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Zooplankton species composition, abundance and biomass

Monitoring programme: Eutrophication, Biodiversity - Water column habitats  
Programme topic: Zooplankton

## SUB-PROGRAMME: ZOOPLANKTON SPECIES COMPOSITION, ABUNDANCE AND BIOMASS

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### REGIONAL COORDINATION

The monitoring of this sub-programme is: **partly coordinated**. Coordinated monitoring is developed by the ZEN QAI project that partially addresses quality assurance work in zooplankton analysis.

- Common monitoring guidelines: [mesozooplankton](#), [HELCOM COMBINE manual](#).
- Common quality assurance programme: missing
- Common database: missing. Data are hosted by analyzing laboratories and national databases. Submission of data to ICES database is not always a requirement.

**PURPOSE OF MONITORING (Q4K)**

Follow up of progress towards:

<b>Baltic Sea Action Plan (BSAP)</b>	Segments	Biodiversity Eutrophication
	Ecological objectives	Natural distribution and occurrence of plants and animals
<b>Marine strategy framework directive (MSFD)</b>	Descriptors	D1 Biodiversity D2 Non-indigenous species D4 Food webs
	Criteria (Q5a)	1.6 Habitat condition 1.7 Ecosystem structure 2.1 Abundance and state characterisation of non-indigenous species, in particular invasive species 4.3 Abundance/distribution of key trophic groups/species
	Features (Q5c)	Biological features: A description of the biological communities associated with the predominant seabed and water column habitats.
<b>Other relevant legislation (Q8a)</b>	Habitats Directive	

**Assessment of: (Q4k)**

State/Impacts	<b>X</b>	temporal trends, spatial distribution, status classification
Pressures		
Human activities causing the pressures		
Effectiveness of measures		

**Scale of data aggregation for assessments: (Q10a)**

HELCOM assessment unit Level 1: Baltic Sea	
HELCOM assessment unit Level 2: Subbasin	
HELCOM assessment unit Level 3: Subbasins with coastal and offshore division	<b>X</b>
HELCOM assessment unit Level 4: Subbasins with coastal WFD division	

**MONITORING CONCEPTS TABLE**

<b>Coordination</b>	<b>Elements</b> <a href="#">Q9a</a> ( <a href="#">Q5c</a> )	<b>Parameter</b> <a href="#">Q9a</a> ( <a href="#">Q5c</a> )	<b>Method</b> <a href="#">Q9c</a> , <a href="#">Q9d</a>	<b>QA/QC</b> <a href="#">Q9e</a> , <a href="#">9f</a>	<b>Frequency</b> <a href="#">Q9h</a> , <a href="#">9i</a>	<b>Spatial resolution</b> <a href="#">Q9g</a> , <a href="#">9j</a>	<b>Link to HELCOM core indicators</b>	<b>Link to MSFD GES characteristics</b> <a href="#">Q5b</a>	<b>Spatial scope</b> <a href="#">Q4i</a>	<b>Monitoring started</b> <a href="#">Q4h</a>	<b>CPs monitoring</b>
Regional COMBINE	Zooplankton	Species abundance (numbers or cover)	Microscopic counting	<a href="#">HELCOM COMBINE manual</a>	<a href="#">See map for details</a>	Varies among countries, <a href="#">See map for details</a>	<a href="#">Zooplankton mean size and total abundance</a>	1.6.2 Relative abundance and/or biomass	EEZ	Varies among countries from 1976 to 2004	All HELCOM Contracting Parties
Regional COMBINE	Zooplankton	Species abundance (biomass)	Individual weight factors and abundance; length-weight regressions	<a href="#">HELCOM COMBINE manual</a>	<a href="#">See map for details</a>	Varies among countries, <a href="#">See map for details</a>	<a href="#">Zooplankton mean size and total abundance</a>	1.6.2 Relative abundance and/or biomass	EEZ	Varies among countries from 1976 to 2004	All HELCOM Contracting Parties
Regional COMBINE	Zooplankton	Species present (whole community or selected species only)	Taxonomic list is under revision by ZEN	Other	<a href="#">See map for details</a>	Varies among countries, <a href="#">See map for details</a>	<a href="#">Zooplankton mean size and total abundance</a>	1.6.1 Condition of the typical species and communities	EEZ	Varies among countries from 1976 to 2004	All HELCOM Contracting Parties

**Brief description of monitoring**

Full description in [HELCOM COMBINE manual](#). Detailed information on monitoring frequency and spatial resolution has not yet been collected from all countries but will be added.

**Element / parameter****Zooplankton / Species abundance** (number)**Zooplankton / Species abundance** (biomass)**Zooplankton / Species present** (whole community), pan-Baltic species list was revised by [HELCOM ZEN-QAI project](#)

<b>Method</b>	Vertical column sampling, Gear: WP2, 100µm (90µm), formalin preservation, Kott subsampling, Stempel pipett, Counting at 40x to 80x magnification (varies among laboratories).
<b>QA/QC</b>	Ring tests (see HELCOM ZEN QAI reports for 2011 and 2012), Inter-and intra-laboratory calibrations, Accreditation procedures facilitating QA. An unresolved area with respect to QA is data quality control when submitting to a database host.
<b>Frequency</b>	Varies from 1-2 to 24 samples/station/year, depending on country.
<b>Spatial Scope</b>	Varies among countries, <a href="#">See map for details</a>
<b>Spatial resolution</b>	Vertical resolution varies among the sampling stations depending on bottom depth: (1) bottom to surface, (2) bottom to halocline, halocline to thermocline, thermocline to surface, (3) bottom to thermocline, thermocline to surface, (4) discrete depth layers (e.g. 100-60 m, 60-30 m, 30-0 m).

## 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.

<b>Monitoring requirements</b>	Currently there is a study coordinated by Estonia to statistically test how the sampling frequency affects the usability of data for different purposes e.g. detection of long-term trends in different taxa, in population dynamics and also for indicator purposes. The HELCOM core indicator ' <a href="#">Zooplankton mean size and total abundance</a> ' is proposed to be tested. Generally, current monitoring might be sufficient if sampling frequency is at least monthly.
<b>Gaps</b>	<p>Better individual biomass assessment would increase the indicator reliability since using length or other individual size measurements would provide a more realistic biomass values compared to the fixed individual weight values. This is related to seasonal and geographic variability in body size. Also, regular intercalibrations of sample analysis (Ring-tests) would facilitate the interlaboratory comparisons.</p> <p>Harmonization of sampling frequency and spatial resolution among the national monitoring programmes is needed to improve indicator-based assessment across the Baltic Sea and to increase coherency of GES targets.</p>

### 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.

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**Adequate data?**

It depends on the variability in, for example, sampling frequency among the analyzing laboratories and, importantly, on the length of the long-term data series that are important for establishing GES. In some areas (= stations) the data sets are sufficiently long and taken with high frequency. For those monitoring programmes, the answer would be YES. In others, the data go back only a few years and since GES values are area-specific, it would be a NO.

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**Established methods for assessment?**


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**Adequate understanding of GES?**


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**Adequate capacity to perform assessments?**


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## Assessment of natural variability (Q5e)

Quantitative. The natural variability is estimated using control charts and long-term data sets.

## DATA PROVIDERS AND ACCESS

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<b>Data access point</b>	ICES, COMBINE, SMHI, National Data Centres.
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<b>Data type (Q10c)</b>	Processed datasets
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<b>Data availability (Q10c)</b>	<u>ICES Database</u>
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<b>Data access (Q10c)</b>	Open access
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<b>INSPIRE standard (Q10c)</b>	
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<b>When will data become available? (Q10c)</b>	Annually
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<b>Data update frequency (Q10c)</b>	Yearly
<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

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## REFERENCES

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