Aquatic moss communities on Baltic infralittoral rock and mixed substrata (predominantly hard)

Summary

Aquatic moss communities on Baltic infralittoral rock and mixed substrates may form extensive underwater meadows in sheltered waters. *Fontinalis* spp. penetrate into the southernmost part of the Gulf of Bothnia (Oregrund Archipelago) and are common in the Tvarminne area while *Drepanocladus* spp. are reported from the Gulf of Bothnia and Gulf of Finland. The habitat has not been extensively studied in the Baltic (compared to freshwater equivalents) but is believed to provide shelter and food for benthic animals as well as suitable spawning locations for some fish. The pressures and threats to this habitat are likely to be associated with decline in water quality, sedimentation, and physical damage and therefore any conservation measures which reduce such threats would be beneficial.

Synthesis

This habitat is limited to areas of low salinity in the Gulf of Bothnia and Gulf of Finland but there are no quantitative data on its geographical extent or on any changes in quality in recent or historic periods of time. Expert opinion is that there has been less than a 25% decline in extent over the last 50 years.

The overall assessment for this EUNIS level 4 habitat has been based on the HELCOM (2013) assessments for the associated HELCOM HUB biotopes. Draft assessments were derived using a weighted approach whereby the HELCOM assessment outcomes were assigned a score. This was averaged acrossthe relevant biotopes. The outcomes were reviewed by Baltic experts to reach a final conclusion. HELCOM (2013) assessed the two relevant Baltic biotopes (AA.A1D and AA.M1D) to be of Least Concern (based on criterion A1). With no additional information on changes in extent or quality of this habitat the current expert opinion is an assessment of Least Concern in both the EU 28 and EU 28+

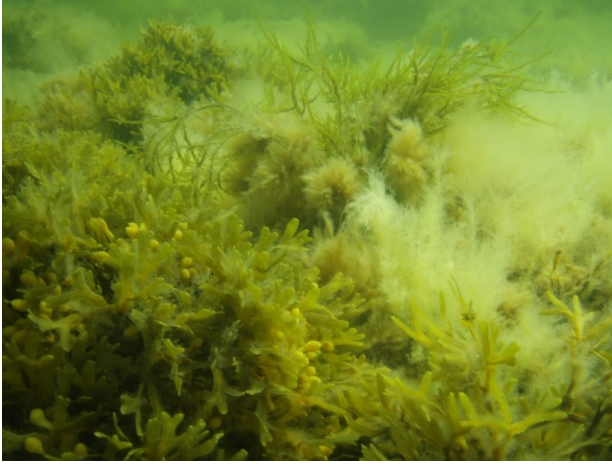| Overall Category & Criteria			
EU 28		EU 28+	
Red List Category	Red List Criteria	Red List Category	Red List Criteria
Least Concern	-	Least Concern	-

Sub-habitat types that may require further examination

None.

## Habitat Type

Code and name

Aquatic moss communities on Baltic infralittoral rock and mixed substrata (predominantly hard)

© OCEANA / Carlos Minguell. Willow moss (Fontinalis antipyretica), Langron, Bothnian Sea, Sweden. Oceana Hanse Explorer Baltic Sea Expedition. April 2011.

Musgo de agua (Fontinalis antipyretica), Lasngron, Mar de Botnia, Suecia. Expedición al Mar Báltico del Oceana Hanse Explorer. Abril 2011

Aquatic moss *Fontinalis* amongst algae on boulders in the Northern Bothnian Sea, Vasa archipelago, Finland. (© J.Leinikki).
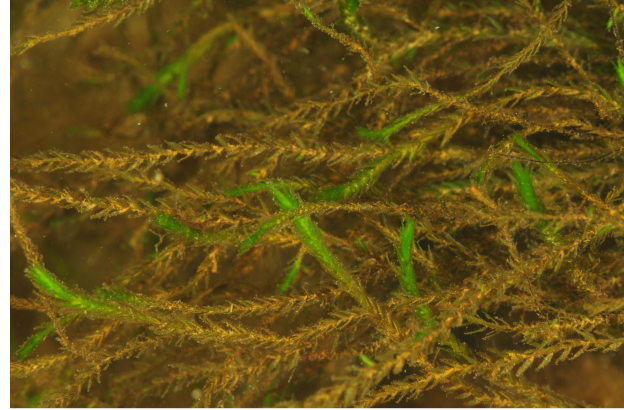
The willow moss *Fontinalis antipyretica*, Langron, Bothnian Sea. (© Oceana).

Habitat description

This is a Baltic Sea benthic habitat in the photic zone where at least 90% of the substrate is rock, boulders or stones according to the HELCOM HUB classification, or mixed (predominantly hard) substrates where the percentage of rock is lower but between 10- 90%. Perennial mosses cover at least 10% of the seabed and more than other perennial attached erect groups. In some places the mosses form extensive underwater meadows which provide shelter and food for benthic animals. The habitat typically occurs where the salinity is <5 psu and usually from depths of 1-7m. Whilst more common in exposed areas, it does occur under other conditions of exposure to wave action and currents.

Indicators of quality:

Both biotic and abiotic indicators have been used to describe marine habitat quality. These include: the presence of characteristic species as well as those which are sensitive to the pressures the habitat may face; water quality parameters; levels of exposure to particular pressure, and more integrated indices which describe habitat structure and function, such as trophic index, or successional stages of development in habitats that have a natural cycle of change over time. There are no commonly agreed indicators of quality for this habitat, although particular parameters may have been set in certain situations e.g. protected features within Natura 2000 sites, where reference values have been determined and applied on a location-specific basis.Depth range, biodiversity and the amount of epiphytic ephemeral filamentous algae are potential indicators of quality.

Characteristic species:

Fontinalis spp. Fissidens fontanus, Platyhypnidium riparioides

Classification

EUNIS:

The closest correspondence in EUNIS (2004) level 4 is A3.4 Baltic exposed infralittoral rock,A3.5 Baltic moderately exposed infralittoral rock and A3.6 Baltic sheltered infralittoral rock.

Annex 1:

The relationship between HUB biotopes and Annex 1 habitats has not yet been mapped by HELCOM, however this habitat may occur in the following Annex 1 habitats:

1160 Large shallow inlets and bays

1170 Reefs

1650 Boreal Baltic narrow inlets

MAES:

Marine - Marine inlets and transitional waters

Marine - Coastal

MSFD:

Shallow sublittoral rock & biogenic reef

EUSeaMap:

Shallow photic rock and biogenic reef

IUCN:

9.2 Subtidal Rock and Rocky Reefs

Other relationships:

Level 5 of the HELCOM HUB classification (2013).

AA.A1D Baltic photic rock and boulders characterized by aquatic moss

AA.M1D Baltic photic mixed substrate characterized by aquatic moss.

Does the habitat type present an outstanding example of typical characteristics of one or more biogeographic regions?
Yes

<u>Regions</u>
Baltic

<u>Justification</u>
Aquatic moss habitats typically occur in freshwater but the low salinity conditions in the northern Baltic have enabled them to become established in coastal waters.

Geographic occurrence and trends

Region	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
Baltic Sea	Gulf of Bothnia: Present Gulf of Finland: Present	Unknown Km^2	Unknown	Unknown

Extent of Occurrence, Area of Occupancy and habitat area

	Extent of Occurrence (EOO)	Area of Occupancy (AOO)	Current estimated Total Area	Comment
EU 28	Unknown Km^2	Unknown	Unknown Km^2	
EU 28+	Unknown Km^2	Unknown	Unknown Km^2	

Distribution map
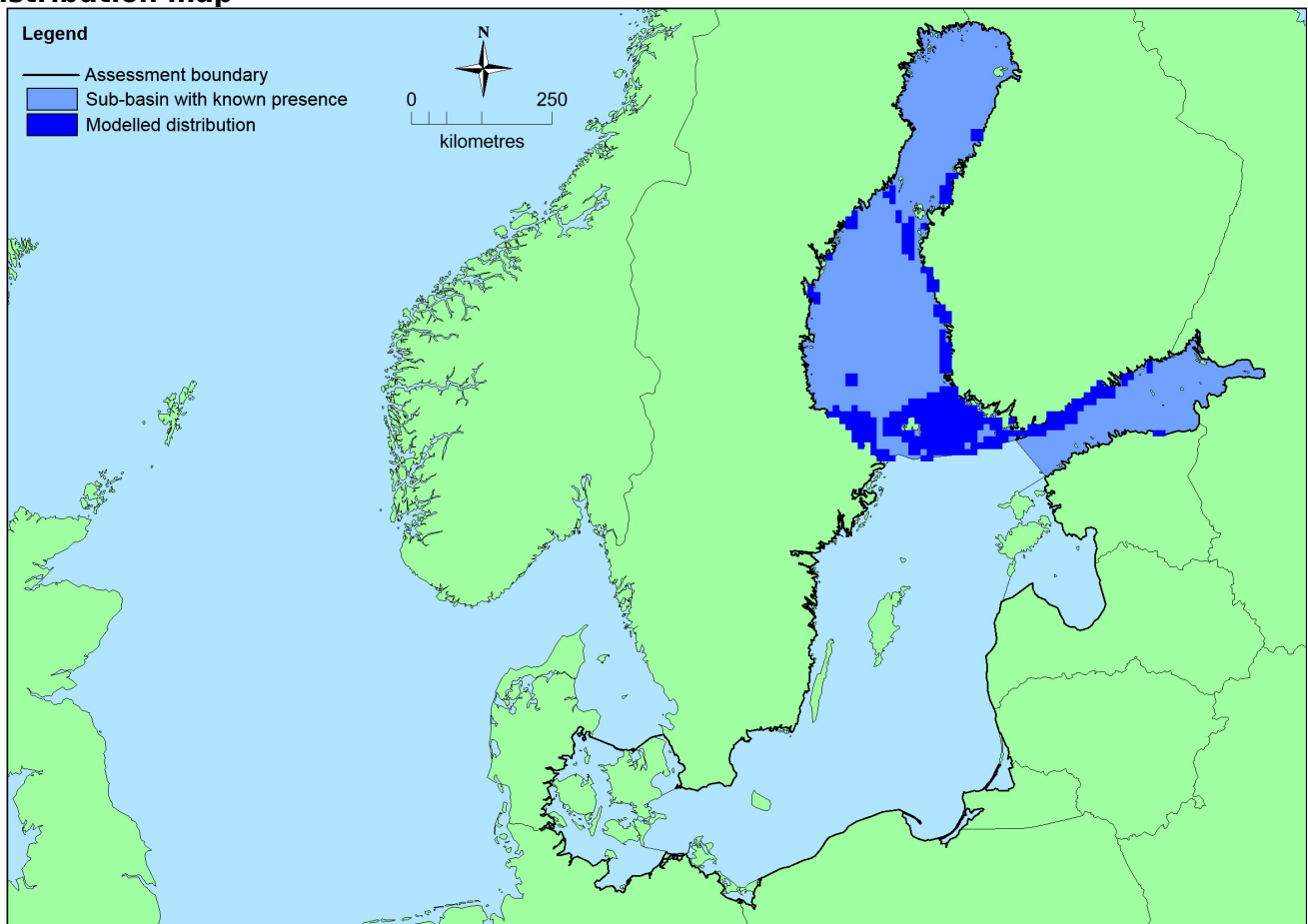
There are insufficient data to provide a comprehensive and accurate map of the distribution of this habitat. This map has therefore been generated using the modelled data available on EMODnet for EUNIS level 3 habitats in the Baltic Sea (EMODnet, 2010). This means it indicates potential areas in which this habitat may occur, not the actual distribution of this EUNIS level 4 habitat. EOO and AOO cannot be calculated at the present time.

How much of the current distribution of the habitat type lies within the EU 28?
Unknown

Trends in quantity

There is insufficient information to make an assessment of the current quantity of this habitat or any historical trends in quality. No future trends have been estimated.

- Average current trend in quantity (extent)
  EU 28: Unknown
  EU 28+: Unknown
- Does the habitat type have a small natural range following regression?
  Unknown
  Justification
- Does the habitat have a small natural range by reason of its intrinsically restricted area?
  Unknown

Justification

Trends in quality

There is insufficient information to make an assessment of the current quality of this habitat or any historical trends. No future trends have been estimated.

- Average current trend in quality
  EU 28: Unknown
  EU 28+: Unknown

Pressures and threats

There is limited information on pressures and threats specifically relating to this habitat but they could be expected to include poor water quality including nutrient enrichment (N, P and organic matter) and sedimentation which would reduce light levels, encourage the growth of epiphytes and potential smother the aquatic mosses which are the characteristic species of this habitat.

List of pressures and threats

Pollution

Pollution to surface waters (limnic, terrestrial, marine & brackish)
Nutrient enrichment (N, P, organic matter)

Natural System modifications

Human induced changes in hydraulic conditions
Siltation rate changes, dumping, depositing of dredged deposits
Other human induced changes in hydraulic conditions

Conservation and management

There is limited information on conservation and management measures specifically relating to this habitat but they could be expected to include those which reduce the risks of eutrophication and increase water clarity.

List of conservation and management needs

Measures related to wetland, freshwater and coastal habitats

Restoring/Improving water quality

Conservation status

Annex 1:

1160: MBAL U2

1170: MBAL U1

1650: MBAL U2.

Status of Annex 1 types in Baltic as assessed by HELCOM (2013):

1160 VU C1

1170 VU C1

1650 VU C1

HELCOM has assessed the two associated biotopes (AA.A1D and AA.M1D) as LC (A1)

When severely damaged, does the habitat retain the capacity to recover its typical character and functionality?

Unknown

Effort required

Red List Assessment

Criterion A: Reduction in quantity

Criterion A	A1	A2a	A2b	A3
EU 28	<25 %	unknown %	unknown %	unknown %
EU 28+	<25 %	unknown %	unknown %	unknown %

There are no quantitative data on trends in the area covered by this habitat type in the Baltic. Expert opinion is that there has been less than a 25% decline over the last 50 years. This habitat has therefore been assessed as Least Concern under Criterion A.

Criterion B: Restricted geographic distribution

Criterion B	B1				B2				B3
	EOO	a	b	c	AOO	a	b	c	
EU 28	unknown Km²	Unknown	Unknown	unknown	unknown	Unknown	Unknown	unknown	unknown
EU 28+	unknown Km²	Unknown	Unknown	unknown	unknown	Unknown	Unknown	unknown	unknown

Experts consider there to be insufficient data on which to calculated EOO or AOO. This habitat has therefore been assessed as Data Deficient under criteria B.

Criterion C and D: Reduction in abiotic and/or biotic quality

Criteria C/D	C/D1		C/D2		C/D3	
	Extent affected	Relative severity	Extent affected	Relative severity	Extent affected	Relative severity
EU 28	unknown %	unknown %	unknown %	unknown %	unknown %	unknown %
EU 28+	unknown %	unknown %	unknown %	unknown %	unknown %	unknown %

Criterion C	C1		C2		C3	
	Extent affected	Relative severity	Extent affected	Relative severity	Extent affected	Relative severity
EU 28	unknown %	unknown %	unknown %	unknown %	unknown %	unknown %
EU 28+	unknown %	unknown %	unknown %	unknown %	unknown %	unknown %

Criterion D	D1		D2		D3	
	Extent affected	Relative severity	Extent affected	Relative severity	Extent affected	Relative severity
EU 28	unknown %	unknown%	unknown %	unknown%	unknown %	unknown%
EU 28+	unknown %	unknown%	unknown %	unknown%	unknown %	unknown%

Experts consider there to be insufficient data on which to assess criteria C/D.

Criterion E: Quantitative analysis to evaluate risk of habitat collapse

Criterion E	Probability of collapse
EU 28	unknown
EU 28+	unknown

There is no quantitative analysis available to estimate the probability of collapse of this habitat type.

Overall assessment "Balance sheet" for EU 28 and EU 28+

	A1	A2a	A2b	A3	B1	B2	B3	C/D1	C/D2	C/D3	C1	C2	C3	D1	D2	D3	E
EU28	LC	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD
EU28+	LC	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD

Overall Category & Criteria			
EU 28		EU 28+	
Red List Category	Red List Criteria	Red List Category	Red List Criteria
Least Concern	-	Least Concern	-

Confidence in the assessment
Low (mainly based on uncertain or indirect information, inferred and suspected data values, and/or limited expert knowledge)

Assessors
S. Gubbay and N. Sanders.

Contributors
HELCOM RED LIST Biotope Expert Team 2013 and Baltic Sea Working Group for the European Red List of Habitats 2014 and 2015.

Reviewers
S.A. Wikström.

Date of assessment
01/07/2015

Date of review
12/01/2016

References

HELCOM, 2013. *Checklist of Baltic Sea Baltic Sea Macro-species*. Kontula, T. and Haldin, J. (Eds), Helsinki, Finland.

HELCOM, 2013. *Red List of Baltic Sea underwater biotopes, habitats and biotope complexes.* Avellan, L. (Ed). Helsinki, Finland.

Kautsky, H., Plantman, P. & Borgiel, M., 1999. *Quantitative distribution of aquatic plant and animal communities in the Forsmark-area.* Stockholm, Sweden.

Segeståle, S.G., 1957. Treatise on Marine Ecology and Paleoecology. *Geological Society of America* 67(1): 751-800 Memoir.