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Monitoring programme: Biodiversity - Seabed habitats
Programme topic: Seabed habitat distribution and extent

SUB-PROGRAMME: HABITAT-FORMING SPECIES AND SUBSTRATES

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REGIONAL COORDINATION

The monitoring of this sub-programme is: **partly coordinated**.

- Common monitoring guidelines: Partly in [HELCOM COMBINE manual](#) and also national.
- Common quality assurance programme: Partly in [HELCOM COMBINE manual](#) and also national.
- Common database: missing.

PURPOSE OF MONITORING (Q4K)

Follow up of progress towards:

Baltic Sea Action Plan (BSAP)	Segments	Biodiversity
	Ecological objectives	Natural landscapes and seascapes
Marine strategy framework directive (MSFD)	Descriptors	D1 Biodiversity D6 Seafloor integrity
	Criteria (<u>Q5a</u>)	1.4 Habitat distribution 1.5 Habitat extent 1.6 Habitat condition 6.1 Physical damage, having regard to substrate characteristics 6.2 Condition of benthic community
	Features (<u>Q5c</u>)	Physical and chemical features: Topography and bathymetry of the seabed Habitat types: The predominant seabed and water column habitat type(s) with a description of the characteristic physical and chemical features, such as depth, water temperature regime, currents and other water movements, salinity, structure and substrata composition of the seabed. Identification and mapping of special habitat types, especially those recognized or identified under Community legislation (the Habitats Directive and the Birds Directive) or international conventions as being of special scientific or biodiversity interest. Habitats in areas which by virtue of their characteristics, location or strategic importance merit a particular reference.
Other relevant legislation (<u>Q8a</u>)	Habitats Directive Water Framework Directive	

Assessment of: (Q4k)

State/Impacts	X	spatial distribution, state 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	X
HELCOM assessment unit Level 4: Subbasins with coastal WFD division	X

MONITORING CONCEPTS TABLE

Coordination	Elements <u>Q9a</u> (<u>Q5c</u>)	Parameter <u>Q9a</u> (<u>Q5c</u>)	Method <u>Q9c</u> , <u>Q9d</u>	QA/QC <u>Q9e</u> , <u>9f</u>	Frequency <u>Q9h</u> , <u>9i</u>	Spatial resolution <u>Q9g</u> , <u>9i</u>	Link to HELCOM core indicators	Link to MSFD GES characteristics <u>Q5b</u>	Spatial scope <u>Q4i</u>	Monitoring started <u>Q4h</u>	CPs monitoring
National	Macroalgae (e.g. <i>Fucus vesiculosus</i>)	Species abundance (numbers or cover)	Drop-video mapping and verifying transects by divers.	National			Distribution, pattern and extent of benthic biotopes	<u>1.1.1</u> ; <u>1.4</u> ; <u>1.5</u> ; <u>1.6.2</u> ; <u>5.2.3</u> ; <u>5.3.1</u> ; <u>6.2.2</u>			
National	Angiosperms (<i>Zostera</i> and others)	Species distributional range/pattern	Assessment of depth limits by video recording or diving along transects	National			Distribution, pattern and extent of benthic biotopes	<u>1.1.1</u> ; <u>1.4</u> ; <u>1.5</u> ; <u>1.6.2</u> ; <u>5.2.3</u> ; <u>5.3.1</u> ; <u>6.2.2</u>			

Regional (COMBINE)	Soft-bottom macrofauna	Population size (abundance)	HELCOM COMBINE manual, <u>Part C,</u> <u>Annex C8</u>	<u>HELCOM</u> <u>COMBINE</u> <u>manual</u>	Annual	3-10 offshore stations per sub- basin and 3-10 stations per coastal water type.	Distribution, pattern and extent of benthic biotopes	<u>1.1.1; 1.4; 1.5; 1.6.2;</u> <u>5.2.3; 5.3.1; 6.2.2</u>	EEZ	1965	All HELCOM Contracting Parties
National	Geological substrate	Coverage, extent and pattern of substrates			Regularly				EEZ		All HELCOM Contracting Parties

Brief description of monitoring

Full description on monitoring, some of the relevant parameters, such as macrozoobenthos, in HELCOM COMBINE manual. Detailed information on monitoring frequency and spatial resolution has not yet been collected from all countries, but the information will be added.

Element / parameter	Macroalgae / Species abundance Angiosperms / Species distribution Soft-bottom macrofauna / Population size
Method	Drop video mapping, diving and the <u>HELCOM COMBINE manual</u> . Information on SE methods currently being used in the national MSFD Article 11 report (sub-programme Makrovegetation): https://www.havochvatten.se/download/18.203ea9d8149410b71c24d73b/1415008228827/rapport-2014-20-god-havsmiljo-2020-del-3-overvakningsprogram.pdf
QA/QC	National and <u>HELCOM COMBINE manual</u>
Frequency	Estonia: yearly in 4 areas, at least once in 6 years in another 12 areas; monitoring started in 1995.
Spatial Scope	-

Spatial resolution	Estonia: spatial resolution - coastal waters WFD division - at least 3 transects in each surface water body
Element / parameter	Macroalgae by drop videos / Macroalgae by drop videos
Method	In Finland the monitoring has not started, however baseline mapping of the macroalgae distribution by drop video, diver transects and modeling has been carried out since 2004. The method for monitoring has been suggested.
QA/QC	National
Frequency	Estonia: yearly in 4 areas, at least once in 6 years in another 12 areas; monitoring started in 1995.
Spatial Scope	Mainly territorial waters but also in offshore areas.
Spatial resolution	Estonia: spatial resolution - coastal waters WFD division - at least 3 transects in each surface water body

Element / parameter	Angiosperms by drop videos / Angiosperms by drop videos
Method	In Finland the monitoring has not started, however baseline mapping of the angiosperm distribution by drop video, diver transects and modeling has been carried out since 2004. The method for monitoring has been suggested.
QA/QC	National
Frequency	-
Spatial Scope	Mainly territorial waters but also in offshore areas
Spatial resolution	-

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

The HELCOM core indicators directly linked to the sub-programme are still at a pre-core indicator stage of development. Creating specifications for monitoring requirements is a part of the development work of the indicators.

The monitoring of habitat-forming species and substrates focuses on covering wide sea areas with the purpose of providing data on extent and distribution. However, the data can also include parameters that enable state classification based on the condition of habitat-forming species. Monitoring of extent and distribution of habitat-forming species and substrates, require spatial methods such as drop video, aerial surveys (aeroplanes, satellites, remote helicopters), multiple diving transects, randomized grab samples, multibeam sonars or different combinations of these methods. As the primary focus of monitoring is not in detecting temporal change but spatial status (at certain time intervals), the monitoring frequency can be every 3 to 6 years.

The quality and quantity dimensions of habitat change are traditionally considered when assessing the status of habitats. There are hardly any operational methods used to estimate the quantity of a selected habitat that would also be useful for monitoring habitat extent (area or volume). To monitor habitat extent and describe the change of habitat extent or size statistically, methods that fully cover selected areas, delineate habitat boundaries, or use a large number of point observations may be used. There are several examples of methods that could qualify for this type of monitoring, including those applied on seagrass meadows being repeatedly mapped using aqua scope, video or remote sensing.

Although benthic monitoring for macrofauna and macrophytes is carried out within the COMBINE monitoring, no coordinated monitoring for habitat distribution and extent currently exists. Joint methods and guidelines will need to be agreed upon to provide data for the core indicators.

Gaps	<p>There is very little monitoring data on the distribution of habitat-forming species currently available, whereas station or transect-based monitoring of the specific species is carried out in all the Baltic Sea countries. The latter cannot be directly used for assessing extent and distribution, as the monitoring is primarily designed to follow changes in habitat condition in specific locations.</p> <p>Periodically mapping the bathymetry and distribution of geological substrates is included in monitoring/inventory programmes in all the countries.</p> <p>No commonly agreed monitoring methods are in place, which target the extent and quality of the benthic habitats in the Baltic Sea. The 'drop-video' technique in combination with traditional methods used for characterizing benthic communities (grab sampling, SCUBA diving) could be a promising and cost-effective solution at least for certain habitats. The need for joint and standardized monitoring methods/guidelines in the whole Baltic Sea area should be discussed and agreed, considering the diversity of natural conditions, environmental gradients as well as different reporting obligations.</p>
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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?	No
Established methods for assessment?	No
Adequate understanding of GES?	No
Adequate capacity to perform assessments?	No

Assessment of natural variability (Q5e)

Qualitative. The borders of habitats and biotopes are naturally a continuum, which must be considered when assessing the distribution, extent and pattern of a biotope.

DATA PROVIDERS AND ACCESS

Data access point	National databases
Data type (Q10c)	Processed datasets
Data availability (Q10c)	By request
Data access (Q10c)	
INSPIRE standard (Q10c)	Habitats and Biotopes
When will data become available? (Q10c)	Species data available, but data on habitat distribution and extent missing
Data update frequency (Q10c)	Yearly
Describe how the data and information from the programme will be made accessible to the EC/EEA	
Contact points in the Contracting parties	Contact point to national monitoring programmes will be added
Has the data been used in HELCOM assessments?	Yes - species data

REFERENCES

[HELCOM \(2013\) HELCOM Underwater Biotope and habitat classification system \(HELCOM HUB\).](#)

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