BIOTOPE INFORMATION SHEET

English name: **Baltic photic or aphotic coarse sediment or sand dominated by multiple infaunal bivalve species: Macoma calcarea, Mya truncata, Astarte spp., Spisula spp.**		Code in HELCOM HUB: **AA.I3L10, AA.J3L10, AB.I3L10, AB.J3L10**	
Characteristic species: *Macoma calcarea, Mya truncata, Astarte spp., Spisula spp.*			
Past and Current Threats (Habitat directive article 17): Eutrophication (H01.05)		Future Threats (Habitat directive article 17): Eutrophication (H01.05)	
Red List Criteria: **A1**	Confidence of threat assessment: **L**	**HELCOM Red List Category:**	**NT Near Threatened**
Previous HELCOM Red List threat assessments			
BSEP 75 (1998): "3" Endangered: 2.4.1 Gravel bottoms of the aphotic zone 2.4.2.1 Sublittoral gravel bottoms with little or no macropyte vegetation of the photic zone 2.4.2.3 Sublittoral gravel banks of the photic zone with or without macrophyte vegetation 2.4.3.1 Hydrolittoral level gravel bottoms with little or no macrophyte vegetation 2.4.3.3 Hydrolittoral gravel banks with or without macrophyte vegetation 2.5.1 Sandy bottoms of the aphotic zone 2.5.2.1 Sublittoral level sandy bottoms with little or no macrophyte vegetation or the photic zone 2.5.2.3 Sand bars of the sublittoral zone 2.5.2.4 Sand banks of the sublittoral photic zone with or without macrophyte vegetation 2.5.3.1 Hydrolittoral level sandy bottoms with little or no macrophyte vegetation 2.5.3.4 Hydrolittoral sand banks with or without macrophyte vegetation		BSEP 113 (HELCOM 2007): *Mya truncata* is under threat and/or in decline in Bay of Mecklenburg, The Sound and Kattegat.	
Greater concern stated by:			

Habitat and Ecology

The substrate of this biotope is usually poorly sorted and contains different proportions of gravel, coarse or medium sand, but may also contain finer sediment fractions. It is mainly restricted to small patches between hard substrates on ridges formed by lag sediment and till (e.g. Fehmarnbelt) in the photic and aphotic zone. The biotope is only found at high salinities (> 18 psu) as all characteristic bivalves species are eumarin and do not accept lower salinities. The characteristic trait of the biotope is a high species diversity. Usually, none of the characteristic species is clearly dominant in an area. Due to the different sediment fractions and the interlocking with surrounding hard substrates, the benthic community combines high biodiversity and high biomass. The biomass of multiple infaunal bivalve species (*Macoma calcarea, Mya truncata, Astarte spp., Spisula* spp.*)* constitute at least 50 % of the biomass. The dominance structure might considerably vary between stations within the same patch and single large specimen of *Arctica islandica* might occasionally dominate at single spots.

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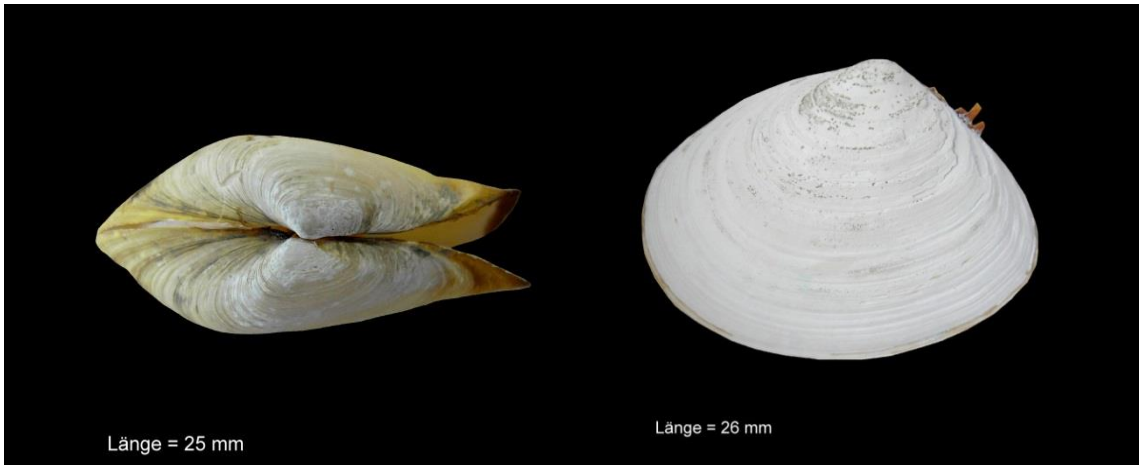
Mya truncata requires a salinity above 20 psu. This marine species is from time to time rare in the Belt Sea with maximum densities of 1-10 ind./m², but seems to recover recently (NT;A2c). Reproduction takes place from October to January; pelagic larvae. The species is relatively tolerant of periodic, temporary oxygen deficiency (HELCOM Website). The species occurs most often at depths between 10 and 30 meters (Moen & Svensen 2004).

Macoma calcarea (VU; A2c) is a deposit filter feeder with separate sexes and pelagic larvae. The species prefers fine sand or mud, often mixed with gravel. Currently this northern Atlantic arctic species is only found in the westen parts of the HELCOM area, it has disappeared from many sites in the Bornholm Basin and Eastern Gotland Basin due to oxygen depletion. The typical depth range of recent records vary from 15 to 30 meters.



Mya truncata (left) and *Macoma calcarea* (right) (Photo: Michael Zettler)

Astarte borealis is highly resistant to anoxic conditions. Ideal depth for *Astarte borealis* is typically from 10 to 23 meters. As an arctic-boreal species, *Astarte borealis* appears in these Baltic biotopes at its southern limit. *Astarte borealis* prefers sandy and mixed sediments and avoids muddy sediments (Zettler 2002). *Astarte elliptica* is frequently found in Kiel Bay in different sandy sediments below 15 m water depth.

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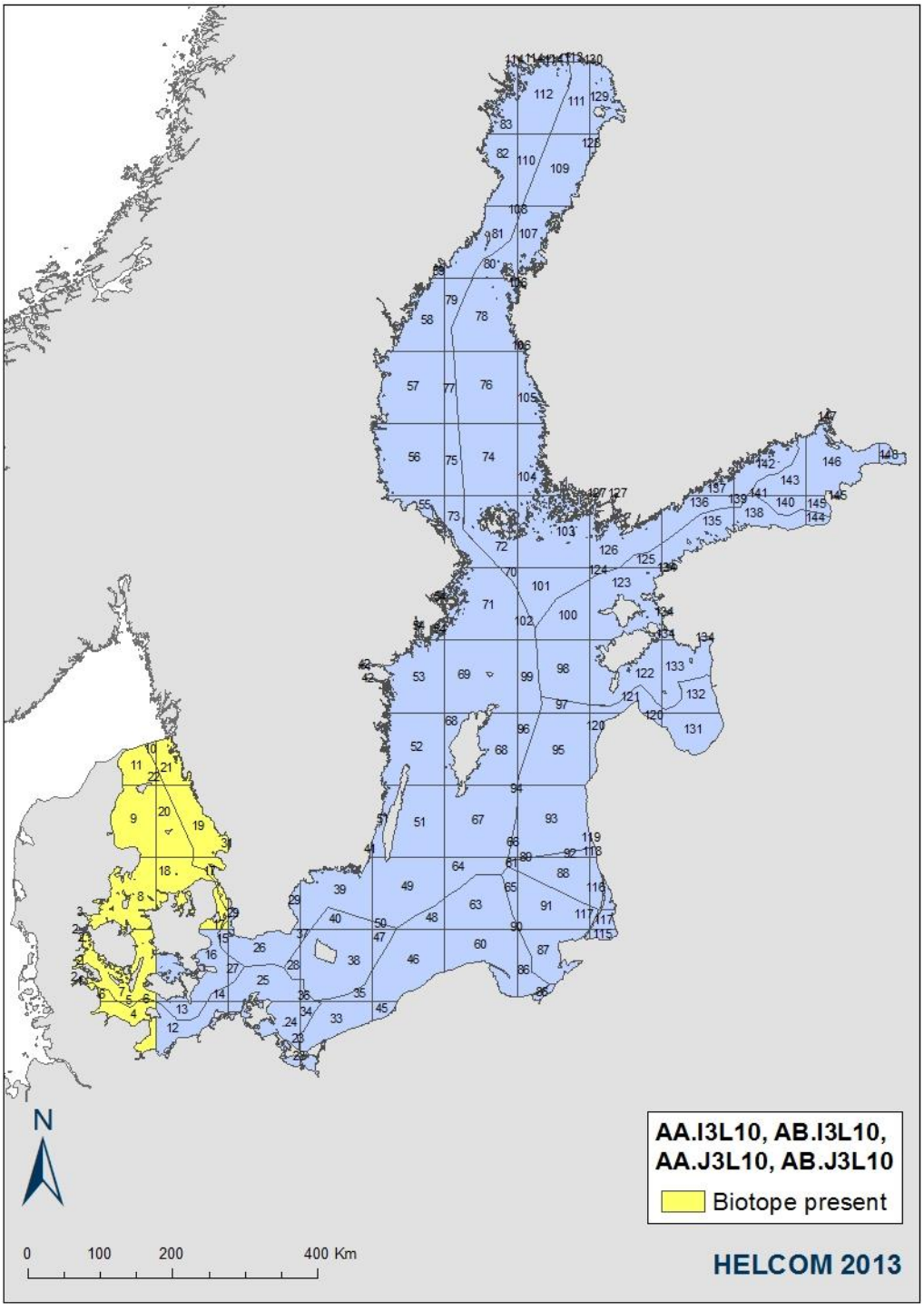
Distribution and status in the Baltic Sea region

Kiel bight to Isle of Fehmarn, might occasionally occur in Mecklenburg Bight to Darss sill, South-western Baltic Sea. The distribution map indicates the area in the 100 x 100 km grid where biotope is known to occur.



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Description of Major threats

Reasons for threat are oxygen deficiency often caused by eutrophication in combination with poor water exchange (HELCOM Website). The biotope is threatened by an increase in organic load mainly resulting from eutrophication that causes an increased growth rate in algae. The increase in planktonic phytoplankton increases the siltation rate.

Sources of increased siltation which threatens the biotope can also be found in various construction activities such as dredging and dumping. These activities result in a significant decrease in reproductive success and spread of the characteristic species which results in a loss of connectivity between populations of characteristic species. The biotope occurs relatively close to land. Therefore an increased siltation rate can also be traced back to changes in land use. Run-off from intensively farmed areas can transport organic and inorganic particles out to sea, increasing the siltation rate. Sand extraction and off-shore sand extraction destroys the substrate that the biotope occurs on.

Assessment justification

A1

It is assumed that habitat was lost due to sediment extraction and state was degraded by bottom trawling. The biotope is not widely distributed and depends on the state of its characteristic species. Functional loss occurred due to loss in connectivity and (main reason) organic load of the sediment (change in community structure).

Recommendations for actions to conserve the biotope

Mapping activities on the potential sandy areas where the biotope could potentially occur need to be carried out to identify the remaining occurrences. The area where the biotope occurs should be protected. In the protected areas bottom trawling and sediment extraction should be restricted. All activities that can improve the oxygen conditions through a reduction of eutrophication will support the conservation of the biotope.

Common names

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References

HELCOM Website
http://www.helcom.fi/environment2/biodiv/endangered/Invertebrates/en_GB/Mya_truncata/

Schiewer, U. 2008. Ecology of Baltic Coastal Waters. p. 12. Springer, Berlin, Germany.

Trutschelt, K., Samtleben, C. (1988). Shell growth of Astarte elliptica (Bivalvia) from Kiel Bay (Western Baltic Sea). Marine Ecology progress Series 42: 155–162.

Moen, F. E., Svensen, E. (2004). Marine fish & invertebrates of Northern Europe. KOM, Kristiansund. 608pp.

Zettler, M. (2002). Ecological and morphological features of the bivalve Astarte borealis (Schumacher 1817) in the Baltic Sea near its geographical range. Journal of Shellfish Research 21: 33–40.