## THE N2K GROUP <br> European Economic Interest Group

# Key issues related to the reporting and analysis of Art. 12 population trends <br> Expert Group on Reporting under the Nature Directives 

## Key issues related to the reporting and analysis of Art. 12 population trends

## Introduction

The assessment of the EU population status of birds is currently based heavily on population trends ${ }^{1}$, with the national trends reported by Member States aggregated to estimate the overall EU-level trends for each species. Trend data from Member States is hence crucial for the assessment of EU population status. However, for the 2008-2012 reporting period, Member States reported a surprisingly high number of 'unknown' trends, and during the preparation of Art. 12 reports (and then later in their replies to the Art. 12 questionnaire) Member States also noted several issues related to the reporting of population trends. Based on the experience from the 2008-2012 reporting round and the assessment of the EU population status of birds, population trends were identified as one of the potential issues to be addressed by a dedicated ad hoc group.

This paper outlines some of the key issues related to the reporting and analysis of Art. 12 population trends. It is based on an earlier note prepared for the November 2015 meeting of the Expert Group on Reporting under the Nature Directives ${ }^{2}$, but updated to reflect the key feedback received from Member States therein and in writing following the meeting. These issues should be considered by members of the ad hoc group on Structures and functions, Future prospects and Population trends - plus any other relevant experts with expertise in Art. 12 trends and related monitoring data - with a particular focus on potential areas for improvement of the Explanatory notes \& guidelines (hereafter, simply "guidelines").

## Overview of current situation

For the 2008-2012 reporting round, Art. 12 population and range trends were requested for short-term (12year) and long-term (since c.1980) trend periods, using a combination of a direction category ('stable', 'fluctuating', 'increase', 'decrease' or 'unknown') and quantitative trend magnitudes (i.e. 'minimum' and 'maximum' percentage change). Member States were asked to report trends for the 'ideal' trend periods (i.e. 2001-2012 and 1980-2012), but the reporting format allowed entry of other periods, and the guidelines ${ }^{3}$ indicated there was some flexibility (e.g. if the "best available data" related to surveys in other years). Although some explanation was provided in the guidelines of (the reason for) the category 'fluctuating', no definition or guidance was provided for the other trend direction categories. The guidelines indicated that if a trend direction was reported as 'increase' or 'decrease', trend magnitudes should also be reported (as percentage changes over the relevant period); magnitudes were not requested for 'stable' or 'fluctuating' trends. If the magnitude was available as a "precise figure", the guidelines indicated that it should be entered in both the 'minimum' and 'maximum' fields; if it was a "banded range", e.g. 20-30\%, " 20 " and " 30 " should be entered in the 'minimum' and 'maximum' respectively; if the data were from a "statistically reliable sample scheme", confidence intervals ("often 95\%") should be entered in 'minimum' and 'maximum'.

National data were then used to estimate overall EU-level trends during: 2001-2012 (i.e. the 'short-term' period); 1980-2012 (the 'long-term' period), and; a third period, needed as part of the assessment of species' EU Red List status ${ }^{4}$ (i.e. " 10 years or three generations, whichever is the longer"). This process took into

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account the relative sizes of national populations, based on the geometric mean or 'geomean'5 of the minimum and maximum population sizes reported for these ${ }^{6}$. National populations reported as 'stable' or 'fluctuating' were treated as showing no net change over the relevant trend periods. Any decreases or increases reported for periods that did not exactly match the 'ideal' short- or long-term periods - or indeed the Red List trend period - were extrapolated back and/or forward (or truncated in some cases) to fit the required periods, using the IUCN Red List Criterion A population trend calculator'. 'Worst-case', 'best-case' and 'most-likely' trend scenarios were estimated using the minimum, maximum and average ${ }^{8}$ trend magnitudes reported. Where possible, the final allocation of EUlevel trends to direction categories took into account the potential impact of national trends reported as 'unknown' (based on the relative size of the population and any other indications of likely trend). EU-level trends for species for which over 50\% of the population (based on national geomeans) had trends reported as 'unknown' were also categorised as 'Unknown' overall.

## 'Unknown' trends

A surprisingly high proportion of national trends were reported as 'unknown' in 2013, including c.17\% of short-term and $c .24 \%$ of long-term breeding population trends'. In theory, each of these 'unknown' trends could in practice represent anything between a c.99\% decline ${ }^{10}$ and a $>100 \%$ increase, which - depending on the relative size of the national population - could add considerable uncertainty when it came to estimating the overall EU-level trend.

In some cases, there really will be no information - quantitative or qualitative - on the national trend of a species, in which case use of the 'unknown' trend direction category will indeed be necessary. However, even in these instances, national experts will often have a sense of more likely trend scenarios - or at least of the plausible 'limits' of any potential increase or decrease ${ }^{11}$ - and any indication of these could be extremely helpful when carrying out the EU-level population status assessments.

The proposal is hence to update the guidelines to discourage the use of the 'unknown' trend direction category unless absolutely necessary, and to encourage the provision of supplementary information on plausible trend scenarios - based on expert judgement or any other appropriate sources - where possible ${ }^{12}$. Suggestions for other ways of reducing the uncertainty implicit in 'unknown' trends, without undermining the scientific credibility of national reports, are also welcome.

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## 'Fluctuating' trends

A surprisingly large number of national trends were reported as 'fluctuating' in 2013 - e.g. at least 315 (c.6\%) short-term breeding population trends (of $>190$ taxa) and at least 197 (c.19\%) short-term wintering population trends (of $>95$ taxa) - including for species for which there was no obvious ecological reason for interannual variations on the scale intended to be captured by this category ${ }^{13}$.

In at least some of these cases, the category 'fluctuating' had seemingly been used for species for which the trend from the national common bird monitoring scheme was categorised by TRIM ${ }^{14}$ as "Uncertain", based on the absence of a significant increase or decrease, but broader confidence intervals than are permitted for inclusion in the TRIM category "Stable" ${ }^{15}$. These examples ${ }^{16}$ will now be captured by the new population trend direction category 'uncertain' ${ }^{17}$, which was proposed, discussed and accepted at the November 2015 meeting of the Expert Group on Reporting under the Nature Directives.

For the remaining cases, a tentative proposal was made to encourage reporting of the magnitude of 'fluctuating' trends (as already done by some Member States in 2013) ${ }^{18}$, to help identify those populations undergoing more extreme fluctuations ${ }^{19}$, but concerns were raised regarding the difficulty in measuring the magnitude of fluctuations. Instead, the revised proposal is to amend the guidelines to improve the guidance on under what circumstances the trend category 'fluctuating' should and should not be used - potentially incorporating a suggested minimum 'threshold' for the magnitude of interannual variations ${ }^{20}$. In this context, Member States are encouraged to consider the range of population fluctuations that occur (and are measurable) nationally, and which of these it might be useful/interesting to highlight using the 'fluctuating' category ${ }^{21}$.

## 'Stable' vs increasing/decreasing trends

At present, the guidelines do not provide any definition of the trend direction categories 'stable', 'decrease' or 'increase', or any guidance on when slight increases and decreases should be categorised as such, or reported as 'stable'. The data from the 2008-2012 reporting cycle showed there was considerable variation among Member States in the proportion of species reported in the different trend direction categories, and although some of this variation undoubtedly related to differing national circumstances (both in terms of the underlying trends themselves and the data available on them nationally), there were clearly also differences in Member State interpretation of the categories ${ }^{22}$.

[^2]As it was not possible to enter a ' + ' or ' - ' sign in the trend magnitude fields in the reporting tool (with the direction of trends hence only indicated by the 'increase' or 'decrease' category), any quantitative data available on the confidence intervals of statistically non-significant trends could only be reported in the relevant 'Additional information' text field ${ }^{23}$. In practice (partly for simplicity ${ }^{24}$ ), all national trends reported as 'stable' were treated as showing no net change overall when estimating the EU-level trend, so the effective loss of any uncertainty implicit in 'stable' trends reported without additional comments was perhaps not too problematic. Nevertheless, it was somewhat inconsistent with the approach suggested for increasing and decreasing trends (where reporting of confidence intervals, "often 95\%", was encouraged if data came from "a complete survey and/or exhaustive and statistically reliable sample scheme" ${ }^{25}$ ).

The proposal is to update the guidelines to clarify what figures should be reported in the 'minimum', 'maximum' and/or [new] 'best estimate' trend magnitude fields in different situations, but Member States are also encouraged to suggest other ways in which the guidelines could be amended to improve consistency (e.g. recommended 'thresholds' for trends categorised as 'stable' based primarily on expert opinion ${ }^{26}$, and/or criteria for the categorisation of trends as 'stable' vs increasing or decreasing when statistically robust monitoring data are available ${ }^{27}$ ).

## Extrapolation/truncation of national trends

Trends are only really informative if they relate to a defined time period ${ }^{28}$. If trends from different countries are to be aggregated, or trends for different species compared, the time periods over which they are reported/presented must be comparable ${ }^{29}$. The two principal ways in which this is usually achieved are either to report trends as (average) annual changes, or to report them for a specific time period. For Art. 12 reporting, the latter approach was taken, with national trends sought, and EU-level trends estimated/presented, for the 'ideal' short- and long-term trend periods of 2001-2012 and 1980-2012 respectively ${ }^{30}$.

In practice, relatively few national trends were reported for the exact time periods requested. In the case of breeding season trends, for example, just $c .33 \%$ of short-term trends reported ${ }^{31}$ related to the period 2001-2012, with start-years ranging between 1987 and 2011, end-years ranging between 1999 and 2013, and an average trend period of 12.2 years (range: $2-23$ years; $n=4554$ species reports). In the case of longterm breeding trends, $c .55 \%$ of trends reported ${ }^{32}$ were for the period 1980-2012, with start years ranging between 1969 and 2009, end-years ranging between 1985 and 2013, and an average trend period of 30.2 years (range: $4-42$ years; $n=4120$ species reports).

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As can be seen from the above, the majority of national trends required some manipulation (extrapolation or truncation) before they could be combined in order to estimate species' overall EU trends over the short- and long-term periods. Furthermore, assessment of species' EU Red List status ${ }^{33}$ also involved the estimation of trends over a third period (varying according to the species's generation length), which only coincided with the 'ideal' short-term (12-year) and long-term (33-year) periods in a minority of cases. In most cases, this extrapolation or truncation was carried out using the IUCN Red List Criterion A population trend calculator ${ }^{34}$, which assumes a constant exponential rate of population change. This tool performed satisfactorily when making relatively short extrapolations/truncations ${ }^{35}$ and when the rate of increase or decrease was relatively low (e.g. Figures 1a and 1b), but in instances where the trend reported was fairly pronounced (e.g. a rapid increase or decline), and/or the extrapolation/truncation covered several years, the tool sometimes produced rather extreme (and implausible) results (e.g. Figure 1c), which could have a disproportionate impact on the overall EU trend.

To avoid the scenarios outlined above, a proposal was made to encourage Member States to extrapolate available data to the 'ideal' trend periods, based on their expert knowledge of the situation nationally ${ }^{36}$ (and not 'one-size-fits-all' assumptions, made by those assessing the EU population status). Although at least one Member States indicated their support for this approach, most of those that expressed an opinion indicated that they were uncomfortable doing so.

With the above in mind, the revised proposal is to update the guidelines to encourage Member States to report trends for the 'ideal' short- and long-term periods wherever possible, but where this is not feasible to encourage the reporting of trends using the most 'extrapolatable' data - e.g. averaged or smoothed trends, rather than 'raw' trends based on changes in sample-survey monitoring scheme indices from a start and end year (which can also be affected by factors such as 'atypical' years, e.g. for weather conditions and/or food availability, and random chance effects, especially if sample sizes are small; Figure 2) - along with as much relevant supplementary information as possible (in the 'Additional information' text field ${ }^{37}$ ).

## Long-term trend period

For the 2008-2012 reporting round, the guidelines stated that the 'ideal' period for reporting long-term trends was "from c. 1980 (when the Birds Directive was adopted/entered into force) until c. 2012"38, with an additional note suggesting that "Member States lacking [monitoring] data from before 2000 could consult the two editions of 'Birds in Europe', which present banded national trends ${ }^{39}$ for every species between 1970-1990 and 1990-2000". This differed from the approach taken for reporting under Art. 17 of the Habitats Directive (which was adopted in 1992), where the long-term trend period was 24 years (four reporting cycles).

[^4]Across all Art. 12 breeding-season reports provided in 2013 (including those for which the trend direction category was reported as 'unknown' or left blank), c.73\% of long-term trends were reported for a period starting in 1980, and c.83\% of trend periods started between 1975 and 1985 ( $c .5 \%$ of reports were submitted with the long-term trend period left blank). Just $9 \%$ of long-term trends were reported for a period starting in 1989 (i.e. 24 years prior to 2012) or later. When focusing on national trends providing information that was useful for the EU population status assessments (i.e. by moving the c.25\% of trends reported as 'unknown' or left blank to their own category), c.53\% of long-term trends were reported for a period starting in 1980, c.64\% started during 1975-1985, and c.9\% started in 1989 or later (see Figure 3). In $c .6 \%$ of cases ${ }^{40}$, a long-term increase or decrease was reported without any accompanying trend magnitude information, but over half of these related to just one Member State. Overall, all but one Member States reporting in 2013 provided multiple usable ${ }^{41}$ long-term trends starting in 1980 (or earlier) and ending in 2011, 2012 or 2013 (average: 97 species reports per Member State; range: 11-251; total of 2414 breedingseason reports containing long-term trends meeting the above criteria).

During discussions regarding the revision of the Art. 12 reporting format, a proposal was made (subsequently supported by a number of other Member States ${ }^{42}$, see Appendix 1) to change the long-term trend period to a 24-year moving window, rather than one 'anchored' in 1980. The justification for this proposed change included: i) harmonisation with reporting under Art. 17 of the Habitats Directive; ii) comparability of long-term trends between Art. 12 reporting cycles (as the length of the period remains fixed); iii) availability of relevant monitoring data, and; iv) the fact that only a minority of current Member States were members of the EEC/EU in 1980.

Although the arguments raised by Member States against a 1980 baseline are to be considered, the proposal for a 24-year moving window has certain strategic implications - relating to assessment of the overall effectiveness of the Directive and the issue of 'shifting baselines', for example - which fall beyond the scope of the current paper but which Member States should be aware of. Nevertheless, if the primary purpose of asking Member States to report detailed information on their native bird populations remains to provide the data necessary for the EU-level bird population status assessments, it seems premature to 'harmonise' the data sought in Art. 12 reports with Art. 17 reports if the two assessment processes are not also 'harmonised'.

Art. 12 reports do not include any assessment of current status in relation to national (or biogeographic) Favourable Reference Values, nor do any such values currently exist at the EU level. Contrary to what has been implied elsewhere, a 1980 'baseline' for species' EU population size was not (and, in many cases, could not be) estimated directly based on the national data provided in Art. 12 reports. Instead, a datadriven assessment was made of the likelihood of any population declines since 1980 exceeding 20\% (the threshold agreed for the EU population status categories 'Declining' and 'Depleted'), based on the longterm trend data reported by Member States (plus other key sources of information, where it was clear that these had been overlooked). A similar approach was taken for rapid population declines, i.e. of $30 \%$ or more over three generations, when assessing the EU Red List status (the first step in the EU population status assessments) of longer-lived species.

[^5]The proposed shortening of the long-term trend period to 24 years would hence have a number of important implications for the 'fitness-for-purpose' of the data provided by Member States for the EU population status assessments. Related to this, Member States are invited to provide feedback on the following related questions:

- Would the time periods for assessment of the EU population status categories 'Declining' and 'Depleted' be shortened to match a 24 -year 'long-term' period, and should the $20 \%$ threshold remain the same?
- If so, how would changes from the previous assessments be taken into account when assessing progress towards Target 1(ii) for birds under the EU's biodiversity strategy for 2020?
- If not, would there be instances where the 'long-term' data reported by Member States (for 19952018) could be extrapolated back to 1980 and, if not, what other sources of information should be used to assess qualification for the categories 'Declining' and 'Depleted'?
- How would the previous question apply to assessment of declines for the $c .27 \%$ of (longer-lived) species for which the Red List trend period of "three generations" exceeds 24 years ${ }^{43}$ ?
- Would a 24 -year period be retained for future reporting cycles even when it becomes shorter than the average and median period for which Member States have been part of the EU (or since the Directive was adopted, for those that were already members in 1979) ${ }^{44}$ ?

[^6]Figure 1: Examples (good and bad) of extrapolation/truncation of reported data using the IUCN Red List Criterion A population trend calculator.

a) Population size reported for 2010 (from national survey) and short-term trend (increase of 21\%) reported for 19982010 (i.e. since earlier survey). Trend for 2001-2012 estimated as increase of c.19\%.

b) Population size reported for 2011 (most recent estimate) and short-term trend (decrease of 26\%) reported for 2002-2011. Trend for 2001-2012 estimated as decrease of $c .31 \%$.

c) Population size reported for 2012 and short-term trend reported as decrease of 53\% between 2007 and 2012 (based on data from recently established monitoring scheme). Trend for 2001-2012 estimated as decrease of $c .81 \%$, but resulting population size estimate for 2001 many times larger than last reported estimate (from 2000).

Figure 2: Annual population indices for a species covered by national common bird monitoring scheme illustrating disproportionate impact of 'atypical’ start or end years on raw trends.


In this example, annual indices were available from the national common bird monitoring scheme for every year between 1998 and 2012, but the short-term trend reported by the Member State was an increase of $75 \%$ over the period 1998-2012. When this was truncated (using the IUCN Red List Criterion A population trend calculator) to the 'ideal' short-term period, the estimated trend for 2001-2012 was an increase of $c .55 \%$, which clearly overestimated the real change over this period (based on the population indices in 2001 [140] and 2012 [175] the increase was in practice $25 \%$ ). In this particular case, the Member State could have reported a short-term trend for 2001-2012 using their national monitoring data (and hence there would have been no need for extrapolation/truncation). Nevertheless, had the Member State estimated the trend for (the non-'ideal' trend period of) 1998-2012 based on the average annual trend (reported elsewhere as $+3.3 \%$ per annum; i.e. an increase of $c .57 \%$ over the whole period), the truncated estimate for 2001-2012 (c.43\%) would have been closer to the true change ( $25 \%$ ) than the estimate based on the 'raw' trend calculated from the indices in 1998 and 2012 (i.e. c.55\%).

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Figure 3: Start and end years of long-term breeding population trends reported in 2013 ( $n=5477$ reports).


## Appendix I

## Summary of MS comments on sections of documents post-EGR (20160315), pre-NADEG (20160419) and post-NADEG (20160613) related to Trends

| Trends |  |
| :--- | :--- |
| BE | No paper or other preparatory document received. <br> Please see the input of myselves and colleagues delivered during the preparatory process for the 2013 reporting. <br> Since trend estimation is the main element in the status assessment we all hope to have a large enough time <br> span for reflections on coming papers and proposals. |
| CZ | Czechia supports the DE proposal: long term period as rolling 24-year window in Art 12 report. CZ supports the <br> diminishing of inconsistencies between Art 12 and Art 17 reporting formats in general. |
| DE |  <br> breeding range trend): We strongly support a change of the long term trend to a 24 years period (moving <br> window) instead of a fixed date 1980." <br> This DE proposal on a moving 24 year window (period) for long-term trend in Art.12 reporting was strongly <br> rejected by Bird Life International (EGR 15.03.2016, Top 4a, Introduction to revised Art. 12 and Art. 17 reporting <br> formats, p. 5). The main reasons given by BirdLife were: <br> 1. Past decline and depleted populations would not be covered/ detected <br> $2 . \quad$ Decline may be too short/ slow in short-lived species to be detected in a 24 year time window <br> The rationale given by BirdLife International suggests that the German proposal was misinterpreted. <br> On the EGR meeting it was agreed to re-discuss the time period of the long-term trend and keep the discussion <br> open and referred to the next ad hoc working group on Structures and Functions, where trends are included in <br> the TOR. At the same time the Commission asked with the deadline 15.04 .2016 for comments on "comments on <br> other documents tabled for the EGR meeting including habitat for the species, population units, introduction to <br> the checklist and trends" (reminder e-mail 12.04 .2016$) . ~ T h e r e f o r e ~ w e ~ s e n d ~ a n ~ d i s c u s s i o n ~ n o t e, ~ w h i c h ~ m a y ~ b e ~$ |
| taken into account directly or help to clarify the situation. |  |

DE-proposal is still to change the long term trends in Art. 12 reporting to a 24 -year moving window The main reasons are:

- Direct comparability to the Art. 17 reports and other species trends (harmonization of reporting)
- long-term trends can be compared between subsequent bird reports (not possible with increased time window from report to report)
- long-term and short-term trends can be analyzed ecologically because of their harmonization to comparable trend periods
- Increased availability of reliable monitoring data; improvements in national and international bird monitoring programs can be utilized fully; even for the Art. 12 report in 2019 most of MS will be able to report reliable 24 -year trends based on monitoring programs (http://www.ebcc.info/pecbm.html)
- Synergies with other instruments of bird monitoring \& reporting
- Only a minority of the current MS have been part of the EU, when the Birds Directive 1979 was adopted
- Several MS supported the German proposal (PL, ES, FI, SK), not a single MS was against this proposal

Explanation on the issues of BirdLife:
For Art. 12 reporting MS do only report population data and trends (Short and long term trend), in contrast to Art. 17 reporting no assessment of conservation status is reported by MS. At EU-level the EU Red List of Birds serves as the basis to assess birds and achieve a result in the EU-State of Nature report and for the EU biodiversity strategy targets 2020.

The Assessment Matrix of the Habitats Directive correctly uses two independent assessment principles: quantitative decline and comparison with Favourable Reference Values (here FRP for species). This clearly also covers depleted species with now (almost) stable trends and they will show up as unfavourable (bad).
For Birds formally no FRPs exist. The EU Red List and the procedures developed by BirdLife International to some extent replace the assessment procedure. When the 1980 population size would be inferred from the 2013 birds report or reported once by the member states, these data could be used directly as surrogate for FRPs and serve directly as a baseline for assessments.
Germany did not intend to interfere or change any procedure in the EU bird assessment by BirdLife and thinks

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|  | that these principles can be maintained. However, 24 year long-term trend data would be an additional ecological and conservation-related information. A 24 year trend period (mooving window) for long-term trend guarantees very meaningful information both at EU and MS level and help inter-comparability of trends between species and between both Directives. The 24 year trends (moving time window) can be easily compared with 12 year trends to show, that the achievements of EU and MS as well show significant improvements between long- and short-term trends. The "baseline" 1980 population size still could be used for EU-level assessments. |
| :---: | :---: |
| ES | For those species that have monitoring schemes running from many years, such as common reproductive birds, that are monitored regularly each year with a precise methodology, and with lots of effort from many specialist and/or volunteers in order to get scientifically robust and precise data on magnitude trends from their baseline period to current data, it is a real shame that this robustness and reliability of the magnitude data is lost if the trend period (when field data were taken) is to be extrapolated to whatever period suits to standardize all reports from the rest of the countries. A solution could be not trying to standardize trends to a fixed period, but to give a wider flexibility to the limits of the period, so that both, the short and long term trend period of the report could accommodate a wider range of real trend data corresponding to the period when data were taken in the field. |
| HR | Croatia do not agree with the 1980 fixed baseline, and instead we support the 24 year rolling window (19942018) for reporting about long term trends of bird populations. We agree with German colleagues' explanation on this issue (sent to EC by email on April 15th). |
| HU | HU supports the trends given not for structure and functions but for the area of habitat. <br> Trend magnitude in all cases: We still keep our opinion that trend magnitudes (short term and long term for all fields) should be optional, especially the short term, because it is in practice not feasible to give percentage figures for a 12-year period, the change is not detectable within a short period in every case, only the direction of trends can be given. In case the COM would like to have some information on trend magnitude, we should consider either a wide interval of percentage or other units than percentage. <br> We support that the MSs should be informed and consulted when the COM would like to change the status of an optional field to mandatory, because it can cause a significant amount of reporting burden and it is not easy to adapt to a new requirement within the monitoring schemes. Now the distinction between the two types of optional fields (future mandatory, not that important for the Com.) cannot be seen. |
| NL | NL agrees on the long term trend since 1980, because it is the most policy relevant period, even for later acceded Member States. The rolling window of 24 years has the risk of losing the insight in earlier declines in the population. It is possible that a small increase in the recent past does not compensate the larger loss in the time before. In case of the 24 years rolling window this will result in a positive trend, although the trend since 1980 will still be negative. |
| PL | This field has not been specified yet. However we suggest to use 24 years rolling window to calculate long term trend, as for art. 17 Reporting format. The quality of data collected in 1980' is generally poor, so taking 1980'as a starting point for long term trends calculations will have an influence on the quality of data in this and subsequent reporting rounds. |
| SE | The following is our suggestion for most crucial topics to discuss (in most need of time at the meeting). This is not to say that all other issues can be taken completely off the agenda, of course. - Moving window for long term trend (Art 12) |


[^0]:    ${ }^{1}$ Although trends in distribution/range are also relevant, in practice, data on population trends are generally more available and/or reliable, and often also more 'responsive' to change than trends in spatial parameters.
    ${ }^{2}$ https://circabc.europa.eu/sd/a/271029eb-7410-4729-918c-
    259fcf18400b/4.d\%20Scoping\%20note\%20on\%20reporting\%20of\%20Art\%2012\%20trends.pdf
    ${ }^{3}$ N2K Group (2011) Assessment and reporting under Article 12 of the Birds Directive. Explanatory notes \& guidelines for the period 2008-2012. Final version. (https://circabc.europa.eu/sd/a/4fc954f6-61e3-4a0b-8450ca54e5e4dd53/Art.12\%20guidelines\%20final\%20Dec\%2011.pdf).
    ${ }^{4}$ The initial step in the process agreed with Member States for the EU population status assessment for birds; see: https://circabc.europa.eu/sd/a/4b101339-6e13-4379-ada5-400e5d1ec8ac/Point\%203\%20-\%20Background-Paper\%2021\%20Nov\%202013\%20.pdf.

[^1]:    ${ }^{5}$ The geomean provides a 'cautious' (i.e. lower than the arithmetic mean) estimate of the 'true' population size, reflecting the degree of uncertainty implied by the difference between the minimum and maximum estimates.
    ${ }^{6}$ Or a 'best estimate', if this was provided (e.g. in the relevant 'Additional information' field).
    ${ }^{7}$ Available to download from http://www.iucnredlist.org/technical-documents/red-list-documents (see "Red List Assessment Tools").
    ${ }^{8}$ Or a 'best estimate', if this was provided (e.g. in the relevant 'Additional information' field).
    ${ }^{9}$ In addition, for a further $c .3 \%$ of short-term and $c .6 \%$ of long-term breeding population trends, an 'increase' or 'decrease' trend direction category was reported without any estimate of trend magnitude. Although this obviously provided more information than the 'unknown' trend direction category, some of the discussion that follows could also apply to this scenario.
    ${ }^{10}$ Assuming that the population size reported confirmed that the species in question hadn't gone extinct nationally.
    ${ }^{11}$ In cases where a national Red List of birds has been carried out, the categorisation of a species as nationally 'Least Concern', for example, implies that the species was not believed to have declined by more than $30 \%$ (the threshold for the Red List category 'Vulnerable' under criterion A) over the preceding 10 years or three generations, whichever is longer, or by more than $10 \%$ (the threshold for 'Vulnerable' under criterion C) over the same period for species with national populations of fewer than 10,000 mature individuals.
    ${ }^{12}$ E.g. a note in the relevant 'Additional information' field along the lines of "No reliable information available on trend, but not believed to have decreased or increased by more than $30 \%$ over the ideal trend period".

[^2]:    ${ }^{13}$ The guidelines ( $p .18$ ) mentioned interannual variations of "one or two orders of magnitude", and the IUCN (2001) definition of "extreme fluctuations" (which can be a factor under certain Red List criteria) refer to variations "greater than one order of magnitude (i.e. a tenfold increase or decrease)".
    ${ }^{14}$ 'TRends and Indices for Monitoring data'; the freeware program used by many common bird monitoring schemes to analyse national survey data (see http://www.ebcc.info/trim.html).
    ${ }^{15}$ See http://www.ebcc.info/index.php?ID=590\#Box\%20Trend\%20interpretation\%20and\%20classification
    ${ }^{16}$ Which can often relate to small sample sizes and stochastic variation during surveys as much as true changes in the population between years.
    ${ }^{17}$ Which differs from the existing category 'unknown', as it indicates that some data or qualitative information on the species's national trend do exist, but they are (currently) unclear or equivocal.
    ${ }^{18}$ See note prepared for the November 2015 meeting of the Expert Group on Reporting under the Nature Directives.
    ${ }^{19}$ And hence potentially at greater risk of local extinction than populations with lower levels of variability.
    ${ }^{20}$ For example, changes in the population of $\geq 50 \%$ from year-to-year?
    ${ }^{21}$ Bearing in mind that, as the category implies no clear overall increase or decrease, 'fluctuating' populations were treated as showing no net change over the relevant trend period during the EU population status assessments.
    ${ }^{22}$ For example, at the November 2015 meeting of the Expert Group on Reporting under the Nature Directives, at least two Member States indicated that they had used 'thresholds' for population changes of $\pm 10 \%$ and $\pm 20 \%$ respectively to distinguish 'stable' from increasing or decreasing trends.

[^3]:    ${ }^{23}$ E.g. "Short-term trend [from national common bird monitoring scheme] (2000-2012) was $-0.4 \%$ ( $95 \% \mathrm{CI}:-1.1 \%$ \& $+0.4 \%$ ) per year, so change for whole period was $-5 \%$ ( $95 \%$ CI: $-13 \%$ and $+5 \%$ ), so reported as 'Stable'".
    ${ }^{24}$ It was not feasible to consider all potential combinations of national trend scenarios when estimating the overall EU-level trends for the EU population status assessments.
    ${ }^{25}$ See p. 18 of the Explanatory notes \& guidelines for the period 2008-2012 (link to online PDF in footnote 3).
    ${ }^{26}$ E.g. likely change of $\leq 10 \%$ for short-term and $\leq 20 \%$ for long-term trends?
    ${ }^{27}$ E.g. if $95 \%$ confidence intervals span zero, report as 'stable' (or 'uncertain'; see previous section); if $95 \%$ confidence intervals both fall the same side of zero, report as 'increase' / 'decrease'?
    ${ }^{28} \mathrm{~A} 5 \%$ decline over 30 years is clearly different to a $5 \%$ decline per year.
    ${ }^{29}$ In the case of the former, the relative sizes of national populations also need to be taken into account (a 10\% increase in a country with a population of 100 birds clearly does not 'cancel out' a $10 \%$ decrease in a country with a population of 10000 birds).
    ${ }^{30}$ Although, as noted under 'Overview of current situation', there was some flexibility, depending on data availability.
    ${ }^{31}$ Excluding those reported as 'unknown' or left blank.
    ${ }^{32}$ As above, excluding trends reported as 'unknown' or left blank.

[^4]:    ${ }^{33}$ An integral part of the EU population status assessment process; see footnote 4.
    ${ }^{34}$ See footnote 7.
    ${ }^{35}$ E.g. of one to three years either way.
    ${ }^{36}$ See note prepared for the November 2015 meeting of the Expert Group on Reporting under the Nature Directives.
    ${ }^{37}$ E.g. "No quantitative data available before [\#\#\#\#] (when monitoring scheme started), but trend during [\#\#\#\#][\#\#\#\#] believed to be [trend direction category] and population size in [\#\#\#\#] estimated at around [\#\# \#\#\#] pairs."
    ${ }^{38}$ As noted in the 2014 paper on the EU population status assessment for birds (see link to PDF in footnote 4): "1980 is a policy-relevant baseline, approximating to when the Birds Directive was adopted (1979) and entered into force (1981), rather than an ecological baseline. Thus, it does not adequately capture the pre-1980 declines of many species, whose deterioration stimulated the development of the Directive (and other MEAs - e.g. Ramsar Convention, Convention on Migratory Species, Bern Convention). Given the difficulty of establishing an ecological baseline for many species in most countries, however, using 1980 as the baseline is a pragmatic solution."
    ${ }^{39}$ Mainly for breeding populations, but in some cases (also) for wintering populations.

[^5]:    ${ }^{40} 345$ of 5477 breeding-season reports.
    ${ }^{41}$ i.e. not 'unknown', and including trend magnitudes where relevant
    ${ }^{42}$ But opposed by at least one Member State.

[^6]:    ${ }^{43}$ E.g. up until what point could 'long-term' trend data reported for 1995-2018 be extrapolated backwards, and what sources of information should be used to assess trends before this point for the longest-lived species?
    ${ }^{44}$ Which will range between six and 40 years in 2019, with an average of 25.6 years and a median of 24 years.

