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Monitoring programme: Biodiversity - Mammals

Programme topic: Mammals

## SUB-PROGRAMME: SEAL ABUNDANCE

*Updated on 15 June 2016*

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### REGIONAL COORDINATION

The monitoring of this sub-programme is: **partly coordinated** within HELCOM SEAL *ad hoc* expert group.

- [Common monitoring guidelines](#)
- Common quality assurance programme: missing. National QA/QC exists.
- Common database: expected to be ready in late-2016.

### PURPOSE OF MONITORING (Q4K)

Follow up of progress towards:

<b>Baltic Sea Action Plan (BSAP)</b>	Segments	Biodiversity
	Ecological objectives	Viable populations of species
<b>Marine strategy framework directive (MSFD)</b>	Descriptors	D1 Biodiversity D4 Food webs
	Criteria ( <u>Q5a</u> )	1.1 Species distribution 1.2 Population size 1.3 Population condition 1.5 Habitat extent 4.3 Abundance/distribution of key trophic groups/species
	Features ( <u>Q5c</u> )	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 subregion.
<b>Other relevant legislation (<u>Q8a</u>)</b>	Habitats Directive	

Assessment of: (Q4k)Scale of data aggregation for assessments: (Q10a)

HELCOM assessment unit levels

State/Impacts	<b>X</b>	Temporal trends Spatial distribution State classification	1 - Baltic Sea	<b>X</b> (for grey seal)
Pressures			2 - Subbasins	<b>X</b> (for ringed seal and harbor seal)
Human activities causing the pressures			3 - Subbasins with coastal and offshore division	
Effectiveness of measures			4 - Subbasins with coastal WFD division	

**MONITORING CONCEPTS TABLE**

<b>Coordination</b>	<b>Elements</b> <u>Q9a (Q5c)</u>	<b>Parameter</b> <u>Q9a (Q5c)</u>	<b>Method</b> <u>Q9c, Q9d</u>	<b>QA/QC</b> <u>Q9e, 9f</u>	<b>Frequency</b> <u>Q9h, 9i</u>	<b>Spatial resolution</b> <u>Q9g, 9j</u>	<b>Link to HELCOM core indicators</b>	<b>Link to MSFD GES characteristics</b> <u>Q5b</u>	<b>Spatial scope</b> <u>Q4i</u>	<b>Monitoring started</b> <u>Q4h</u>	<b>CPs monitoring</b>
Through <a href="#">HELCOM Seal Expert Group</a>	Grey seal	Population size (abundance)  Species distributional range/pattern	Aerial surveys	National/ <a href="#">HELCOM Seal Expert Group</a>	Yearly	All haul outs	<a href="#">Population growth rate, abundance and distribution of marine mammals</a>	1.1.1 Distributional range  1.2.1 Population abundance	EEZ	2000 (1975 in SE)	SE, FI, EE, RU, DK
Through <a href="#">HELCOM Seal Expert Group</a>	Ringed seal	Population size (abundance)  Species distributional range/pattern	Aerial surveys	National/ <a href="#">HELCOM Seal Expert Group</a>	Yearly	Entire distribution	<a href="#">Population growth rate, abundance and distribution of marine mammals</a>	1.1.1 Distributional range  1.2.1 Population abundance	EEZ	1988/1996	SE, FI, EE, RU
Through <a href="#">HELCOM Seal Expert Group</a>	Harbour seal/ Kalmarsund	Population size (abundance)  Species distributional range/pattern	Aerial surveys	National/ <a href="#">HELCOM Seal Expert Group</a>	Yearly	Entire distribution	<a href="#">Population growth rate, abundance and distribution of marine mammals</a>	1.1.1 Distributional range  1.2.1 Population abundance	EEZ	1972	SE

Through <u>HELCOM Seal Expert Group</u>	Harbour seal S. Baltic	Population size (abundance)  Species distributional range/patter n	Aerial surveys	<u>National/HELCOM Seal Expert Group</u>	Yearly	Entire distribution	<u>Population growth rate, abundance and distribution of marine mammals</u>	1.1.1 Distributional range  1.2.1 Population abundance	Territorial waters	1979	SE, DK
Through <u>HELCOM Seal Expert Group</u>	Harbour seal/Kattegat	Population size (abundance) Species distributional range/patter n	Aerial surveys	<u>National/HELCOM Seal Expert Group</u>	Yearly	Entire population	<u>Population growth rate, abundance and distribution of marine mammals</u>	1.1.1 Distributional range  1.2.1 Population abundance	EEZ	1979	SE, DK
National	Grey seal cubs	Population size (abundance)	National	<u>National/HELCOM Seal Expert Group</u>	Yearly	Archipelago Sea	-	4.1 Productivity (production per unit biomass) of key species or thophic groups	Territorial Waters	2006	EE, FI

## Brief description of monitoring

Detailed information on monitoring frequency and spatial resolution has not yet been collected from all countries but will be added.

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Element / parameter

**Grey seal/Abundance and distribution**  
**Ringed seal/Abundance and distribution**  
**Harbour seal/Abundance and distribution**

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<b>Method</b>	<p>All monitoring is conducted from aircrafts, except for a few locations where boat or land-based counting are better options. Seal haul-outs are monitored with cameras and the number of seals on the photographs are subsequently analysed by computers. Surveys are conducted annually during the moult and in some cases pupping seasons are surveyed. Deviations and detailed methodology are described in the <a href="#">monitoring.guidelines</a>.</p> <p>Grey seal/abundance and distribution: Fixed wing and helicopter, photos taken of all haul-outs annually. Two internationally coordinated surveys annually during peak moulting season.</p> <p>Ringed seal/abundance and distribution: Fixed wing, line transect over ice, covering a minimum of 13% of the ice covered area. Annual flights during peak moulting season in Bothnian Bay, more scarce in southern subpopulations. Gulf of Finland and Gulf of Riga: Due to poor ice conditions complementary counts on hauled out seals in August are planned.</p> <p>Harbour seal/Abundance and distribution: Fixed wing, all haul-outs photographed during the peak moulting season. Three flights carried out annually.</p>
<b>QA/QC</b>	<p>HELCOM Seal expert group coordinates and evaluates the data.</p>
<b>Frequency</b>	<p>Harbour seal/abundance and distribution: triple surveys carried out annually during moult in August covering the entire area of distribution.</p> <p>Grey seal/abundance and distribution: coordinated surveys in end of May-early June annually.</p> <p>Ringed seal/abundance and distribution: annual line transect surveys in the Bothnian Bay and Archipelago Sea, sporadic in the Gulf of Finland and the Gulf of Riga. Archipelago Sea, Gulf of Finland and Estonian coastal waters only monitored under ice conditions.</p>
<b>Spatial Scope</b>	<p>The programme covers the haul-out range of each seal species within the HELCOM area.</p>
<b>Spatial resolution</b>	<p>Kattegat, Great Belt, The Sound, Kiel Bay, Bay of Mecklenburg, Arkona Basin, Bornholm Basin, Eastern Gotland Basin, Western Gotland Basin, Gulf of Riga, Northern Baltic Proper, Gulf of Finland, Åland Sea, Bothnian Sea, The Quark, Bothnian Bay.</p> <p>For grey seals and harbour seals all significant seal haul-outs are covered.</p> <p>For ringed seals, at least 13% of the ice-covered sea area is monitored.</p>

## ASSESSMENT REQUIREMENTS

### Monitoring requirements and gaps

Monitoring is to be carried out to fulfill assessment requirements of HELCOM ecological objectives that are specified through HELCOM core indicators. The requirements on monitoring can include number of stations, the sampling frequency and replication.

#### **Monitoring requirements**

To assess seal abundance and trends over 5-year periods, annual surveys of each management unit are required to obtain the necessary power of detection. The survey efforts must be coordinated internationally to ensure that every management unit is surveyed by simultaneous surveys covering its range of distribution. The aerial surveys only contribute distribution data on land distribution. In order to obtain distribution at sea data for seals, other measures, such as periodical telemetry studies must be implemented.

#### **Gaps**

The grey seal range is expanding, and minor localities in Germany and Poland are not covered by the current programme. While currently insignificant in regard to the general abundance, they may grow to become significant in the future. In Denmark, the grey seals are only surveyed once during the moulting season, while each locality is surveyed twice in Sweden, Finland, Russia and Estonia. This makes the counts from Denmark less robust.

Warmer winters in recent years have resulted in reduced ice cover, making estimates in such years unreliable. This compromises the power to detect trends and calls for design of alternative methods.

With the current methodology, absolute abundances cannot be estimated for any of the species, as correction factors taking into account the proportion of the population that is hauled out during the surveys do not exist for any of the species in the Baltic. Studies to address this gap need to be performed.

Data for ringed seal southern populations is insufficient due to poor ice conditions. Alternative methods are being developed.

### Adequacy for assessment of GES (Q5d)

Monitoring should provide adequate data and information to enable the periodic assessment of environmental status, and distance from and progress towards GES as required by MSFD under Article 9 and 11.

#### **Adequate data?**

Yes for grey seal and harbor seal. Insufficient for ringed seals in the Gulf of Finland and Gulf of Riga.

#### **Established methods for assessment?**

Yes. Alternative methods are developed as needed.

#### **Adequate understanding of GES?**

Yes

<b>Adequate capacity to perform assessments?</b>	Yes
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### Assessment of natural variability (Q5e)

Quantitative and Qualitative. Population trends are achieved by the time series of seal counts. Analyses are exemplified in Teilmann et al. 2010.

### DATA PROVIDERS AND ACCESS

<b>Data access point</b>	<u>HELCOM Seal Expert Group</u>
<b>Data type (Q10c)</b>	Processed Data sets
<b>Data availability (Q10c)</b>	<u>HELCOM</u>
<b>Data access (Q10c)</b>	Open access
<b>INSPIRE standard (Q10c)</b>	Species distribution
<b>When will data become available? (Q10c)</b>	03/2015
<b>Data update frequency (Q10c)</b>	Yearly, or as soon as data have been analysed and quality assured
<b>Describe how the data and information from the programme will be made accessible to the EC/EEA</b>	
<b>Contact points in the Contracting Parties</b>	Contact point to national monitoring programmes will be added
<b>Has the data been used in HELCOM assessments?</b>	Yes, e.g. <u>BSEP116B</u> Biodiversity in the Baltic Sea.

### REFERENCES

Teilmann J., Riget F., Härkönen T. 2010. Optimising survey design in Scandinavian harbour seals: Population trend as an ecological quality element. *ICES Journal of Marine Science*, 67: 952–958.

Härkönen T., Stenman O., Jüssi M., Jüssi I., Sagitov R., Verevkin M. 1998. Population size and distribution of the Baltic ringed seal (*Phoca hispida botnica*). In: *Ringed Seals (Phoca hispida) in the North Atlantic*. Edited by C.Lydersen and M.P. Heide-Jørgensen. NAMMCO Scientific Publications, Vol. 1, 167-180.

Härkönen T. and Lunneryd S.G. 1992. Estimating abundance of ringed seals in the Bothnian Bay. *Ambio* 21:497-510.

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