example If *G. arctica* continued to decline at the same annual rate for three generations, then it would have declined overall by between 25% and 36%:

   Overall best-case trend extrapolated to three generations = $(1 - ((1 - 0.014)^{21})) \times 100\%$ = -25%
   Overall worst-case trend extrapolated to three generations = $(1 - ((1 - 0.021)^{21})) \times 100\%$ = -36%

7. When a species with a generation length exceeding 3.3 years was assessed against the criteria, the worst-case trend obtained in step 6 was compared with the relevant thresholds to determine the species's status. It was also used to allocate each species to one of the verbal trend categories in Box 6.
   Example Taking into account the generation length of *G. arctica*, the worst-case trend obtained in step 6 met IUCN Red List Criterion A for Vulnerable, because the decline exceeded 30%. Consequently, the species was evaluated as Vulnerable, and was allocated a verbal trend category of 'large decline'.

Note: *G. arctica* underwent a large decline during 1970–1990, so it is very likely that an overall decline exceeding 30% has taken place over the last three generations. Consequently, the species meets IUCN Red List Criterion A2 (see Appendix 7). However, some other species have generation lengths exceeding 10 or even 20 years (especially certain seabirds; see Appendix 4). Even if such species declined during both 1970–1990 and 1990–2000, it is difficult (without further evidence) to justify extrapolating their recent trends back beyond 1970. In these cases, provided that there was no evidence to suggest that recent trends are likely to change, they were extrapolated into the future to invoke IUCN Red List Criterion A4, which takes into account both past and future trends (see Appendix 7).

- the replacement of the original Endangered and Vulnerable criteria with the IUCN Red List Criteria;
- the introduction of the Depleted criterion, to highlight species that declined significantly during 1970–1990 and have yet to recover (although their declines have slowed or ceased).

By retaining a system that closely mirrors the one applied in *BiE1*, the results of the two assessments can be compared with confidence. This is important, because any changes to a list of species of conservation concern should reflect genuine changes in status (or improved knowledge), rather than changes resulting solely from the application of a different set of criteria. Overall, these revised criteria draw attention to all species of European conservation concern, and ensure that a species is assigned Favourable conservation status only if it can be regarded as Secure in the long term.

DATA ANALYSIS

The starting point for this assessment was the list of 514 species assessed in *BiE1*, taking into account the relevant changes in taxonomy and nomenclature over the last decade (see Appendix 4 for details). Species that breed or winter in Europe only occasionally were not included, as Europe is not within their natural range. Four species that occur regularly in Europe, but on passage only, were not assessed: Sooty Shearwater *Puffinus griseus*, Great Shearwater *Puffinus gravis*, Curlew Sandpiper *Calidris ferruginea* and Slender-billed Curlew *Numenius tenuirostris*. However, the first and last of these are of global conservation concern (BirdLife International 2004; IUCN 2004) and are thus classified automatically as SPEC 1. Consequently, the total number of species whose SPEC status was evaluated was 524 (of a total of 526 occurring regularly in Europe).

For each species, the assessment of European threat status was based on four main parameters:

- minimum European population size (in or around the year 2000)
- minimum European range size
- European population trend during 1970–1990
- European population trend during 1990–2000

Population size

As described in the preceding chapter, all national population size estimates were supplied as ranges with minimum and maximum values. To calculate the minimum European population size, minimum national values were summed. For some analyses, the geometric mean (or 'geomean') European population size was required. This was obtained by calculating the geomean of each national population estimate (substituting minimum estimates of 0 for 1, where necessary), and summing all national geomeans. This method provides a better estimate than simply taking the geomean of the minimum and maximum European population sizes (Hagemeijer and Blair 1997).

Range size

For most species, the size of their European range was derived from the *EBCC Atlas* (Hagemeijer and Blair 1997), which maps the breeding ranges of almost every European species at a resolution of 50-km squares. Nevertheless, the *Atlas* does not cover Greenland, Turkey, Cyprus, the Canary Islands or most of Russia. For species whose ranges include these regions, the figures derived from the *Atlas* were adjusted accordingly, mainly with reference to the maps in del Hoyo *et al.* (1992–2003) and Snow and Perrins (1998). Given the relatively coarse scale of the *Atlas* and the nature of the adjustments made, estimates of range size probably conformed more closely to a species's Extent of Occurrence than to its Area of Occupancy (IUCN 2001). Consequently, range size was generally assessed in relation to IUCN Red List Criterion B1, rather than B2 (see Appendix 7).

1970–1990 population trend

BiE1 identified all species that experienced a moderate or large population decline during 1970–1990. For the purposes of the current review, it was also necessary to determine which species were stable and which increased during 1970–1990. This was done by applying criteria analogous to those used to identify declines in *BiE1* (see Appendix 6 for details). Thus, a species that increased during 1970–1990 by 20% or more in 33–65% of its population, or by 50% or more in 12–24% of its population (where the total size of increasing populations exceeded that of declining populations), was classified as having undergone a *moderate historical increase*. Similarly, a species that increased during 1970–1990 by 20% or more in over 66% of its population, or by 50% or more in over 25% of its population (where the total size of the increasing populations exceeded that of declining populations), was classified as having undergone a *large historical increase*. Species that met neither these criteria, nor those for historical declines, were classified as *historically stable* (or *unknown*, if no historical trend information was available).

1990–2000 population trend

Since *BiE1* was published, continuing improvements in survey and monitoring techniques in many European countries have increased the accuracy of the population trend data available. Although most trend estimates supplied for *BiE2* were still banded ranges (i.e. minimum to maximum), they were generally more precise than in *BiE1*. These improvements allowed the calculation of 'best-case' and 'worst-case' European trend scenarios for each species, using geomean population sizes. A worked example of the methods used to perform these calculations, annotated to explain each step, is provided in Box 4. For some long-lived species, the trends obtained for 1990–2000 were then extrapolated to three generation lengths (see Box 5 for details of the calculation of generation lengths). Taking the worst-case trend scenario (in accordance with the precautionary principle), each species was then allocated a verbal trend category as outlined in Box 6.

Box 5. Calculation of generation length.

IUCN (2001) defines generation length as 'the average age of the parents of the current cohort (i.e. newborn individuals in the population)'. Generation lengths (GL) were calculated using the equation:

$$GL = ((2\text{-}m)/2m) + b$$

where m = mean adult mortality in a stable population and b = mean age at first breeding in a stable population.

For many species, m was not available from the literature (primarily Cramp *et al.* 1977–1994). Thus m was estimated using two proxy life-history variables, mean clutch size (s) and mean age at first breeding (b), using the equation:

$$\ln(m) = -1.096 - 0.4215b + 0.1961s + 0.0229b^2 - 0.0097s^2$$

This equation described 88% of the variance in m for the 149 European bird species for which reliable estimates of m were available.

The generation lengths calculated with this method are given in Appendix 4.

Box 6. Allocation of 1990–2000 trends to verbal categories.

Worst-case trend scenario 1990–2000	1990–2000 trend category
≥30% decline	Large decline
10–29% decline[1]	Moderate decline
0–9% decline[2]	Small decline
<10% decline and <10% increase[2]	Stable
<0–9% increase[2]	Small increase
10–29% increase	Moderate increase
≥30% increase	Large increase
Unknown (insufficient data[3])	Unknown

1 An exception was made in cases where a species occurred (or was heavily concentrated) in a single country, and where that country reported a declining trend of 0–19% for 1990–2000. Allocating such species a 'moderate decline' (on the basis of a worst-case trend of -19%) would have inflated the SPEC list with species that probably declined only slightly overall. It would not have served the purpose of this book to list such species alongside those that underwent genuine moderate declines (≥10%) during 1990–2000. To avoid this, such species were assessed as having undergone a 'small decline'.

2 Species undergoing small declines and small increases were only distinguished from stable populations if both the worst-case and best-case trends were in the same direction. For example, a species with a worst-case trend of -8% and a best-case trend of +7% was classified as 'stable'. However, a species with a worst-case trend of -8% and a best-case trend of -5% was classified as having undergone a 'small decline'.

3 When trend data were available for less than 50% of a species's European population, it was not possible to calculate overall trends with confidence. Such species were allocated an overall trend of 'unknown', and are a clear priority for improved monitoring in the future.

Integrating trend information from 1970–1990 and 1990–2000

Differences in the precision and quality of the data from 1970–1990 and 1990–2000 meant that it would have been difficult to combine them to obtain a single overall trend for 1970–2000. Nevertheless, in the absence of an agreed historical baseline or specific targets for recovery, trends from 1990–2000 were assessed in the context of trends from 1970–1990. Under the Depleted criterion (see Box 3), a species was assigned Unfavourable conservation status if its population underwent a moderate or large decline during 1970–1990 and did not recover fully during 1990–2000. Following the same logic, a species was allocated Favourable conservation status if its population increased during 1970–1990 but then declined during 1990–2000, provided that:

- the extent of the recent decline did not exceed that of the earlier increase;
- the recent decline did not meet any IUCN Red List Criteria.

Allocation of provisional status

IUCN (2003b) stresses that Red List assessments should follow a precautionary approach, rather than an evidentiary one. Nevertheless, the limitations of the data meant that on occasions it was prudent to allocate European threat status categories only provisionally. This was done to highlight the conditional nature of their status, which could plausibly have been different if more complete and/or better quality data had been available. In *BiE1*, provisional status was assigned when more than 50% of a species's population size or trend data were of poor or unknown quality. In the current assessment, a more flexible process was used, which permitted the allocation of provisional status on a case-by-case basis. For most species, the quality of the population size data was not relevant in this process, as their European populations far exceeded the thresholds for Unfavourable conservation status. Although the quality of the population trend data was far more relevant, the most crucial factor was the likelihood of better-quality information subsequently revealing the species's current status to be incorrect. The approach is best illustrated using examples:

1. The Russian trend for Black-throated Loon *Gavia arctica* (p. 28) for 1990–2000 was of poor quality, but—because of the size of the Russian population—it had a large influence on the overall trend. If the extent of the Russian decline was underestimated, the species could have declined by more than 50% over three generations, and thus may qualify as Endangered. Conversely, if the extent of the Russian decline was overestimated, the species could have declined by less than 30% over three generations, and thus may instead qualify as Declining. Consequently, it was prudent to evaluate the species's Vulnerable status as provisional.
2. Common Raven *Corvus corax* underwent a large increase across Europe during 1970–1990, and increased slightly during 1990–2000. Nevertheless, the proportion of its European population with good or medium quality trend data was lower in 1990–2000 (31%) than in 1970–1990 (35%), when its status was only provisionally evaluated as Secure. Given the size of its population and range, and the continuing population increase, it is extremely unlikely that any better-quality information that becomes available will reveal the species's status to be anything other than Secure. Consequently, despite the quality of its population trend data, the species's Secure status is not considered to be provisional.

Assessing overall population trends using only quantitative data (i.e. restricting the analysis to countries with good or medium quality data for each species) would have introduced considerable regional bias to the assessment process. Similarly, it was not deemed appropriate to 'weight' national trends according to the data quality codes supplied by national coordinators. Bird populations in east and south-east Europe, for instance, are relatively poorly known, largely owing to the smaller number of ornithologists in these regions. Nevertheless, population trends of species in these areas may well differ from those in other (potentially better-studied) regions of Europe. Any weighting process would have obscured such trends.

It is important to note that data were not collected on range trends during 1990–2000, and that very little reliable information was available on future population or range trends. Consequently, the vast majority of assessments were based on current population and range sizes, and on recent (1970–2000) population trends. Had more information been available on recent range trends, and on projected population and range trends, it is likely that many more species would have been assessed as having an Unfavourable conservation status. Thus, the results of this assessment should be viewed as conservative.

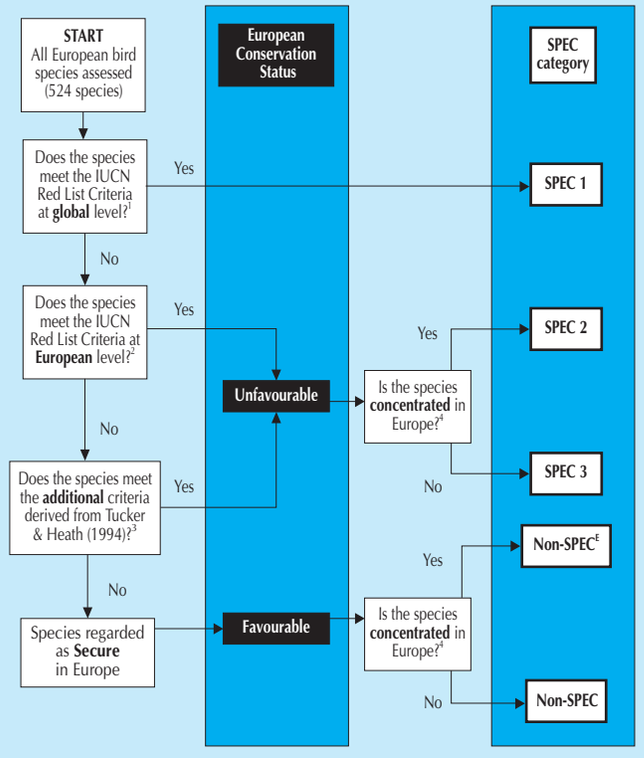
STATUS ASSESSMENT

Having calculated all the parameters described above, each species was assessed against the criteria in Box 3, following the procedure outlined in Figure 1. As in *BiE1*, this resulted in species being classified into one of five categories, depending on their global conservation status, their European threat status and the proportion of their global population or range in Europe (Box 7). The first

Box 7. Categories of Species of European Conservation Concern (SPECs) and Non-SPECs.

- **SPEC 1** European species of global conservation concern, i.e. classified as Critically Endangered, Endangered, Vulnerable, Near Threatened or Data Deficient under the IUCN Red List Criteria at a global level (BirdLife International 2004; IUCN 2004).
- **SPEC 2** Species whose global populations are concentrated in Europe, and which have an Unfavourable conservation status in Europe.
- **SPEC 3** Species whose global populations are not concentrated in Europe, but which have an Unfavourable conservation status in Europe.
- **Non-SPEC^{E}** Species whose global populations are concentrated in Europe, but which have a Favourable conservation status in Europe. [Non-SPEC^{E} corresponds with the SPEC 4 category in *BiE1*. The name of the category has been changed because the species it contains are not SPECs.]
- **Non-SPEC** Species whose global populations are not concentrated in Europe, and which have a Favourable conservation status in Europe.

Figure 1. The procedure for classifying Species of European Conservation Concern (SPECs).



1 Species classified as Critically Endangered, Endangered, Vulnerable, Near Threatened or Data Deficient under the IUCN Red List Criteria at a global level (BirdLife International 2004; IUCN 2004).
2 Species classified as Critically Endangered, Endangered, Vulnerable under the IUCN Red List Criteria at European level, following the guidelines in IUCN (2003a).
3 Species classified as Declining, Rare, Depleted or Localised in Europe, based on the criteria developed by Tucker and Heath (1994).
4 Concentrated in Europe: species with more than 50% of their breeding or wintering population or range in Europe, according to range maps in Cramp *et al.* (1977–1994) or del Hoyo *et al.* (1992–2003), or to global population estimates where available (mostly for waterbirds, in Wetlands International 2002).

three categories together represent Species of European Conservation Concern (SPECs)—species that are either of global conservation concern (SPEC 1) or have an Unfavourable conservation status in Europe (SPEC 2 and 3). A species is considered to have an Unfavourable conservation status if its European population is classified as Critically Endangered, Endangered or Vulnerable under a regional application of the IUCN Red List Criteria, or as Declining, Rare, Depleted or Localised in Europe under the additional criteria derived from *BiE1* (Box 3). All assessments were based on breeding season data, unless a species qualified for a higher category on the basis of winter data.

Integration of breeding and wintering population data

For certain well-monitored waterbirds (i.e. species in the families Anatidae, Haematopodidae, Charadriidae and Scolopacidae), the assessment process was carried out independently on data for both the breeding and wintering populations. Through schemes such as the International Waterbird Census (see "Data collecting" p. 4), the winter populations of many species are monitored more closely than their breeding populations. In many cases, it is easier to census a species when it congregates in winter than when it is dispersed over an extensive (and often remote) breeding area. For some species, however, underlying population trends can be obscured by demographic factors, often related to interannual variation in weather conditions. In some years, for instance, birds that usually winter in Europe may be forced to move elsewhere by harsh winter conditions, whilst in others, birds that usually winter outside Europe may show marked influxes into the region.

Consequently, European threat status and SPEC categories were allocated principally on the basis of breeding data, provided that the resulting category was the same as or higher than that obtained using winter data. For species qualifying as SPECs on both breeding and wintering data, appropriate conservation measures should cover both seasons. However, for species qualifying as SPECs based solely on winter declines, conservation measures on the breeding grounds may be ineffectual if the causes of declines on the wintering grounds are not also addressed. Therefore, if a species qualifies as a SPEC based solely on winter data, this is always clearly indicated.

Use and interpretation of the criteria and categories

In general, conservation priority should be allocated according to SPEC category, with the highest importance given to species of global concern (SPEC 1), especially those threatened with global extinction. Europe has a special responsibility to ensure that the status of these species does not deteriorate within its territory, because any such deterioration would increase their (already relatively high) risk of extinction. However, when setting priorities for action, species' European threat status should also be taken into account. In the light of the limited resources available, this may sometimes involve trade-offs—for example, prioritising action for an Endangered SPEC 2 species above that of a Rare or Depleted SPEC 1 species.

Furthermore, a species's SPEC category and European threat status alone may not necessarily indicate the importance of, or urgency for, conservation actions at the national level. Assessment of this should also take into account: the proportion of a species's global and European population occurring in the country; the status of its national population; the potential for (and cost of) successful action; a species's potential as a 'flagship' to promote conservation; the effects of action on other species; and other logistical, political and strategic considerations.

Consequently, the absence of a species from the SPEC list, or its allocation to a low European threat status, does not in itself justify its exclusion from national conservation actions, or from regional European programmes (e.g. within the European Union). Indeed, the maintenance of regional European and national bird diversities and population levels is highly desirable. On the other hand, recognition as a Species of European Conservation Concern should be seen as additional justification for such conservation measures.

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