

BIOTOPE INFORMATION SHEET

English name: Baltic aphotic muddy sediment dominated by <i>Monoporeia affinis</i> and/or <i>Pontoporeia femorata</i>		Code in HELCOM HUB: AB.H3N1	
Characteristic species: <i>Monoporeia affinis</i> , <i>Pontoporeia femorata</i> , <i>Saduria entomon</i>			
Past and Current Threats (Habitat directive article 17): Eutrophication (H01.05), Contaminant pollution (H03.02)		Future Threats (Habitat directive article 17): Eutrophication (H01.05), Contaminant pollution (H03.02)	
Red List Criteria: A1	Confidence of threat assessment: M	HELCOM Red List Category:	NT Near Threatened
Previous HELCOM Red List threat assessments			
BSEP 75 (1998): "3" (Endangered) 2.7.1 Muddy bottoms of the aphotic zone		BSEP 113 (HELCOM 2007): <i>Monoporeia affinis</i> is under threat and/or in decline in: Gulf of Finland, Gulf of Riga, The Northern Baltic Proper, The Southern Baltic Proper. <i>Pontoporeia femorata</i> is under threat and/or in decline in: Bay of Mecklenburg, Gulf of Finland, Gulf of Riga, The Northern Baltic Proper.	
Greater concern stated by:			

Habitat and Ecology

The biotope occurs mainly on the deep accumulation bottoms on where muddy sediments have a coverage of >90%. *Monoporeia affinis* and/or *Pontoporeia femorata* constitutes at least 50% of the biomass. The species diversity in *M. affinis* community is generally relatively high (Bonsdorff et al. 2003), but some offshore, deep communities have a lower diversity. *M. affinis* requires high oxygen concentrations and a good supply of detritus and algae for food (Bonsdorff et al 2003, Donner et al. 1987). The depth range of this biotope is 10–200 meters. Salinity is usually below 10 psu.



The amphipods *Monoporeia affinis* (left) and *Pontoporeia femorata* (right) (Photo: Ari Laine, Joanna Legeżyńska)

Monoporeia affinis is a small (<1 cm) deposit-feeding amphipod occurring in both fresh and brackish water environments. It occurs in most parts of the Baltic Sea on soft bottoms, and is one of the most ecologically important and dominant native species in the Baltic Sea benthic community at depths of

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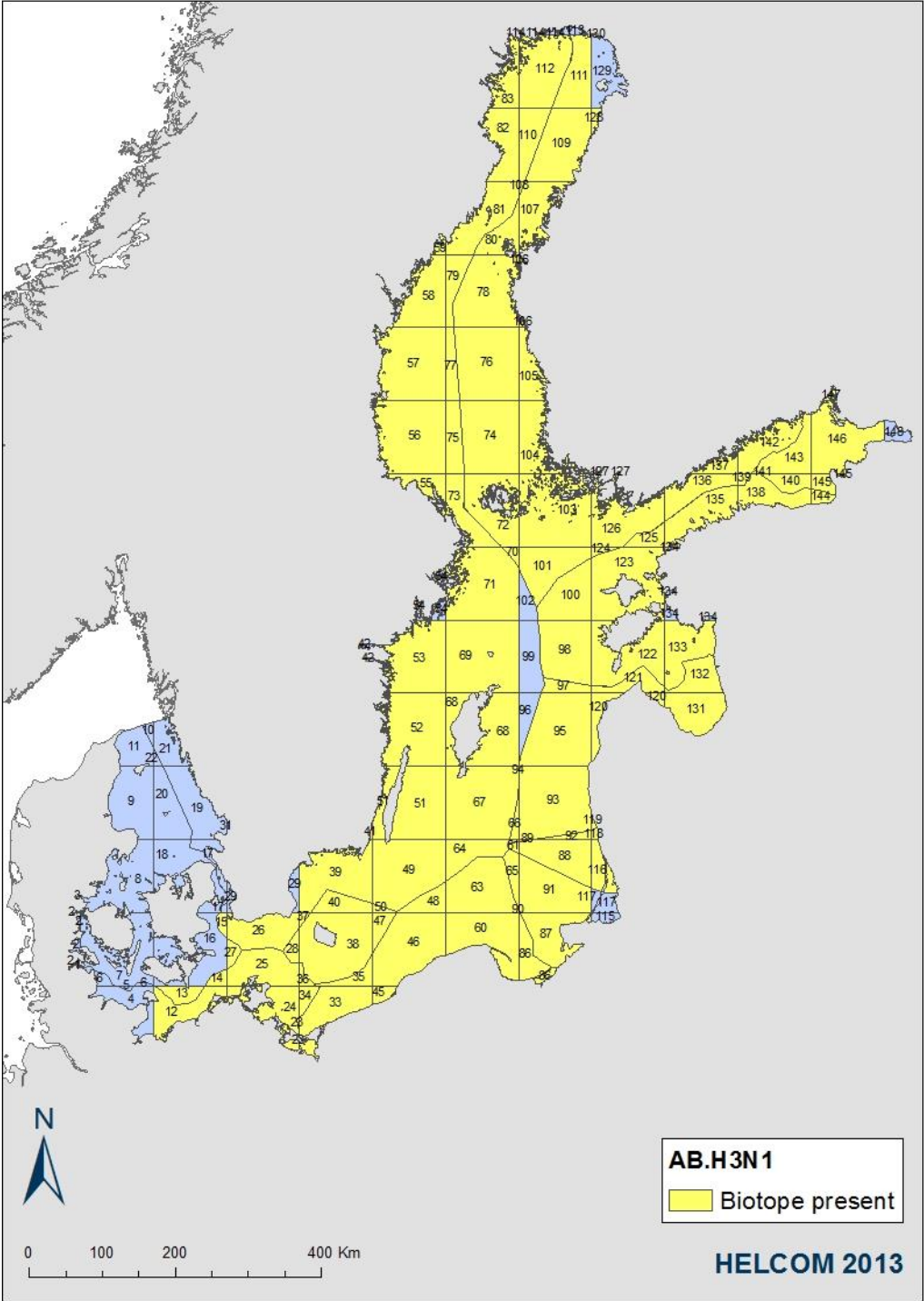
10–80 m (Bonsdorff et al. 2003, Donner et al. 1987). *M. affinis* is an important food source for several fish species, such as cod (*Gadus morhua*), herring (*Clupea harengus*), smelt (*Osmerus eperlanus*) and fourhorn sculpin (*Myoxocephalus quadricornis*) (Donner et al. 1987). *Pontoporeia famorata* prefers more marine conditions and does not tolerate the low salinities of the northernmost Baltic Sea (Leinikki et al. 2004).

In favorable conditions, *Monoporeia affinis* and *Pontoporeia femorata* can occur in great abundances, even several thousand species per square meter (Leinikki et al. 2004). Even though the two species have somewhat different salinity tolerance, they co-occur so often that it is not possible to separate two different biotopes. The isopod *Saduria entomon* often occurs in this biotope. *Saduria entomon* is not considered habitat forming since it is a mobile species that burrows into the sediment but also swims.

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Distribution and status in the Baltic Sea region

The distribution map indicates the area in the 100 x 100 km grid where biotope is known to occur based on field sampling data. While it is the dominant biotope in the deep muddy areas of the Baltic Proper, it only occasionally occurs in the southern Baltic as the communities are most often dominated by bivalve or large polychaet species.



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Description of Major threats

A major threat to this biotope is eutrophication leading to anoxia on the deep soft sediment bottoms where it occurs. *Monoporeia affinis* and *Pontoporeia femorata* are both sensitive to anoxia and can move to a new area when anoxia spreads. The crustacean dominated biotope may also be threatened by accumulation of various persistent hazardous substances in the soft sediments of the deep accumulation bottoms.

The further spread of the invasive polychaete species *Marenzelleria* spp. threatens the future persistence of the biotope. *Marenzelleria* spp. is a North-American detritus feeding polychaete. The polychaetes have invaded large areas of the Baltic Sea. Ballast water tanks in ships are the most likely vector for the first introduction of the species to the Baltic Sea. *Marenzelleria* spp. and *Monoporeia affinis* are believed to compete for resources, and the presence of the polychaete might reduce the growth rate of *Monoporeia affinis* (Kotta & Olafsson 2003). In laboratory experiments *M. affinis* avoids burrowing in sediments with high polychaete abundances. *Marenzelleria* spp. is tolerant of anoxic conditions giving it a better competitor if anoxia of the aphotic muddy sediments increases (Neideman et al. 2003).

Assessment justification

A1

The quantity of the biotope has decreased by >25% during the past 50 years. The spread of the polychaete worm *Marenzelleria* spp. is well documented in several sub-basins of the Baltic Sea. The increase in abundance of the polychaetes has co-occurred with a severe decrease in abundance of especially *Monoporeia affinis*. In the deep parts of the Baltic Proper the biotope has disappeared from large areas due to anoxic conditions.

Recommendations for actions to conserve the biotope

All actions to reduce the level of eutrophication on the scale of the whole Baltic Sea will benefit the biotope.

The invasive polychaete *Marenzelleria* spp. has affected the quantity of the biotope. Very little can be done to reduce the population of the polychaete worms in the Baltic Sea, but several measures can be taken to hinder the spread of new invasive species.

Common names

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References

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- Bonsdorff, E., Laine, A. O., Hänninen J., Vuorinen I. & Norkko A. 2003. Zoobenthos of the outer archipelago waters (N. Baltic Sea) - the importance of local conditions for spatial distribution patterns. *Boreal Environment Research* 8:135–145
- HELCOM 2007. HELCOM lists of threatened and/or declining species and biotopes/habitats in the Baltic Sea area. Baltic Sea Environmental Proceedings No. 113. Helsinki Commission, Helsinki. <http://www.helcom.fi/stc/files/Publications/Proceedings/bsep113.pdf>
- Kotta, J., Olafsson, E. (2003). Competition for food between the introduced polychaete *Marenzelleria viridis* (Verrill) and the native amphipod *Monoporeia affinis* Lindström in the Baltic Sea. *Journal of Sea Research* 50: 27-35.
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