

BIOTOPE INFORMATION SHEET

English name: Baltic photic muddy sediment dominated by Unionidae		Code in HELCOM HUB: AA.H3L6	
Characteristic species: Unionidae, <i>Unio tumidus</i> , Chironomidae larvae often co-occur			
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 (HELCOM 1998): Category "3" Endangered 2.7.3.1 Hydrolittoral muddy bottoms with little or no macrophyte vegetation		BSEP 113 (HELCOM 2007):	
Greater concern stated by:			

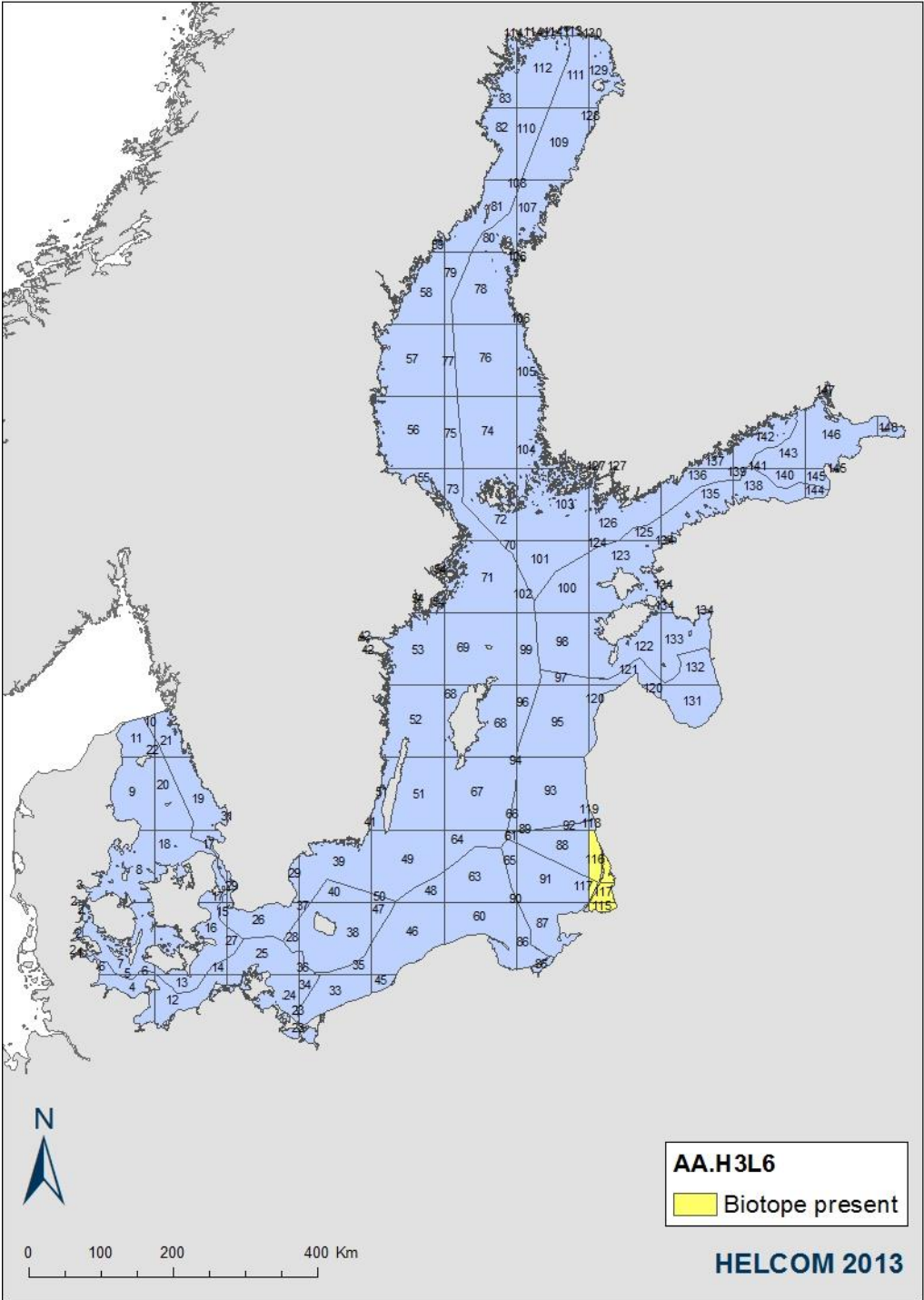
Habitat and Ecology

The biotope occurs mainly in estuaries and very sheltered lagoons. The bivalve mollusk species in the Unionidae family are filter feeding freshwater mussels and make up $\geq 50\%$ of the macroinfaunal biomass. The bivalves are relatively large, approximately 10 cm in length, and can slowly move along in the muddy substrate. They live in soft sediment, solitary or in groups. Unionids have slow growth, low fecundity and are long lived (Karatayev et al. 1997).

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Distribution and status in the Baltic Sea region

The biotope is known to occur in the eastern parts of the Curonian lagoon in Lithuania. Mussel species of the family Unionidae occur in the whole Baltic Sea region and can occur in densities high enough to be habitat forming in estuaries. 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

Eutrophication is the major threat to this biotope by increasing the particle concentration in the watermass, impeding the filter-feeding of the Unionidae mussels.

The alien species zebra mussel (*Dreissena polymorpha*) is also thought to pose threat to the biotope. *Dreissena polymorpha* has invaded the Baltic Sea already in the 19th century as a result of the construction of canals in Europe. It originates from the Ponto-Caspian region and was firstly found in the south-eastern Baltic lagoons and estuaries in 1825. It has established in several parts of the Baltic Sea. The spread of the species is restricted by salinity and temperature as it cannot survive freezing. In the Gulf of Finland the recruitment success of new larvae is only possible during more favourable warmer years (Orlova & Panov 2004). In the Curonian Lagoon *D. polymorpha* is the dominant species forming mussel beds over approximately 23% of the Lagoon's bottom area (Leppäkoski et al. 2002) and competes with the Unionidae for food and space. Unionidae shells provide hard substratum for the settlement of zebra mussel juveniles. The overgrowth of Unionidae mussels by *D. polymorpha* impairs their filter-feeding and burrowing and movement along the sediment surface. Evidence of local Unionidae extinction due to a *D. polymorpha* invasion has been found in Belarus lakes (Burlakova et al. 2000), North American Great Lakes (Schloesser & Nalepa 1996) and the Mississippi River (Ricciardi et al. 1998).

Assessment justification

A1

The invasive species *Dreissena polymorpha* has spread throughout the Baltic Sea and occupies large areas that may previously have been Unionidae dominated. During the past 50 years the area covered by the Unionidae dominated biotope has been estimated to have decreased by $\geq 25\%$.

The swollen river mussel (*Unio tumidus*) that is native to countries of the south eastern region of the Baltic Sea is characteristic for the biotope. *U. tumidus* is listed as Vulnerable in the Lithuanian national red list assessment.

Recommendations for actions to conserve the biotope

More research on the interactions of the alien and native species in Baltic Sea condition is needed. Prevention actions to stop alien species from invading the Baltic Sea should be carried out.

Common names

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References

- Burlakova, L. E., Karatayev, A. Y., Padilla, D. K. (2000). The Impact of *Dreissena polymorpha* (PALLAS) Invasion on Unionid Bivalves. *International Review of Hydrobiology* 85: 529-541.
- Karatayev, A. Y., Burlakova, L. E., Padilla, D. K. (1997). The effect of *Dreissena polymorpha* (Pallas) invasion on aquatic communities in Eastern Europe. *Journal of Shellfish Research* 16: 187–203.
- Leppäkoski, E., Gollasch, S., Gruzka, P., Ojaveer, H., Olenin, S., Panov, V. (2002). The Baltic—a sea of invaders. *Canadian Journal of Fisheries and Aquatic Sciences* 59: 1175-1188.
- Orlova, M.I., Panov, V. E. (2004). Establishment of the zebra mussel, *Dreissena polymorpha* (Pallas), in the Neva Estuary (Gulf of Finland, Baltic Sea): distribution, population structure and possible impact on local unionid bivalves. *Hydrobiologia* 514: 207-217.
- Ricciardi, A., Never, R. J., Rasmussen, J. B. (1998). Impending extinctions of North American freshwater mussels (Unionoida) following the zebra mussel (*Dreissena polymorpha*) invasion. *Journal of animal ecology* 67: 613-619.

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Schloesser, D. W., Nalepa, T. F. (1996). Zebra Mussel Infestation of Unionid Bivalves (Unionidae) in North America. *American Zoologist* 36: 300-310.