Baltic Marine Environment Protection Commission

Working Group on the State of the Environment and Nature Conservation

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STATE & CONSERVATION 15-2021

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Background

State & Conservation 14-2021 invited JWGBIRD to outline how baselines and threshold values are identified and established for the indicators under the umbrella of its work. This document contains the respective description of the indicator assessing the status of wintering waterbird species by the help of abundance and includes an extension of the indicator to offshore marine areas. The indicator serves the MSFD criterion D1C2.

The document below provides a template filled by indicator leads to provide an overview of progress to STATE & CONSERVATION 15-2021. Key aspects such as methodologies, spatial extent changes, assessment scales and threshold values are presented, identifying ongoing work and other relevant issues towards HOLAS III. This process builds on the prior review of indicator development carried out under STATE & CONSERVATION 14-2021 (summarised in document 4J-16 Rev.1, and detailed within numerous documents under agenda item 4J). The focus of these development works is the completion of indicator development and adjustment work for HOLAS III by the end of 2021, as previously agreed under HOD 57-2019 (document 4-20, Outcomes paragraph 4.51).

The aspect of threshold values in particular is a key issue as threshold value approval will be carried out at HOD 61-2021, with these same templates being submitted to HOD at the same stage as submission to State and Conservation 15-2021 (to allow for the longer national processes required that culminate in approval at HOD).

The document below addresses a single indicator and as well as the generic 'action requests' relating to endorsement of the proposed application in HOLAS III (and the threshold values proposals, where relevant), specific additional requests or statements are also indicated within the separate sections of the document to help guide where further input/discussion/guidance may be needed.

This template aims to report the indicator development for HOLAS III, allowing for technical guidance and endorsement by STATE & CONSERVATION 15-2021 and also simultaneously to facilitate the threshold value approval process by HOD 61-2021.

Action requested

The Meeting is invited to:

- provide further technical guidance to the indicator leads and experts, including specific requests defined within the document;
- consider and endorse the proposed developments of the indicator for use in the HOLAS III assessment, including conducting a test evaluation for the extension to offshore waters.

Abundance of waterbirds in the wintering season

Indicator name

Abundance of waterbirds in the wintering season

Scale of assessment for HOLAS III and rationale

Unchanged compared to HOLAS II, the assessment will be conducted on the geographic scale of aggregated sub-basins, i.e. seven subdivisions consisting of 1-4 sub-basins. The subdivisions are defined as follows:

- A: Kattegat (Kattegat),
- B: Belt Group (Great Belt, The Sound),
- C: Bornholm Group (Kiel Bay, Bay of Mecklenburg, Arkona Basin, Bornholm Basin),
- D: Gotland Group (Gdansk Basin, Eastern Gotland Basin, Western Gotland Basin, Gulf of Riga),
- E: Åland Group (Northern Baltic Proper, Åland Sea),
- F: Gulf of Finland (Gulf of Finland),
- G: Bothnian Group (Bothnian Sea, The Quark, Bothnian Bay).

Spatial coverage of the indicator for HOLAS III

In HOLAS III, the inclusion of data from offshore surveys will enable an assessment covering the entire Baltic Sea including areas off the coast. In HOLAS II, the results of the assessment were applied only to the coastal region, because the assessment was built on land-based counts of waterbirds only.

Methodology to be applied for HOLAS III and rationale

The indicator remains unchanged in its basic structure compared to HOLAS II. What is new is the integration of data from offshore surveys. This means that not only wintering areas of waterbirds further away from the coast are included in the assessment, but also those species of which at least part of the population is wintering in those areas and which could not be assessed in HOLAS II can be included. Land-based counts and surveys at sea are initially analysed separately, but then the results are combined.

Coastal waterbirds are assessed in the same way as before, comparing index values from the assessment period with baseline index values. Details can be found in the previous indicator report from HOLAS II.

The methodological framework to analyse offshore date and to combine them with results from the land-based counts were developed for JWGBIRD by Mercker (2016) and further elaborated by Mercker et al. (2021). These publications give recommendations for the sampling design, data handling and the statistical approach for offshore surveys, and much of this has been taken account in the HELCOM monitoring guidelines on this topic (HELCOM 2015).

After the application of distance-correction to raw offshore bird data stemming from aerial surveys (observers or digital imaging) and ship-based surveys, the data from these survey methods can be pooled and then analysed using General Additive Mixed Models (GAMMs). For each species, the resulting trends are then combined with trends obtained from General Additive Models (GAMs) applied to the land-based midwinter count data from the coordinated International Waterbird Census (IWC). This is done by an approach frequently used in meta-analysis studies. Average annual population change is calculated as a weighted average, with weights corresponding to the percentage of the overall monitored population using the respective habitat (offshore or coastal region). Combined trends are finally converted to index values allowing to assess the population size during the assessment period against the threshold.

Threshold value setting logic and rationale

Threshold setting remains unchanged compared to the assessment of wintering waterbird abundance in HOLAS II. The status of species is poor if the abundance in the assessment period

deviates more than 30% (20% in species laying only one egg per year) downwards from the abundance in the reference period. Upward deviations (>30% above abundance at the baseline) are not considered to reflect a failure to achieve the threshold value indicating good status, however they are reported as possible indications of imbalance in the ecosystem.
As it is difficult to identify a reference level representing pristine conditions, bird abundances from the beginning of data compilation (typically 1991-2000) are used to define the baseline state as a pragmatic approach. Any single year is prone to random events influencing the number of birds in that year, and therefore the baseline status is defined by the mean abundances of the relevant species during the period 1991-2000.
The indicator has the following links to policies:
The *Baltic Sea Action Plan* aspires *viable populations of the species* as well as *thriving and balanced communities of plants and animals*. Both objectives include ensuring that seabird populations do not decline.
The threshold of this indicator is strongly linked to the MSFD biodiversity criterion D1C2, which requires that *the population abundance of the species is not adversely affected due to anthropogenic pressures, such that its long-term viability is ensured* (Commission Decision 2017/848).

Threshold value(s)

70% of the baseline abundance (species laying ≥2 eggs per year).
80% of the baseline abundance (species laying 1 egg per year).

Other significant issues that need to be addressed or presented to State and Conservation

The extension of the indicator to offshore parts of the Baltic Sea may not be possible for all subdivisions of the Baltic Sea, depending on the availability of offshore bird data.
This template was circulated among all experts of the OSPAR/HELCOM/ICES Joint Working Group on Marine Birds (JWGBIRD) for reviewing and commenting. Comments have been received from experts in HELCOM Contracting Parties (DK, PL) and have been taken into account in the preparation of the final version.

Latest indicator report or (for new indicators) initially completed indicator template

HELCOM 2018. Abundance of waterbirds in the wintering season. HELCOM Core Indicator Report. https://helcom.fi/media/core%20indicators/Abundance-of-waterbirds-in-the-wintering-season-HELCOM-core-indicator-2018.pdf

References

HELCOM 2015. Guidelines for coordinated monitoring of wintering birds in the Baltic Sea. https://helcom.fi/wp-content/uploads/2019/08/HELCOM-guidelines-for-coordinated-monitoring-of-wintering-birds.pdf
Mercker M 2016. Trend analysis and census of seabirds: recommended statistical approach. In: ICES, Report of the OSPAR/HELCOM/ICES Working Group on Marine Birds (JWGBIRD), 10–14 October 2016, Thetford, UK, ICES CM 2016/ACOM:29, pp. 28-46.
Mercker M, Markones N, Borkenhagen K, Schwemmer H, Wahl J & Garthe S 2021. An integrated framework to estimate seabird population numbers and trends. Journal of Wildlife Management 85: 751-771.