Epifaunal communities on Baltic infralittoral muddy sediment

Summary

This habitat occurs in all the Baltic Sea sub-basins. It is a benthic habitat in the photic zone where the predominant substrate is muddy sediment. No perennial attached erect group, perennial unattached algae or annual algae cover more than 10% of the substrate but there is at least 10% coverage by sessile/semi-sessile epibenthic polychaetes. Demersal fisheries are known to be a pressure on habitats of infralittoral muddy sediment resulting in modification of species composition. Beneficial management measures for this habitat include the regulation of fishing activities which damage or disturb seabed communities, including through the estabishment of marine protected areas.

Synthesis

The presence of this habitat type in the Baltic is known and although it has been recorded in all the sub-basins quantitative data on the area covered is not available. There is also a lack of quantitative data on current status and changes in extent and quality for the entire Baltic over the last 50 years but expert opinion is that overall it is considered to have been stable.

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 across the relevant biotopes. The outcomes were reviewed by Baltic experts to reach a final conclusion. HELCOM (2013) assessed the two associated biotopes AA.H1E1 and AA.H1E2 as Least Concern (A1). A further two biotopes AA.H1E3 and AA.H1V were not evaluated. With no additional data available the current expert opinion is that this habitat should be assessed as Least Concern for 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

Epifaunal communities on Baltic infralittoral muddy sediment

No characteristic photographs of this habitat currently available.

Habitat description

This is a Baltic Sea benthic habitat in the photic zone where at least 90% of the substrate is muddy sediment according to the HELCOM HUB classification. No perennial attached erect group, perennial unattached algae or annual algae cover more than 10% of the substrate but there is at least 10% coverage by sessile/semi-sessile epibenthic polychaetes. This habitat is found in low to moderate energy exposure classes. Three associated biotopes have been identified where the dominant species constitute at least 50% of the biomass of the epibenthic bivalves. These are; ‘Baltic photic muddy sediment dominated by Mytilidae’ (AA.H1E1) ‘Baltic photic muddy sediment dominated by Zebra mussel (*Dreissena polymorpha*)’

(AA.H1E2); and ‘Baltic photic muddy sediment dominated by valve snails (*Valvata* spp.)’ (AA.H1E3).

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. Diversity, abundance and biomass of fauna are potential indicators of quality.

Characteristic species:

Mytilus spp*., Hediste diversicolor, Gammarus* spp*., Dreissena polymorpha* (depending on the biotope).

Classification

EUNIS:

The closest correspondence in EUNIS (2004) level 4 is A5.31 Sublittoral mud in low or reduced salinity.

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:

1130 Estuaries

1160 Large shallow inlets and bays

1650 Boreal Baltic narrow inlets

MAES:

Marine - Marine inlets and transitional waters

Marine - Coastal

MSFD:

Shallow sublittoral mud

EUSeaMap:

Shallow muds

IUCN:

9.6. Subtidal muddy

Other relationships:

Level 5 of the HELCOM HUB classification (2013):

AA.H1E–Baltic photic muddy sediment characterised by epibenthic bivalves.This habitat has three biotopes on HUB level 6; ‘Baltic photic muddy sediment dominated by Mytilidae’ (AA.H1E1), ‘Baltic photic muddy sediment dominated by Zebra mussel (*Dreissena polymorpha*)’ (AA.H1E2); and ‘Baltic photic muddy sediment dominated by valve snails (*Valvata* spp.)’ (AA.H1E3).

AA.H1V–Baltic photic muddy sediment characterized by mixed epibenthic macrocommunity.

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

Yes

Regions
Baltic

Justification
Large areas of muddy sediments covered by bivalves such as *Mytilus edulis*, and/or *Modiolus modiolus* are a typical habitat in the Baltic Sea.

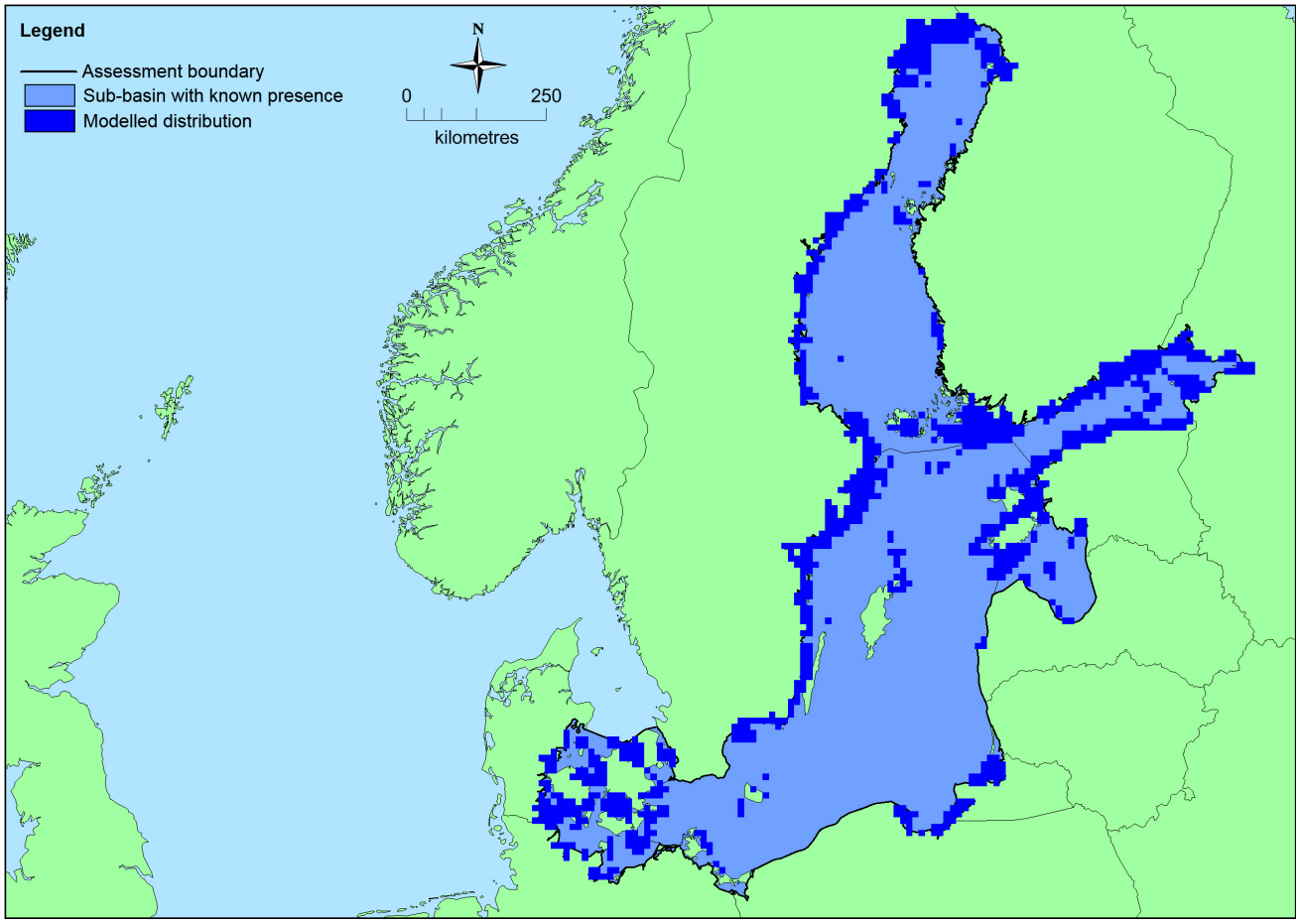
Geographic occurrence and trends

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	Baltic Proper: Present Belt Sea: Present Gulf of Bothnia: Present Gulf of Finland: Present Gulf of Riga: Present The Sound: Present	Unknown Km^2	Stable	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	>50,000 Km^2	Unknown	Unknown Km^2	This habitat is present in all the Baltic sub-basins however there is insufficient information for accurate calculation of EOO and AOO.
EU 28+	>50,000 Km^2	Unknown	Unknown Km^2	This habitat is present in all the Baltic sub-basins however there is insufficient information for accurate calculation of EOO and AOO.

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, although the habitat is known to occur in all the Baltic Sea sub-basins.

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

This habitat occurs in the EU 28+ (Russia). The percentage hosted by EU 28 is therefore less than 100% but there is insufficient information to establish the proportion. Similar habitats may occur in other European Regional Seas.

Trends in quantity

This habitat is common throughout the Baltic Sea except for the northern parts of the Bothnian Bay. It is considered to have been stable in certain areas while in others there have been either decreases or increases of approximately 10% during the past 50 years. There is no quantitative data on which to determine historic trends and no estimates of future trends.

- Average current trend in quantity (extent)
  EU 28: Stable
  EU 28+: Stable
- Does the habitat type have a small natural range following regression?
  No
  Justification
  This habitat is present in all the Baltic Sea sub-basins therefore does not have a small natural range.
- Does the habitat have a small natural range by reason of its intrinsically restricted area?
  No

Justification
This habitat is present in all the Baltic Sea sub-basins therefore does not have an intrinsically restricted area.

Trends in quality

There is insufficient information on which to determine current status and trends in quality of this habitat although it is subject to impact from demersal fisheries. A recent analysis of the fishing intensity of EU trawlers (bottom otter, beam and mid-water trawls) using Automatic Identification System (AIS) ship tracking data over one year (September 2014 -2015) shows high coverage in all European coastal waters and over the continental shelf. When combined with the modelled distribution of EUNIS marine habitat types it is possible to examine the extent of likely impact on a particular benthic habitat. For example, over this time period nearly 40% of deep infralittoral fine sand and infralittoral muddy sand areas in the Baltic Sea (including the Kattegat) were subject to such fishing pressure.

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

Pressures and threats

Demersal fisheries are known to be a pressure on habitats of infralittoral muddy sediment resulting in modification of species composition.

List of pressures and threats

Biological resource use other than agriculture & forestry

Fishing and harvesting aquatic resources
Professional active fishing

Conservation and management

Beneficial management measures for this habitat include the regulation of fishing activities which damage or disturb seabed communities, including through the estabishment of marine protected areas.

List of conservation and management needs

Measures related to marine habitats

Restoring marine habitats

Measures related to spatial planning

Other spatial measures

Measures related to hunting, taking and fishing and species management

Regulation/Management of fishery in marine and brackish systems

Conservation status

Annex 1:

1130: MBAL U2

1160: MBAL U2

1650: MBAL U2

HELCOM (2013) assessments:

1130 CR C1

1160 VU C1

1650 VU C1

HELCOM (2013) have assessed AA.H1E1 and AA.H1E2 as LC(A1), AA.J3N3 and AA.J3P1 as LC(A1) biotopes AA.H1E3 and AA.H1V were not evaluated.

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	0 %	unknown %	unknown %	unknown %
EU 28+	0 %	unknown %	unknown %	unknown %

This habitat is considered to be stable overall although in certain areas there are considered to have been either decreases or increases of approximately 10% during the past 50 years. There is no quantitative data on which to determine historic trends and no estimates of future trends. This habitat is therefore assessed as Least Concern under Criterion A for both the EU 28 and EU 28+.

Criterion B: Restricted geographic distribution

Criterion B	B1				B2				B3
	EOO	a	b	c	AOO	a	b	c	
EU 28	>50,000 Km^2	Unknown	Unknown	unknown	unknown	Unknown	Unknown	unknown	unknown
EU 28+	>50,000 Km^2	Unknown	Unknown	unknown	unknown	Unknown	Unknown	unknown	unknown

Present in all Baltic Sea basins therefore EOO exceeds 50,000km^2 however with no quantitative data on habitat extent or area, accurate calculation of EOO or AOO is not possible at the present time. This habitat has therefore been assessed as Data Deficient under criterion 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 considered 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 that estimates 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)

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Contributors
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Reviewers
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References

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