Baltic Marine Environment Protection Commission

Working Group on the State of the Environment and Nature Conservation

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STATE & CONSERVATION 15-2021

Document title	Harbour porpoise distribution
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Background

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 input on the yellow highlighted text passages, concerning additional location data for the Baltic Proper population and additional existing reporting systems;
- consider and endorse the proposed developments of the indicator for use in the HOLAS III assessment.

Harbour porpoise distribution

Indicator name
Distribution of harbour porpoises
Scale of assessment for HOLAS III and rational
No distribution indicator for harbour porpoises will be available for HOLAS III. However, a qualitative assessment of distribution will be conducted for the Baltic Proper population as a part of the HELCOM BLUES project (https://blues.helcom.fi/) based on a review of historic information and comparison to the current status. This qualitative assessment will be carried out using Scale 2 HELCOM assessment units. No assessment of the Belt Sea population will be completed for HOLAS III.
Spatial coverage of the indicator for HOLAS III
No distribution indicator for harbour porpoises will be available for HOLAS III. However, a qualitative assessment of distribution will be conducted for the Baltic Proper population as a part of the HELCOM BLUES project (https://blues.helcom.fi/) based on a review of historic information and comparison to the current status. This qualitative assessment will be carried out at the population level, over the entire management range of the Baltic Proper population, i.e. the Arkona basin and eastwards.
Methodology to be applied for HOLAS III and rational
No distribution indicator for harbour porpoises will be available for HOLAS III. However, a qualitative assessment of distribution will be conducted for the Baltic Proper population as a part of the HELCOM BLUES project (https://blues.helcom.fi/) based on a review of historic information and comparison to the current status. The methodology used to complete the review and compare historic to current information is described below. Harbour porpoise records from the late 17th century until 2019 have been reviewed in the waters of all countries around the Baltic Sea. These records could include bycatch, animals that were killed or hunted, incidental sightings, effort sightings, strandings, and reports with unknown type. Data have been compiled from published sources such as scientific papers, reports, museum records, as well as the HELCOM Map and Data service and the HELCOM/ASCOBANS harbour porpoise database (the complete available dataset for the latter two databases was provided by HELCOM). Additionally, contacts have been made with countries from which data access has been limited or unknown. As the distribution range of the Baltic Proper harbour porpoise population varies over the year (Benke et al., 2014; Carlén et al., 2018; Gallus et al., 2012; ICES, 2020), the review has focused on the HELCOM sub-basins ranging from Bornholm Basin and eastwards around summer, and from Arkona Basin and eastwards around winter. In addition to the information already available in the HELCOM/ASCOBANS harbour porpoise database, data from the following sources were compiled [if you know of any additional sources from your country that may have not been checked, please let us know]: **Denmark**: Historical data on observations in the Bornholm area during winter have been compiled from published reports and articles (Johansen, 1929) [additional sources, including Alander 1949 and Lönnberg 1949 remain to be reviewed]. **Estonia**: Data have been compiled from a review of harbour porpoise observations in Estonian waters. The review consisted of searches through newspaper articles, museum records and interviews with coastal people, and all records were geographically positioned (Jüssi & Liivak, 2005). **Finland**: All data, including historical records, were available in the HELCOM/ASCOBANS Harbour porpoise database. **Germany**: TiHO and DMM confirmed they

are not aware of any additional records that have not been submitted to the HELCOM database. We were directed to www.schweinswale.com that collected records between 1987 to 2014, and will compare these to those already in the HELCOM/ASCOBANS database for duplicates (unless someone knows that these have already been submitted to the database). **Latvia**: We were informed by the Nature Conservation Agency of the Latvian Government that all information from Latvia is already in the HELCOM/ASCOBANS database, and that there may be additional records in online newspapers (http://www.periodika.lv/). This site only includes newspaper records back until 1990. **Lithuania**: Data have been compiled from a review of harbour porpoise observations made for a protection plan and a summary of an action plan for harbour porpoises (Lithuanian Ministry of Environment, 2012). We identified geographical positions based on the written descriptions of the record. **Poland**: Data on historical observations have been compiled from published articles on observations of harbour porpoises, including records from bounty schemes (Psuty, 2013; Skóra and Kuklik, 2003). **Russia:** Data have been compiled from a report for a project reviewing the harbour porpoise presence in Russian territorial waters of the Baltic Sea (Guschin & Fedorov, 2011). This review consisted of questionnaires to sea users, searches through museum records, and field observations (including beach searches). We identified geographical positions based on the written descriptions of the record. **Sweden**: We compiled data from historical newspaper articles using a national database (https://tidningar.kb.se/) with a search for the word 'tumlare' (porpoise in Swedish). Currently, all records up to around the year 1906 for the three northernmost Swedish regions (Norrbotten, Västerbotten and Västernorrland) have been compiled. We quality controlled the records for species, and determined a geographical position for the record based on the written description. We will complete the compilation of records for all regions within the management range of the Baltic Proper harbour porpoise population, and continue in time until national reporting systems for harbour porpoise observations were established. Further, we compiled data on historical observations on the occurrence of harbour porpoises from published reports and articles (Ekman, 1938; Lindroth, 1962; Otterlind, 1976) [additional sources, including Lönnberg 1949 remain to be reviewed].

All data are being compiled in a standardised format to facilitate upload to the HELCOM/ASCOBANS Harbour porpoise database at the completion of the review.

In order to ensure that only records likely to represent the Baltic Proper population were included in the analysis, the summer management border designated during the SAMBAH project (Carlén et al., 2018) was used for the analysis, and applied year round. Although individuals from the Baltic Proper population likely move west of this line, especially during the winter months, it is impossible to separate records in this area from the more abundant Belt Sea population. Although records west of this line were excluded from the analyses, examples of records where it is thought the information is likely to relate to the Baltic Proper population are still discussed in the results and discussion. To visualise changes in abundance and distribution of harbour porpoises within the management range of the Baltic Proper harbour porpoise population over time, maps and histograms will be produced for specific basins or sub-basins. Historical data will be compared to current information, including the most recent information on distribution and abundance from the SAMBAH project, and any published information from national monitoring programs.

In order to attempt to quantify changes in effort, and the likelihood of reports of harbour porpoises being received, the existence and start date of any strandings program or incidental sightings reporting system within the Baltic Sea in each country will also be described [If you have any information on such dates and websites/organisations in your country please send us the information to fill in the below table- this includes information that no site/app exists in your country].

Country	Data host/website	Strandings/dead animals	Incidental live sightings	Date started-ended
Denmark				

Estonia				
Finland				
Germany	DMM			
	http://www.schweinswale.com/	Yes	Yes	1987-ongoing
Poland	Hel Marine Station	Yes	Yes	1986-2010
	Hel Marine Station and WWF	Yes	Yes	2010-ongoing
Latvia				
Lithuania				
Russia				
Sweden	Swedish Museum of Natural History, www.nrm.se/tumlare	Yes	Yes	4 July 2003 - ongoing
	SLU Swedish Species Information Centre	Yes	Yes	XXXX - ongoing
All	HELCOM/ASCOBANS database	Yes	Yes	2004-ongoing

The assessment has been carried out on the population level, and applied on all HELCOM sub-basins overlapping with the management range of the Baltic Proper harbour porpoise population, i.e. the Arkona basin and eastwards.

Threshold value setting logic and rational

No distribution indicator for harbour porpoises will be available for HOLAS III. However, a qualitative assessment of distribution will be conducted for the Baltic Proper population as a part of the HELCOM BLUES project (https://blues.helcom.fi/) based on a review of historic information and comparison to the current status. No thresholds will be set as a part of the qualitative assessment process.

Threshold value(s)

No distribution indicator for harbour porpoises will be available for HOLAS III. However, a qualitative assessment of distribution will be conducted for the Baltic Proper population as a part of the HELCOM BLUES project (https://blues.helcom.fi/) based on a review of historic information and comparison to the current status. No thresholds will be set as a part of the qualitative assessment process.

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

There are some issues with data accuracy within the HELCOM Map and Data service and HELCOM Biodiversity database that have been brought to the attention of HELCOM. These issues need to be resolved prior to the review and qualitative assessment being completed as a part of HELCOM BLUES. There is still the need for a workshop (as proposed in S&C-14) to further progress the development of a distribution indicator for harbour porpoises in the future, hopefully in time for HOLAS IV.

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

Please see documents in annex
Document template EG MAMA 14-2020_Harbour porpoise distribution
Draft Qualitative Assessment Baltic Proper HP_draft for EG MAMA

Distribution of harbour porpoises

Document development status/update from the expert group (EG)

(Section below to be moved to appropriate sections of the final indicator document)

- **Indicator development and assessment:** The indicator will be developed and assessed at two scales: *population distribution* (assessed using population level surveys, e.g. SCANS and SAMBAH) vs. *trends in distribution* (assessed using monitoring at key sites and population level surveys) for both populations of harbour porpoises in the HELCOM region, i.e. Belt Sea population and Baltic Proper population. It is important that Good Environmental Status (GES) is defined and assessed separately for the two porpoise populations.
- **Population distribution indicator:** For both populations, this indicator will likely be assessed as a two-step process: Step 1) Population level surveys (e.g. SCANS and SAMBAH) will be used to determine whether a change in distribution has occurred over time, and Step 2) any change will be related to the concurrent assessment of absolute abundance for the population. This two-step process is due to the nature of highly mobile marine species. It is very difficult to assess whether an increase or decrease in distributional range is a good or bad thing without additional information on population status, or ideally, habitat quality over the current range. For both of the populations, it is possible that the EG will be able to develop a population distribution indicator for HOLAS IV to determine whether a change in distribution has occurred over time (step 1). Within the western Baltic Sea (Kattegat, Belt Seas, the Sound, and the Western Baltic, inhabited by the 'Belt Sea population'), SCANS (1994) was the first assessment of distribution. However, the methods used in this survey were different to the other surveys completed to assess surface density of this population. As a result, the SCANS II (2005) may be the first information available for assessment of distribution, until methods to compare the varying methods are developed. For MiniSCANS II (2020), a change in survey platform (i.e., from boat to aircraft) also took place. However, the switch in platform still resulted in a robust unbiased abundance estimate, thus making the estimates comparable. If an indicator for population distribution is developed in time, and the required abundance information is available and sufficient, it is possible that an assessment GES for the distribution of the Belt Sea population could be completed for HOLAS IV. For the Baltic Proper population, no dedicated large-scale surveys on distribution (or the required information on abundance) covering the currently known distribution range of the population were conducted prior to, or since, SAMBAH (2011-2013), meaning that an assessment based on a measured change in population distribution relative to changes in absolute abundance is not possible. However, a qualitative assessment of GES will be made for HOLAS III for the Baltic Proper population as a part of the HELCOM BLUES project. A proposal was submitted to HELCOM S&C-14 2021 suggesting that a workshop be held some time in 2022 to further develop the planning of this indicator for both populations.
- **Trend in distribution indicator:** According to the MSFD, Member States are able to use directional trends as proxies until threshold values are established through the Union. Since population-wide surveys do not happen regularly for this species in the region, key site monitoring data will be used to supplement population-wide surveys and assess trends in the distribution at shorter time intervals

than if based on population-scale assessments only. Key site monitoring will occur as a part of ongoing national monitoring programs, long-term visual or acoustic monitoring, or the establishment of new monitoring programs at key sites in each country. It is possible that an assessment of the current status of the distribution of the Belt Sea population will be completed for HOLAS IV. However, it is unknown whether an assessment of trends can be made for the Baltic Proper population in HOLAS IV at this stage due to a shortage of data over a long enough period to assess trends. A proposal was submitted to HELCOM S&C-14 2021 suggesting that a workshop be held some time in 2022 to further develop the planning of this indicator for both populations.

Table showing the foreseen status of the indicator development on harbour porpoise distribution by HOLAS III.

	Population distribution		**Trend in distribution**	
	Indicator developed	Assessed	Indicator developed	Assessed
Belt Sea population	No	No	No	No
Baltic Proper population	No	Yes (qualitative)	No	No

- **Monitoring guidelines:** one document will be developed that outlines the methods recommended for monitoring harbour porpoises in both populations in the HELCOM area (Belt Sea population and Baltic Proper population). In the western Baltic Sea, in the range of the Belt Sea population, two monitoring methods are implemented (visual aerial surveys and passive acoustic monitoring (PAM)). In the range of the Baltic Proper population only PAM is implemented as the population abundance is too low for successful visual surveys. The monitoring guidelines document will contain details on methods for both visual and acoustic surveys, and provide suggestions for criteria to determine the location of key sites. The EG has compiled information on current monitoring programmes within each HELCOM CPs and has begun developing suggestions for key sites criteria, which should be monitored by CPs to assess trends in distribution between larger scale population-wide surveys. This process will also highlight the differences in monitoring programs between countries, likely showing the need for a more harmonised distribution-wide monitoring program. Where a country has no current or previous monitoring program, the EG will likely recommend key sites be selected as areas that have:
    1) the highest density of porpoises during population-wide survey locations (e.g. SAMBAH stations in the Baltic Proper),
    2) historical importance for the porpoise populations, or
    3) similar environmental features to known harbour porpoise hotspots (e.g. offshore banks in the Baltic Proper).

The EG will continue work on this document and the development of indicators in 2021/2022.

Key Message

Distribution of harbour porpoises

This core indicator evaluates whether the distribution of harbour porpoises (*Phocoena phocoena*) in the Baltic Sea is adversely affected due to anthropogenic pressures, such that its distributional range and pattern is in line with prevailing physiographic, geographic and climatic conditions. In general, good environmental status for distribution is achieved when a population's distribution [tbd - method to be developed].

The HELCOM area is inhabited by two separate harbour porpoise populations: (i) the Belt Sea population in southern Kattegat, the Belt Sea, the Sound, and south-western Baltic, and the (ii) the Baltic Proper population in the waters east thereof (summer distribution range, winter distribution range uncertain for the Baltic Proper population) (Carlén et al., 2018; Sveegaard et al., 2015). The assessments are carried out separately for the two populations, and if deemed sensible presented on the level of HELCOM sub-basins. The assessment of population distribution is always completed on the population level, with the population level abundance assessments used to determine whether the observed change in distribution is likely to be indicative of a positive or negative trend for the population. Trends in distribution are to be assessed on population-wide data when available. On shorter time scales, a trend in porpoise distribution at key sites is to be assessed, indicative of a change in the population distribution. The rationale behind this approach is that large-scale international population surveys that provide information on abundance are only conducted at long time intervals. For the Belt Sea population, SCANS surveys have been carried out about every 10 years, although the aim is every 6 year, with MiniSCANS occurring at intervals between. For the Baltic Proper population, a SAMBAH survey has only been carried out once, and will hopefully continue on a 10-12 year time-scale with SAMBAH II proposed for monitoring to begin in 2023/2024 depending on funding availability. However, most HELCOM Contracting Parties have developed national monitoring programmes that also provide important information on finer spatial and temporal scales that can be used to assess population trends at key sites.

The assessment of the **Belt Sea population** is based on data from five dedicated visual surveys from 1994 to 2020 (Hammond et al., 2017, 2013, 2002; Viquerat et al., 2014; including MiniSCANS-II (2020) - not yet published). [Outcome of the assessment]

The assessment of the **Baltic Proper population** is based on data from one passive acoustic monitoring (PAM) survey in 2011-2013 (SAMBAH, 2016) and historical data. Due to the very low density of the Baltic Proper population, only dedicated acoustic methods should be applied. The 2011-2013 SAMBAH survey identified a summer core area for the Baltic Proper population around the offshore banks; Hoburg's Bank, and the Northern and Southern Mid-Sea Banks. Acoustic detections were made in all EU Member States except Estonia (Carlén et al., 2018). [Outcome of the assessment]

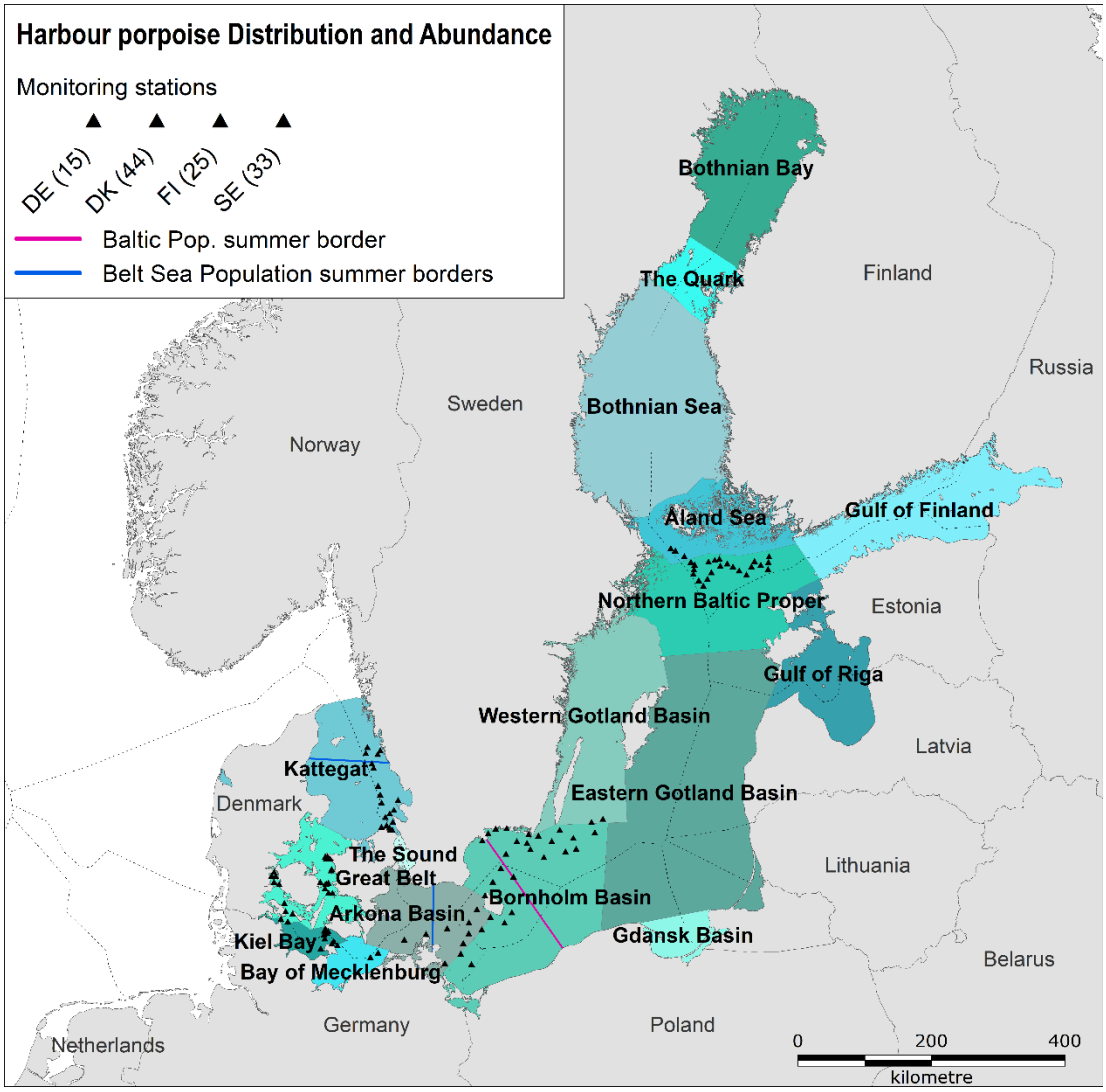

Figure 1: Temporary (to be changed) map showing proposed management units for harbour porpoises during summer, acoustic monitoring stations for harbour porpoises (Polish data are missing), and HELCOM sub-basins. [The final map shall show "Key message figure 1: Status assessment results based evaluation of the indicator 'Distribution of harbour porpoises'. The assessment is carried out using Scale X HELCOM assessment units (defined in the HELCOM Monitoring and Assessment Strategy Annex 4)."]

The confidence of the indicator evaluation is considered to be low/medium/high for the Belt Sea population and low/medium/high for the Baltic Proper population. The indicator is applicable in the waters of all nine countries bordering the Baltic Sea. Add comment on regional differences, such as the low density of Belt Sea Porpoises E of 13°E and of Baltic Proper porpoises N of Åland Sea/ Archipelago Sea.

Relevance of the core indicator

The indicator 'Distribution of harbour porpoises' signals changes in the distribution of a marine top predator in the Baltic Sea. Being top predators of the marine ecosystem, harbour porpoises are good indicators of the state of food webs, levels of hazardous substances, direct human disturbance and incidental removal.

Policy relevance of the core indicator

	BSAP Segment and Objectives	MSFD Descriptors and Criteria
Primary link	Biodiversity • Viable populations of species	D1 Biodiversity • D1C2 Population abundance • D1C4 Species distributional range and pattern
Secondary link		D1 Biodiversity • D1C1 Incidental by-catch • D1C3 Population demographic characteristics • D1C5 Habitat extent and condition D4 Food webs • D4C1 Diversity of trophic guild • D4C2 Balance of abundance between the trophic guilds • D4C4 Productivity of trophic guild D8 Contaminants • D8C2 Health of species and condition of habitats • D8C4 Significant acute pollution events D11 Energy and underwater noise • D11C1 Spatial distribution, temporal extent of impulsive noise • D11C2 Spatial distribution, temporal extent of continuous noise
Other relevant legislation: Habitats Directive (92/43/EEC), EU Water Framework Directive (2000/60/EC), EU Maritime Spatial Planning Directive (2014/89/EU), and EU Common Fisheries Policy (1380/2013)		

Cite this indicator

HELCOM (year) Distribution of harbour porpoises. HELCOM core indicator report. Online. [Date Viewed], [Web link].

Download full indicator report

Core indicator report – web-based version [month year] (pdf)

Results and Confidence

Distribution of harbour porpoises

The results of the assessment of distribution are shown in Table 1 and of key site density in Table 2.

Table 1: Assessment of harbour porpoise distribution in the Baltic Sea. Grey: status cannot be assessed yet due to lack of data and an approved indicator. Red: status is sub-GES. White: the area is outside the known historical range of the population. N.a.: not assessed (occurrence of the population in this area is seasonal or uncertain).

	Kattegat	Great Belt	The Sound	Kiel Bay	Bay of Mecklenburg	Arkona Basin	Bornholm Basin	Gdansk Basin	Eastern Gotland Basin	Western Gotland	Gulf of Riga	Northern Baltic	Gulf of Finland	Åland Sea	Bothnian Sea	The Quark	Bothnian Bay
Harbour porpoise Belt Sea population							n. a. [1]										
Harbour porpoise Baltic Proper population					n. a. [2]												

[1]Seasonal occurrence.

[2]Occurrence uncertain.

Confidence of the indicator status evaluation

Harbour porpoise – Belt Sea population

The confidence of the distribution assessment is low/medium/high (tbd).

The Belt Sea population resides in southern Kattegat, the Belt Seas, the Sound and the south-western Baltic. The best summer management unit for this population was defined by (Sveegaard et al., 2015) to be 13.5˚E towards the Baltic Proper in the East and 57˚N towards Skagerrak in the North. At present only the SCANS-III survey (2016) (Hammond et al., 2017) and the MiniSCANS-II (2020) surveys were limited to the new management unit, [INSERT DISTRIBUTION INFORMATION]. Prior to these surveys, three large-scale surveys have been carried out covering parts of or more than the management range of the Belt Sea population, namely SCANS (1994) (Hammond et al., 2002), SCANS-II (2005) (Hammond et al., 2013), and MiniSCANS (2012) (Viquerat et al., 2014) (see Figure 3). However, DISTRIBUTION RESULTS (Figure 4).

Confidence assessment information on distribution.

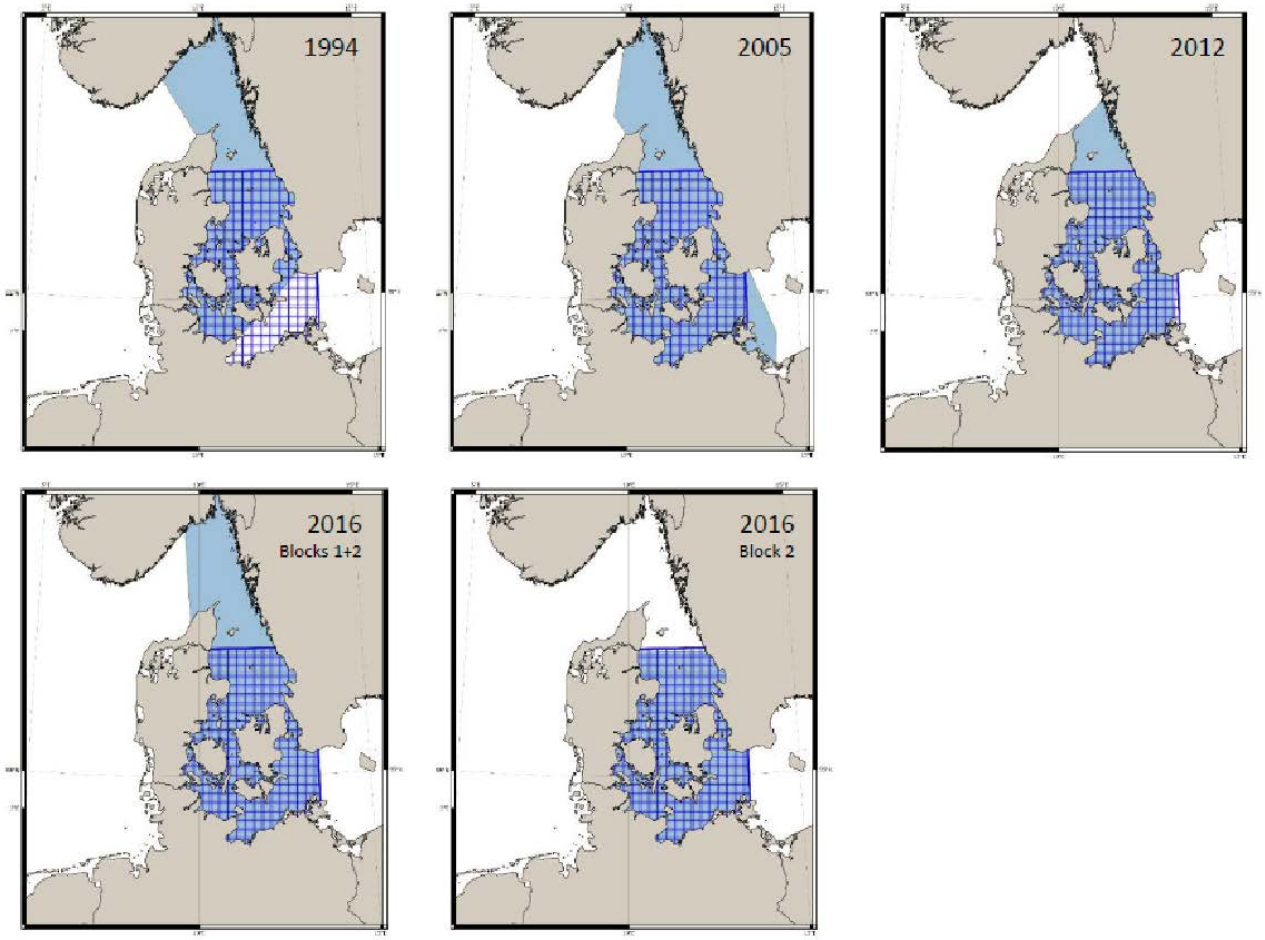

Figure 3: Areas covered during the three SCANS surveys (1994, 2005, 2016; Hammond et al. 2002, 2013, 2017) and the "MiniSCANS" survey in 2012 (Viquerat et al. 2014) (MiniSCANS (2020) to be added) in the Skagerrak/Kattegat/Belt Seas (coloured light blue) compared with the area believed to represent a separate population (Sveegaard et al. 2015) (cross-hatched dark blue).

Figure 4: ADD DISTRUTION changes/trends info

Harbour porpoise – Baltic Proper population

The confidence of the distribution assessment is low/medium/high.

The harbour porpoise population in the Baltic Proper has only been assessed once, namely in the SAMBAH project 2010-2015 (SAMBAH, 2016). Here, passive acoustic monitoring and species distribution models were used to describe the spatial and seasonal distribution of harbour porpoises in the Baltic Proper (Carlén et al., 2018). Porpoise click detectors were deployed over a systematic grid of 304 stations in eight countries 2011-2013. Generalized additive models (GAMs) were used to describe the monthly probability of detecting porpoise clicks as a function of spatially-referenced covariates and time. During the reproductive season, two main areas of high probability of porpoise detection were identified. One of those areas, situated on and

around the offshore banks Hoburg's Bank and the Northern and Southern Mid-Sea Banks in the Baltic Proper, is clearly separated from the known distribution range of the Belt Sea population during breeding season, suggesting this is an important breeding ground for the Baltic Proper population. This separation led to the identification of a south-western management border during May – October for the Baltic Proper harbour porpoise population stretching from Hanö Bight in south-eastern Sweden to a point on the Polish coast close to Słupsk (Carlén et al., 2018).

Good Environmental Status (GES)

Distribution of harbour porpoises

GES with respect to the distribution of harbour porpoises is determined by XXX that have been defined based on concepts developed for the conservation of porpoises (ref) (Figure 5)

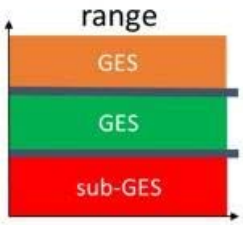

Figure 5: Good environmental status (GES) is achieved when XXX are above the threshold value.

[GES boundary definition for DISTRIBUTION/DISTRIBUTIONAL PATTERN, quantitative value in first paragraph, more details in following paragraphs]

Assessment Protocol

[indicator assessment methodology described as a step-by-step protocol from processing or raw data until indicator assessment result for assessment unit]

Assessment units

The assessments of harbour porpoise distribution on population and local scales (key sites) are carried out separately for the two populations, and if deemed sensible presented on the level of HELCOM sub-basins. HELCOM's assessment units are defined in the HELCOM Monitoring and Assessment Strategy Annex 4.

Relevance of the Indicator

Biodiversity assessment

The status of biodiversity is assessed using several core indicators. Each indicator focuses on one important aspect of the complex issue. In addition to providing an indicator-based evaluation of the distribution of harbour porpoises, this indicator will also contribute to the next overall biodiversity assessment to be completed in 20XX along with the other biodiversity core indicators.

Policy relevance

This distribution of harbour porpoises indicator addresses the Baltic Sea Action Plan's (BSAP) overall goal of a favourable conservation status of Baltic Sea biodiversity, specifically the ecological objective of 'Viable populations of species'. This indicator is related to the targets:

- 'By 2021 all elements of the marine food webs, to the extent that they are known, occur at natural and robust abundance and diversity'
- 'By 2015, improved conservation status of species included in the HELCOM lists of threatened and/or declining species and habitats of the Baltic Sea area, with the final target to reach and ensure favourable conservation status of all species'.

The indicator has relevance to the HELCOM Recommendation 17/2 (https://helcom.fi/media/recommendations/Rec-17-2_revised-2020.pdf) and HELCOM Recommendation 37/2 (https://www.helcom.fi/wp-content/uploads/2019/06/Rec-37-2.pdf), where the Baltic Sea States have agreed to protect the harbour porpoise in the Baltic marine area. In 2020, the Contracting Parties to HELCOM adopted an amended version of Recommendation 17/2.

The indicator also addresses the following qualitative descriptors of the MSFD for determining good environmental status (European Commission 2008):

- Descriptor 1: 'Biological diversity is maintained. The quality and occurrence of habitats and the distribution and abundance of species are in line with prevailing physiographic, geographic and climatic conditions' and
- Descriptor 4: 'All elements of the marine food webs, to the extent that they are known, occur at normal abundance and diversity and levels capable of ensuring the long-term abundance of the species and the retention of their full reproductive capacity' and,
- Descriptor 8: 'Concentrations of contaminants are at levels not giving rise to pollution effects'
- Descriptor 11: 'Introduction of energy, including underwater noise, is at levels that do not adversely affect the marine environment'

Specifically, the indicator primarily addresses the following criteria of the MSFD:

- D1 Biodiversity
    - D1C2 (Population abundance)
    - D1C4 (Species distribution range and pattern)

In addition, the indicator addresses some secondary links to:

- D1 Biodiversity

  - D1C1 (Incidental by-catch)
  - D1C3 (Population demographic characteristics)
  - D1C5 (Habitat extent and condition)
- D4 Food webs
  - D4C1 (Diversity of trophic guild)
  - D4C2 (Balance of abundance between the trophic guilds)
  - D4C4 (Productivity of the trophic guild)
- D8 Contaminants
  - D8C2 (Health of species and condition of habitats)
  - D8C4 (Significant acute pollution events)
- D11 Energy and underwater noise
  - D11C1 (Spatial distribution, temporal extent of impulsive noise)
  - D11C2 (Spatial distribution, temporal extent of continuous noise)

The indicator is also highly relevant to the implementation of the Habitats Directive (HD, 92/43/EEC). Additionally, the indicator is of relevance to the ASCOBANS Recovery Plan for Baltic Harbour Porpoises (Jastarnia Plan), and EU and BALTFISH decisions surrounding Special Request Advice on emergency measures to prevent bycatch of the Baltic Proper harbour porpoise published by ICES. There is also some relevance of this indicator to the EU Common Fisheries Policy (1380/2013) and the EU Maritime Spatial Planning Directive (2014/89/EU).

Role of the harbour porpoise in the ecosystem

Harbour porpoises are likely to have played an important role in the past functioning of the Baltic Sea ecosystem. However, it is highly unlikely that they fulfil this role currently, due to the low population abundance and critically endangered status, which means that the Baltic harbour porpoise is in fact ecologically extinct. The presence of top predators allows for natural control of the distribution, abundance, diversity, and health of their prey species, with harbour porpoises likely previously playing an important role in maintaining natural balance in the Baltic Sea ecosystem. Being a highly mobile species both horizontally over space and vertically over depth, harbour porpoises also likely played an important role in nutrient transfer across the Baltic Sea region. If not sure severely reduced, the species can also act as a good indicator of changes in the Baltic Sea ecosystem, as they are sensitive to changes at lower levels in the ecosystem and human induced pressures. One of the strongest threats to harbour porpoises is the risk of being bycaught in fishing gear, which results in direct mortality of individuals. Survival and fecundity can also be reduced by exposure to contaminants. Additionally, both impulsive and continuous underwater noise have negative influences on porpoises, ranging from behavioural disturbance that reduces the efficiency of foraging and communication, through to permanent injury and death. Harbour porpoises have high-energy requirements and must feed almost continuously to meet energy demands. This makes the species particularly susceptible to negative impacts from resource depletion and disturbance from human presence. In populations that are healthy and not exposed to high levels of pressures, harbour porpoises have shown population increases of 9-10% per year. As the abundance of the Baltic Proper population is critically low, it is not influenced by density dependence issues. A level of growth (or a decline) significantly lower than the level of known possible population growth for the species indicates that there is likely

something within the ecosystem that is restricting the population, and that human pressures may be causing an issue in the natural state of the Baltic Sea.

Human pressures linked to the indicator

There are a number of human pressures listed in Annex III of the MSFD that are linked to the indicator on the distribution of harbour porpoises. These include:

- **Biological features:**
    - **A description of the population dynamics, natural and actual range and status of species of marine mammals and reptiles occurring in the marine region or sub-region.** For harbour porpoises, this relates to porpoise distribution and abundance.
    - **Information on the structure of fish populations, including the abundance, distribution and age/size structure of the populations.** For harbour porpoises, this relates to prey availability and quality.
- **Biological disturbance: selective extraction of species, including incidental non-target catches (e.g. by commercial and recreational fishing).** For harbour porpoises, this relates to two distinct issues: 1) bycatch of the porpoises themselves resulting in direct mortality, and 2) reduction in the quality and quantity of prey resources due to competition with fisheries.
- **Other physical disturbance: Underwater noise (e.g. from shipping, underwater acoustic equipment), and marine litter.** For harbour porpoises, this includes both impulsive noise (short and powerful noise from sources such as seismic surveys, pile driving, and underwater explosions) as well as continuous noise (from sources such as shipping and wind farm operation). Marine litter (plastic) is also an issue for marine mammals that often results in mortality or reduced health. Ghost nets (lost or discarded fishing gear) can also result in direct mortality when animals become entangled.
- **Contamination by hazardous substances- Introduction of synthetic compounds and introduction of non-synthetic substances and compounds.** For harbour porpoises, high levels of contaminants have been shown to result in decreased fertility and increased mortality, particularly in calves that receive high levels of contaminants from their mother.
- **Physical and chemical features: annual and seasonal temperature regime and ice cover, current velocity, upwelling, wave exposure, mixing characteristics, turbidity, residence time.** For harbour porpoises this can relate to the influence of climate change resulting in warmer water and more dead zones in the Baltic Sea.

Monitoring Requirements

Monitoring methodology

Monitoring of the distribution of harbour porpoises in the Contracting Parties of HELCOM is described on a general level in the **HELCOM Monitoring Manual in the [hyperlink to sub-programme]-**

Specific monitoring guidelines for [hyperlink to monitoing guidelines in HELCOM Monitoring Manual if available].

Current monitoring

The monitoring activities relevant to the indicator that are currently carried out by HELCOM Contracting Parties are described in the HELCOM Monitoring Manual

Sub-programme: [hyperlink to monitoring concepts table in relevant sub-programme]

[if relevant, discussion on current differences in monitoring efforts in different regions of the Baltic Sea]

Description of optimal monitoring

[short discussion on what monitoring effort would be needed to achieve high confidence in the indicator assessment based on monitoring data and any current gaps]

SAMBAH data gap:

The SAMBAH survey did not cover waters north of the Åland Sea/ Archipelago Sea, or waters deeper than 80 m due to logistical constraints.

Data and updating

Access and use

The data and resulting data products (tables, figures and maps) available on the indicator web page can be used freely given that the source is cited. The indicator should be cited as following:

HELCOM (201X) [Name of indicator]. HELCOM core indicator report. Online. [Date Viewed], [Web link].

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Contributors and references

Contributors

Ida Carlén, Julia Carlström, Michael Dähne, Anita Gilles, Olli Loisa, Dominik Nachtsheim, Kylie Owen, Iwona Pawliczka, Signe Sveegaard [to be completed, preliminary all present Indicator Team members are listed in alphabetical order]

Archive

This version of the HELCOM core indicator report was published in [month year]:

Core indicator report – web-based version [month year] (pdf)

Older versions of the core indicator report are available:

[hyperlink to pdf]

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Additional relevant publications

[add other relevant references]

Document title	Draft "Qualitative assessment of the abundance and distribution of the Baltic Proper harbour porpoise"
Code	Secretariat to fill in
Category	CMNT
Agenda Item	4 – Baltic Sea harbour porpoise
Submission date	24.8.2021
Submitted by	Kylie Owen
Reference	

Background

EG MAMA 14-2020 took note of information regarding the development of the indicators on abundance and distribution of harbour porpoises (presentation 9). The Meeting took note that the indicator has been split into 2: "Distribution of harbour porpoises" (document 4-3) and "Abundance and population trends of harbour porpoises" (document 4-2) and that the main development work is now planned to be conducted under the SAMBAH II project, with the aim to have fully functional indicators for HOLAS IV.

Action requested

The Meeting is invited to take note of the draft qualitative assessment and, as needed, provide further guidance for the HELCOM BLUES team, particularly surrounding potential sources of data, and dates of harbour porpoise stranding programs and incidental sighting reporting forums.

Qualitative assessment of the abundance and distribution of the Baltic Proper harbour porpoise

Key Message

This qualitative assessment evaluates the status of the abundance and distribution of the Baltic Proper harbour porpoise. The current abundance and distributional pattern are compared to historical data on harbour porpoise occurrence within the population's management range. No quantitative thresholds are available, but the comparisons show that the abundance and distribution of the Baltic Proper harbour porpoise do/do not achieve good environmental status (GES). The confidence of the qualitative assessment is high/medium/low, although not quantifiable. The qualitative assessment is applicable in the waters of all nine countries bordering the Baltic Sea, including areas such as Bothnian Bay that are currently considered to be outside of the distributional range of the Baltic Proper harbour porpoise population.

(GES assessment map: produced once the analysis completed and assessment complete)

Key message figure 1: Status qualitative assessment results based on evaluation of the abundance and distribution of the Baltic Proper harbour porpoise. The qualitative assessment is carried out using Scale 2 HELCOM assessment units (defined in the HELCOM Monitoring and Assessment Strategy Annex 4).

Relevance of the qualitative assessments

The qualitative assessment signals changes in the abundance and distributional range of a top predator in the Baltic Sea. As a top predator in the marine ecosystem, the harbour porpoise is a good indicator of the state of food webs, levels of hazardous substances, and the degree of human disturbance on the ecosystem. Given the critically endangered status of the Baltic Proper population (IUCN and HELCOM), and the fact that all indicators for this population (and species) are still under development, this qualitative assessment is necessary for the population to be included in HOLAS III as a key component of the ecosystem.

Policy relevance of the qualitative assessment

	BSAP Segment and Objectives	**MSFD Descriptors and Criteria**
Primary link	Biodiversity • Viable populations of species	D1 Biodiversity • D1C2 Population abundance • D1C4 Species distributional range and pattern
Secondary link		D1 Biodiversity • D1C1 Incidental by-catch • D1C3 Population demographic characteristics

	• D1C5 Habitat extent and condition D4 Food webs • D4C1 Diversity of trophic guild • D4C2 Balance of abundance between the trophic guilds • D4C4 Productivity of trophic guild D8 Contaminants • D8C2 Health of species and condition of habitats • D8C4 Significant acute pollution events D11 Energy and underwater noise • D11C1 Spatial distribution, temporal extent of impulsive noise • D11C2 Spatial distribution, temporal extent of continuous noise
Other relevant legislation: Habitats Directive (92/43/EEC), EU Water Framework Directive (2000/60/EC), EU Maritime Spatial Planning Directive (2014/89/EU), and EU Common Fisheries Policy (1380/2013)	

Cite this assessment

HELCOM (2021). Qualitative assessment of the abundance and distribution of the Baltic Proper harbour porpoise. HELCOM core indicator report. Online. [Date Viewed], [Web link].

Download full assessment report

Qualitative assessment report – web-based version [month year] (pdf)

Results and Confidence

Of the XX records (bycatch, hunted or killed, stranded, incidental sightings, effort sightings, and reports with unknown type) in the HELCOM/ASCOBANS harbour porpoise database, XX were identified as being within the management range of the Baltic Proper population (see methods below for area description and data inclusion protocol), and included in this qualitative assessment. Additionally, a total XX additional records within the management range of the Baltic Proper population that were not previously in the HELCOM/ASCOBANS harbour porpoise database have been identified.

The review is being completed by the Swedish Museum of Natural History as a part of the HELCOM BLUES project, with assistance on data sources from many experts around the Baltic Sea (see methods section for data sources). As the review is not yet complete, no results are presented. As soon as the review of information is complete, the analysis is expected to be carried out on a basin-level scale, and the results broken down to and presented here on sub-basin level if deemed necessary.

Confidence of the qualitative assessment evaluation

Despite the lack of quantified thresholds, the confidence of the assessments is high/medium/low. All historical records have been reviewed carefully, and only those that have been identified as probable harbour porpoise observations have been included. The description of the locations, on which the geographical positions of the observations were often based on, were overall very accurate. Additionally, the time given for the observations was in most cases on the exact day or week, although in some cases, only an approximate year could be identified. For a few observations, only the year of the first record was given (e.g. date of submission to a museum), but not the original observation date. The level of detail of this information does not reduce the confidence of the qualitative assessment, as it is based on the spatial scale of HELCOM basins/sub-basins and a historical time perspective (decades).

A possible confounding factor of the assessment is that the observation effort of the opportunistic records is unknown. The effort is likely to have varied over time due to factors such as: 1) the number and distribution of people at sea, 2) fishing effort and practices, and 3) the methods available to report an observation. For example, there are in general few records during World War I and II. In contrast, as the human population has increased and motorised recreational vessels become readily available, more people are spending time at sea. (will add more information here once information on timing of sighting/stranding programs have been collated from countries)

Good Environmental Status

Abundance

GES for abundance is achieved when the Baltic Proper harbour porpoise population is above the Limit Reference Level (LRL), and there is a positive trend towards the Target Reference Level (TRL). The LRL is the minimum number of animals required for the population to sustain itself over time. TRL is the level where the growth rate starts to level off and the population asymptotically approaches the current carrying capacity level. No definitions have yet been set for LRL, TRL, carrying capacity, or the increasing trend. There is also no estimate available of the historic population size. For this assessment, GES is achieved when the group sizes and number of sightings in recent years is similar to historic levels (in the early 20th century) (taking into account differences in the probability of receiving a record based on human population size, and reporting methods available).

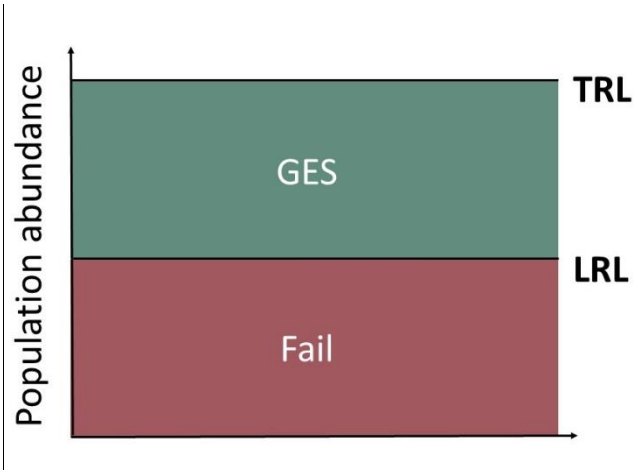

Figure 1. Good environmental status is reached when the population abundance is above the lower reference value (LRL) and has a yet to be defined positive trend towards the target reference level (TRL). The LRL and TRL have also yet to be defined for the Baltic Proper harbour porpoise population.

Distributional range

The metric to be used for a distributional indicator for this species is yet to be defined. Determining a distribution indicator for a highly mobile marine species is challenging, as the animals are difficult to observe in the field, have seasonal movement patterns, and their distribution may vary between years due to natural cycles and anthropogenic pressures. As a result, for this qualitative assessment, good environmental status is achieved when the distributional range of harbour porpoises in the Baltic Sea is the same as historically (in the early 20th century).

Assessment Protocol

Harbour porpoise records from the late 17th century until 2019 have been reviewed in the waters of all countries around the Baltic Sea. These records could include bycatch, animals that were killed or hunted, incidental sightings, effort sightings, strandings, and reports with unknown type.

Data have been compiled from published sources such as scientific papers, reports, museum records, as well as the HELCOM Map and Data service and the HELCOM/ASCOBANS harbour porpoise database (the complete available dataset for the latter two databases was provided by HELCOM). Additionally, contacts have been made with countries from which data access has been limited or unknown. As the distribution range of the Baltic Proper harbour porpoise population varies over the year (Benke et al., 2014; Carlén et al., 2018; Gallus et al., 2012; ICES, 2020), the review has focused on the HELCOM sub-basins ranging from Bornholm Basin and eastwards around summer, and from Arkona Basin and eastwards around winter.

In addition to the information already available in the HELCOM/ASCOBANS harbour porpoise database, data from the following sources were compiled [if you know of any additional sources from your country that may have not been checked, please let us know]: **Denmark**: Historical data on observations in the Bornholm area during winter have been compiled from published reports and articles (Johansen, 1929) [additional sources, including Alander 1949 and Lönnberg 1949 remain to be reviewed]. **Estonia**: Data have been compiled from a review of harbour porpoise observations in Estonian waters. The review consisted of searches through newspaper articles, museum records and interviews with coastal people, and all records were geographically positioned (Jüssi & Liivak, 2005). **Finland**: All data, including historical records, were available in the HELCOM/ASCOBANS Harbour porpoise database. **Germany**: TiHO and DMM confirmed they are not aware of any additional records that have not been submitted to the HELCOM database. We were directed to www.schweinswale.com that collected records between 1987 to 2014, and will compare these to those already in the HELCOM/ASCOBANS database for duplicates (unless someone knows that these data have already been added). **Latvia**: We were informed by the Nature Conservation Agency of the Latvian Government that all information from Latvia is already in the HELCOM/ASCOBANS database, and that there may be additional records in online newspapers (http://www.periodika.lv/). This site only includes newspaper records back until 1990. **Lithuania**: Data have been compiled from a review of harbour porpoise observations made for a protection plan and a summary of an action plan for harbour porpoises (Lithuanian Ministry of Environment, 2012). We identified geographical positions based on the written descriptions of the record. **Poland**: Data on historical observations have been compiled from published articles on observations of harbour porpoises, including records from bounty schemes (Psuty, 2013; Skóra and Kuklik, 2003). **Russia:** Data have been compiled from a report for a project reviewing the harbour porpoise presence in Russian territorial waters of the Baltic Sea (Guschin & Fedorov, 2011). This review consisted of questionnaires to sea users, searches through museum records, and field observations (including beach searches). We identified geographical positions based on the written descriptions of the record. **Sweden**: We compiled data from historical newspaper articles using a national database (https://tidningar.kb.se/) with a search for the word 'tumlare' (porpoise in Swedish). Currently, all records up to around the year 1906 for the three northernmost Swedish regions (Norrbotten, Västerbotten and Västernorrland) have been compiled. We quality controlled the records for species, and determined a geographical position for the record based on the written description. We will complete the compilation of records for all regions within the management range of the Baltic Proper harbour porpoise population, and

continue in time until national reporting systems for harbour porpoise observations were established. Further, we compiled data on historical observations on the occurrence of harbour porpoises from published reports and articles (Ekman, 1938; Lindroth, 1962; Otterlind, 1976) [additional sources, including Lönnberg 1949 remain to be reviewed].

All data are being compiled in a standardised format to facilitate upload to the HELCOM/ASCOBANS Harbour porpoise database at the completion of the review.

In order to ensure that only records likely to represent the Baltic Proper population were included in the analysis, the summer management border designated during the SAMBAH project (Carlén et al., 2018) was used for the analysis, and applied year round. Although individuals from the Baltic Proper population likely move west of this line, especially during the winter months, it is impossible to separate records in this area from the more abundant Belt Sea population. Although records west of this line were excluded from the analyses, examples of records where it is thought the information is likely to relate to the Baltic Proper population are still discussed in the results and discussion. To visualise changes in abundance and distribution of harbour porpoises within the management range of the Baltic Proper harbour porpoise population over time, maps and histograms will be produced for specific basins or sub-basins. Historical data will be compared to current information, including the most recent information on distribution and abundance from the SAMBAH project, and any published information from national monitoring programs.

In order to attempt to quantify changes in effort, and the likelihood of reports of harbour porpoises being received, the existence and start date of any strandings program or incidental sightings reporting system within the Baltic Sea in each country will also be described [If you have any information on such dates and websites/organisations in your country please send us the information to fill in the below table- this includes information that no site/app exists in your country].

Country	Data host, web site	Strandings/dead animals	Incidental live sightings	Date started - ended
Denmark				
Estonia				
Finland				
Germany	DMM			
	http://www.schweinswale.com/	Yes	Yes	1987 - XXXX
Poland				
Latvia				
Lithuania				
Russia				

Sweden	Swedish Museum of Natural History, www.nrm.se/tumlare	Yes	Yes	4 July 2003 - ongoing
	SLU Swedish Species Information Centre	Yes	Yes	XXX - ongoing
All	HELCOM/ASCOBANS database	Yes	Yes	2004-ongoing

The assessment has been carried out on the population level, and applied on all HELCOM sub-basins overlapping with the management range of the Baltic Proper harbour porpoise population, i.e. the Arkona basin and eastwards.

Assessment units

This qualitative assessment evaluates the distribution and abundance of the Baltic Proper harbour porpoise population using HELCOM assessment unit scale 2 (division of the Baltic Sea into 17 sub-basins). The assessment units are defined in the HELCOM Monitoring and Assessment Strategy Annex 4.

Relevance of the qualitative assessment

Biodiversity assessment

The status of biodiversity is assessed using several core indicators together with this qualitative assessment. Each indicator focuses on one important aspect of the complex issue. In addition to providing a qualitative assessment of the abundance and distribution of the Baltic Proper harbour porpoise, this assessment, along with the biodiversity core indicators, will also contribute to the next overall biodiversity assessment (to be completed in 2023).

Policy relevance

The qualitative assessment on the abundance and distribution of the Baltic Proper harbour porpoise addresses the Baltic Sea Action Plan's (BSAP) overall goal of a favourable conservation status of Baltic Sea biodiversity, specifically the ecological objective of 'Viable populations of species'. This qualitative assessment is related to the targets:

- 'By 2021 all elements of the marine food webs, to the extent that they are known, occur at natural and robust abundance and diversity'
- 'By 2015, improved conservation status of species included in the HELCOM lists of threatened and/or declining species and habitats of the Baltic Sea area, with the final target to reach and ensure favourable conservation status of all species'.

The qualitative assessment has relevance to the HELCOM Recommendation 17/2 (https://helcom.fi/media/recommendations/Rec-17-2_revised-2020.pdf) and HELCOM Recommendation 37/2 (https://www.helcom.fi/wp-content/uploads/2019/06/Rec-37-2.pdf), where the Baltic Sea States have agreed to protect the harbour porpoise in the Baltic marine area. In 2020, the Contracting Parties to HELCOM adopted an amended version of Recommendation 17/2.

The qualitative assessment also addresses the following qualitative descriptors of the MSFD for determining good environmental status (European Commission 2008):

- Descriptor 1: 'Biological diversity is maintained. The quality and occurrence of habitats and the distribution and abundance of species are in line with prevailing physiographic, geographic and climatic conditions' and
- Descriptor 4: 'All elements of the marine food webs, to the extent that they are known, occur at normal abundance and diversity and levels capable of ensuring the long-term abundance of the species and the retention of their full reproductive capacity' and,
- Descriptor 8: 'Concentrations of contaminants are at levels not giving rise to pollution effects'
- Descriptor 11: 'Introduction of energy, including underwater noise, is at levels that do not adversely affect the marine environment'

Specifically, the qualitative assessment primarily addresses the following criteria of the MSFD:

- D1 Biodiversity
    - D1C2 (Population abundance)

  - D1C4 (Species distribution range and pattern)

In addition, the qualitative assessment addresses some secondary links to:

- D1 Biodiversity
  - D1C1 (Incidental by-catch)
  - D1C3 (Population demographic characteristics)
  - D1C5 (Habitat extent and condition)
- D4 Food webs
  - D4C1 (Diversity of trophic guild)
  - D4C2 (Balance of abundance between the trophic guilds)
  - D4C4 (Productivity of the trophic guild)
- D8 Contaminants
  - D8C2 (Health of species and condition of habitats)
  - D8C4 (Significant acute pollution events)
- D11 Energy and underwater noise
  - D11C1 (Spatial distribution, temporal extent of impulsive noise)
  - D11C2 (Spatial distribution, temporal extent of continuous noise)

The qualitative assessment is also highly relevant to the implementation of the Habitats Directive (HD, 92/43/EEC). Additionally, the qualitative assessment is of relevance to the ASCOBANS Recovery Plan for Baltic Harbour Porpoises (Jastarnia Plan), and EU and BALTFISH decisions surrounding Special Request Advice on emergency measures to prevent bycatch of the Baltic Proper harbour porpoise published by ICES. There is also some relevance of this qualitative assessment to the EU Common Fisheries Policy (1380/2013) and the EU Maritime Spatial Planning Directive (2014/89/EU).

Role of the harbour porpoise in the ecosystem

Harbour porpoises are likely to have played an important role in the past functioning of the Baltic Sea ecosystem. However, it is highly unlikely that they fulfil this role currently, due to the low population abundance and critically endangered status, which means that the Baltic harbour porpoise is in fact ecologically extinct. The presence of top predators allows for natural control of the distribution, abundance, diversity, and health of their prey species, with harbour porpoises likely previously playing an important role in maintaining natural balance in the Baltic Sea ecosystem. Being a highly mobile species both horizontally over space and vertically over depth, harbour porpoises also likely played an important role in nutrient transfer across the Baltic Sea region. If not sure severely reduced, the species can also act as a good indicator of changes in the Baltic Sea ecosystem, as they are sensitive to changes at lower levels in the ecosystem and human induced pressures. One of the strongest threats to harbour porpoises is the risk of being bycaught in fishing gear, which results in direct mortality of individuals. Survival and fecundity can also be reduced by exposure to contaminants. Additionally, both impulsive and continuous underwater noise have negative influences on porpoises, ranging from behavioural disturbance that reduces the efficiency of foraging and communication, through to permanent injury and death. Harbour porpoises have high-energy requirements and must feed almost continuously to meet energy demands. This makes the species particularly susceptible to negative impacts from resource depletion and disturbance from human

presence. In populations that are healthy and not exposed to high levels of pressures, harbour porpoises have shown population increases of 9-10% per year. As the abundance of the Baltic Proper population is critically low, it is not influenced by density dependence issues. A level of growth (or a decline) significantly lower than the level of known possible population growth for the species indicates that there is likely something within the ecosystem that is restricting the population, and that human pressures may be causing an issue in the natural state of the Baltic Sea.

Human pressures linked to the indicator

There are a number of human pressures listed in Annex III of the MSFD that are linked to the qualitative assessment of the Baltic Proper harbour porpoise population. These include:

- **Biological features:**
    - **A description of the population dynamics, natural and actual range and status of species of marine mammals and reptiles occurring in the marine region or sub-region.** For harbour porpoises, this relates to porpoise distribution and abundance.
    - **Information on the structure of fish populations, including the abundance, distribution and age/size structure of the populations.** For harbour porpoises, this relates to prey availability and quality.
- **Biological disturbance: selective extraction of species, including incidental non-target catches (e.g. by commercial and recreational fishing).** For harbour porpoises, this relates to two distinct issues: 1) bycatch of the porpoises themselves resulting in direct mortality, and 2) reduction in the quality and quantity of prey resources due to competition with fisheries.
- **Other physical disturbance: Underwater noise (e.g. from shipping, underwater acoustic equipment), and marine litter.** For harbour porpoises, this includes both impulsive noise (short and powerful noise from sources such as seismic surveys, pile driving, and underwater explosions) as well as continuous noise (from sources such as shipping and wind farm operation). Marine litter (plastic) is also an issue for marine mammals that often results in mortality or reduced health. Ghost nets (lost or discarded fishing gear) can also result in direct mortality when animals become entangled.
- **Contamination by hazardous substances- Introduction of synthetic compounds and introduction of non-synthetic substances and compounds.** For harbour porpoises, high levels of contaminants have been shown to result in decreased fertility and increased mortality, particularly in calves that receive high levels of contaminants from their mother.
- **Physical and chemical features: annual and seasonal temperature regime and ice cover, current velocity, upwelling, wave exposure, mixing characteristics, turbidity, residence time.** For harbour porpoises this can relate to the influence of climate change resulting in warmer water and more dead zones in the Baltic Sea.

Monitoring Requirements

Monitoring methodology

The monitoring methodology is not relevant to this qualitative assessment. It will be described in the reports of the candidate indicators 'Abundance and population trends of harbour porpoises' and 'Distribution of harbour porpoises'.

Current monitoring

The current monitoring is not relevant to this qualitative assessment. It will be described in the reports of the candidate indicators 'Abundance and population trends of harbour porpoises' and 'Distribution of harbour porpoises'.

Description of optimal monitoring

The optimal monitoring is not relevant to this qualitative assessment. It will be described in the reports of the candidate indicators 'Abundance and population trends of harbour porpoises' and 'Distribution of harbour porpoises'.

Data and updating

Access and use

The data and resulting data products (tables, figures and maps) available on the indicator web page can be used freely given that the source is cited. The indicator should be cited as following:

HELCOM (2021/22) Qualitative assessment of the abundance and distribution of the Baltic Proper harbour porpoise. HELCOM core indicator report. Online. [Date Viewed], [Web link]. ISSN 2343-2543

Metadata

All data compiled for the qualitative assessment will be made available for the HELCOM/ASCOBANS Harbour porpoise database and HELCOM Biodiversity Database.

Contributors and references

Contributors

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Data contributors and people who have provided assistance: Ivar Jüssi, ProMare, Estonia; Aleksander Klauson, TalTech, Estonia; Elo Rasmann, Ministry of the Environment, Estonia; Olli Louisa, TUAS, Finland; Saulius Karalius, Lithuanian Sea Museum, Lithuania; Carl C. Kinze, Seals and Whales of Denmark, Denmark; Aistė Kubiliūtė, Environmental Protection Agency, Lithuania; Airita Brenča, University of Latvia, Latvia; Irina Trukhanova, Baltic Fund for Nature, Russia. [Not yet complete]

Archive

This version of the HELCOM qualitative assessment report was published in [month year]:

Qualitative assessment report – web-based version [month year] (pdf)

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Additional relevant publications

[to be added if relevant]

HELCOM core indicator report, ISSN 2343-2543

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