BIOTOPE INFORMATION SHEET

English name: **Baltic photic muddy or coarse sediment, sand or mixed substrate dominated by Charales**		Code in HELCOM HUB: **AA.H1B4, AA.I1B4, AA.J1B4, AA.M1B4**	
Characteristic species: *Chara aspera, Chara canescens, Chara baltica, Chara horrida, Chara tomentosa, Tolypella nidifica*			
Past and Current Threats (Habitat directive article 17): Eutrophication (H01.05), Fishing (bottom trawling F02.02.01), Construction (dredging J02.02.02, dumping J02.11.01), Ditching (J02.01)		Future Threats (Habitat directive article 17): Eutrophication (H01.05), Ditching (J02.01), Construction (dredging J02.02.02, dumping J02.11.01, J02.12, modification of hydrographic function J02.05), Other threat factors (aquaculture F01), Climate change (M02)	
Red List Criteria: **A1**	Confidence of threat assessment: **L, M (AA.H1B4)**	**HELCOM Red List Category:**	**NT NearThreatened**
Previous HELCOM Red List threat assessments			
BSEP 75 (HELCOM 1998): "2" Heavily endangered 2.5.2.2 Sublittoral level sandy bottoms dominated by macrophyte vegetation "3" Endangered 2.4.2.2 Sublittoral level gravel bottoms dominated by macrophyte vegetation 2.4.3.2 Hydrolittoral level gravel bottoms dominated by macrophyte vegetation 2.7.2.2. Sublittoral muddy bottoms dominated by macrophyte vegetation 2.7.3.2. Hydrolittoral muddy bottoms dominated by macrophyte vegetation 2.8.2.2 Sublittoral mixed sediment bottoms dominated by macrophyte vegetation 2.8.3.2. Hydrolittoral mixed sediment bottoms dominated by macrophyte vegetation		BSEP 113 (HELCOM 2007):	
Greater concern stated by:			

Habitat and Ecology

The biotope consists of submerged vegetation with rhizoids growing in mixed substrate or all kinds of soft bottoms (coarse, sandy and muddy sediments) of the photic zone. Charales constitutes at least 50% of the biovolume. Characteristic species are *Chara aspera*, *C. baltica*, *C. canescens, C. horrida, C. tomentosa* and *Tolypella nidifica*. Which species dominate depend partly on the salinity range, the kind of sediment but also on the growth season. *Chara tomentosa* for example has higher densities on muddy sediments (Berg et al. 2004) and *Tolypella nidifica* is a typical early summer species (Schubert et al. 2003).

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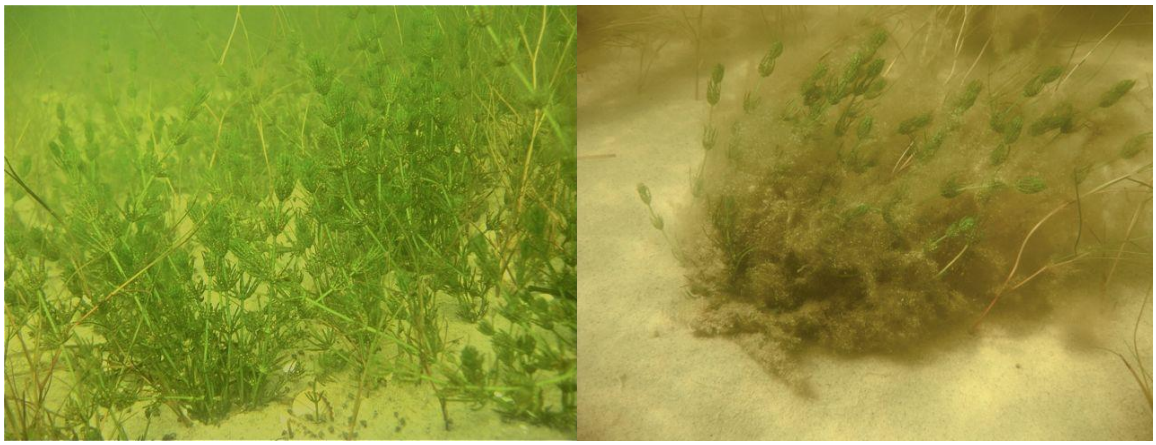
Several other charophyte species may accompany those species: *Lamprothamnion papulosum* (in higher salinities only), *Chara braunii*, *Chara connivens,* etc, but seldom reach higher densities. Also higher plants like *Zostera* spp., *Ruppia* spp., *Zannichellia palustris* and *Stukenia* (formerly *Potamogeton*) *pectinata* may occur in the biotope (Berg et al. 2004).



Charophytes (mainly *Chara baltica*) mixed with some higher plants on sandy bottom (left), *Chara baltica* overgrown by epiphytes(rightI (Photo: Karin Fürhaupter, MariLim GmbH)

Charophytes are characteristic brackish and freshwater macrophytes and therefore play a very important role within the Baltic Sea vegetation (Schubert & Blindow 2003). Some species occur in salinities up to 18–25 psu, but the typical salinity range of the biotope covers 2–15 psu. In higher salinities usually higher plants dominate the vegetation.

Charophytes are sensitive to wave and current exposure and typically grow in sheltered to moderately sheltered bays, fjords and coastal lagoons (Schubert & Blindow 2003) including flads and gloe-flads. Along the outer coastlines they may grow if islands, peninsulas or sandbanks/reefs give shelter.

Due to comparable high light requirements of the characteristic species the biotope is distributed only in the upper photic zone around 0.5–8 meters depth (Tolstoy & Österlund 2003). Single specimens and certain species (e.g. *Tolypella nidifica*) may also occur deeper. Those high light requirements cause a high sensitivity to eutrophication (Torn et al. 2004) causing decreasing depth distribution limits and densities.

The specific highly branched growth form of charophytes and their partly calcified plant body offer settling ground for epiphytes and epifauna (Blindow et al. 2000) like hydrozoans or bryozoans (*Electra crustulenta*). Besides attached organisms also grazing snails, amphipods, insects such as specialized beetles (Holmen 1987) and small fish (stickleback, pipefish) use the biotope as living ground. Especially in high eutrophicated areas, epiphytic growth of ephemerals can cover charophytes completely and decrease the production and growth of the Charales. Bacterial decomposition of those high organic masses may lead to oxygen depletion and cause a breakdown of the biotope and its communities. Charophytes are able to recolonize from the spore bank when suitable conditions reoccur.

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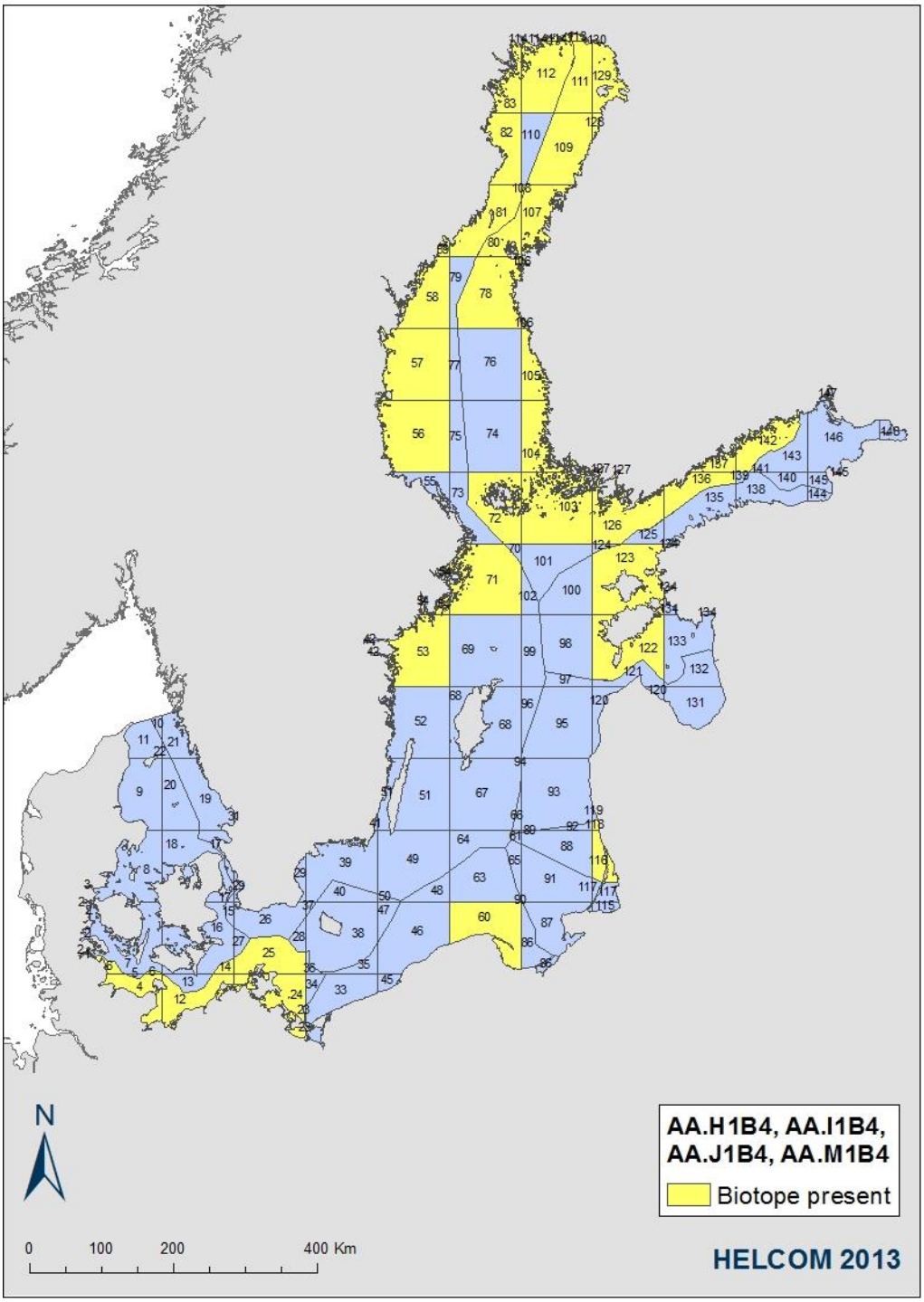
Distribution and status in the Baltic Sea region

The Charales biotopes are distributed along the whole Baltic Sea coastline. The biotope covers large areas in the comparatively large, shallow and sheltered German Bodden areas, the Polish and Lithuanian Lagoons, the Latvian Bay of Riga and Estonian, and along the coasts of Finland and Sweden especially in flads. The higher the salinities, the higher the diversity of the biotope with respect to accompanying plant species and inhabiting invertebrate and fish communities. The diversity of Charales and related genera can however increase with decreasing salinity, as the charophytes are brackish and freshwater macrophytes. 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

Observed declines of the spatial distribution of Charales biotopes are mainly caused by increased eutrophication and connected effects. Decreasing light penetration depth, massive growth of ephemeral algae and increased siltation rates cause massive alterations in the biotopes of sheltered coastal areas. The enclosed characteristic of bays and lagoons intensify the eutrophication impacts.

Coastal constructions (ditching, deepening of harbour access channels, leisure facilities and increased tourism has led to a further degradation of the biotope. The threat level is particularly high in the Western and Southern Baltic Sea (OCEANA 2011). In the future climate change (increasing exposure levels, temperatures) or increasing aquaculture in bays may cause additional threats.

Assessment justification

A1

During the last 50 years the quantity of the *Charales* biotope has declined by >25%. As previously mentioned the biotope has declined to a varying extent in different Baltic Sea regions with the strongest decline in the Western and Southern Baltic Sea. In some bays and lagoons conditions have changed so intensively that the biotope has disappeared completely.

The decline in the Western and Southern Baltic Sea begun almost 100 years ago, however there is not enough reliable information to classify the biotope under A3, which requires data or inference as to the decline in quantity over the last 150 years.

Recommendations for actions to conserve the biotope

Combatting local sources of eutrophication (mainly agriculture) as well as conservation measures, such as restrictions on coastal constructions and dredging, in shallow coastal lagoons and archipelago areas can prevent the biotope from further decline (HELCOM Website).

Common names

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References

Berg Ch., Dengler J., Abdank A., Isermann M. 2004. Die Pflanzengesellschaften Mecklenburg-Vorpommerns und ihre Gefährdung – Textband. Weissdorn-Verlag, Jena: 94–98.

Blindow, I. (2000): Distribution of charophytes along the swedish coast in relation to salinity and eutrophication. Internat. Rev. Hydrobiol. 85 (5–6): 707–717.

HELCOM (1998). Red List of marine and coastal biotopes and biotopes complexes of the Baltic Sea, Belt Sea and Kattegat. Baltic Sea Environmental Proceedings No. 75. Helsinki Commission, Helsinki. 115pp. Available at: http://www.helcom.fi/stc/files/Publications/Proceedings/bsep75.pdf

HELCOM Website
http://www.helcom.fi/environment2/biodiv/endangered/Algae/en_GB/Chara_horrida/

Holmen, M. 1987. The aquatic Adephaga (Coleptera) of Fennoscandia and Denmark. I. Gyrinidae, Haliplidae, Hygrobiidae and Noteridae. Fauna Ent. Scand. 20:1-168.

OCEANA (2011). Conservation proposals for ecologically important areas in the Baltic Sea. p. 31. http://oceana.org/sites/default/files/reports/OCEANA_Baltic_report_2011_ENG.pdf

Schubert, H. & I. Blindow (eds.) (2003): Charophytes of the Baltic Sea. The Baltic Marine Biologists Publication, No. 19: 326 S.

Schubert, H.; Blümel, C.; Eggert, A.; Rieling, T.; Schubert, M. & U. Selig (2003): Entwicklung von leitbildorientierten Bewertungsgrundlagen für innere Küstengewässer der deutschen Ostseeküste nach der EU-WRRL. Forschungsbericht zum BMBF Projekt ELBO. FKZ 0330014: 1-109.Tolstoy , A.,

Österlund, K. (2003). Alger vis Sveriges östersjökust – en fotoflora. ArtDatabanken, SLU. Almqvist & Wiksell Tryckeri, Uppsala. 282 pp.

Torn, K., Martin, G., Kukk, H., Trei, T. (2004). Distribution of charophytes along the Swedish coast in relation to salinity and eutrophication. Scientia Marina 68: 129-136.