

## Epifaunal communities on Baltic circalittoral rock and mixed substrata (predominantly hard)

### Summary

This benthic habitat occurs in the aphotic zone in areas of predominantly hard substrate. Fourteen different associated biotopes have been described variously dominated by epibenthic bivalves, chordates, cnidarians, bryozoans, crustaceans and sponges. It is present in all the Baltic Sea sub-basins although some of the associated biotopes have a more restricted distribution. Areas dominated by epibenthic sponges for example are only present in the Belt Sea and Gulf of Bothnia, while biotopes dominated by hydroids and sea anemones do not occur in the Gulf of Bothnia and Gulf of Riga.

Eutrophication is considered to be a major threat to this habitat as a result of oxygen depletion, increased turbidity and sedimentation. This habitat is also threatened by physical disturbance by bottom trawling, offshore construction work and sand and gravel extraction. Actions which aim to reduce physical disturbance of aphotic stony bottoms in the Baltic Sea are important for the conservation of epifaunal turf communities on rock and mixed substrates. In addition, appointing protected areas where the habitat is known to occur and restricting activities which disturb the seabed would constitute effective conservation measures. Further mapping activities should be carried out to better delineate the area of occurrence.

### Synthesis

There have been significant declines (up to 30%) in the extent of many of the associated biotopes and predicted future declines. Some decline in quality (up to an estimated 10%) has also been reported for some of the associated biotopes but the overall trend is uncertain. The lack of quantitative data means precise figures cannot be given at the present time.

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 eight of the associated biotopes as Near Threatened (A1), and eight as Least Concern (A1). Two were not evaluated. Given the past and predicted future declines in extent of this habitat, current expert assessment is that it should be assessed as Near Threatened (A1) 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
Near Threatened	A1	Near Threatened	A1

### Sub-habitat types that may require further examination

- AB.A1F1 Baltic aphotic rock and boulders dominated by sea squirts (Ascidacea)
- AB.A1G2 Baltic aphotic rock and boulders dominated by sea anemones (Actiniaria)
- AB.A1H2 Baltic aphotic rock and boulders dominated by erect moss animals (*Flustra foliaceae*)
- AB.A1J Baltic aphotic rock and boulders characterized by epibenthic sponges (Porifera)
- AB.M1F1 Baltic aphotic mixed sediment dominated by sea squirts (Ascidacea)
- AB.M1G2 Baltic aphotic mixed substrates dominated by sea anemones (Actiniaria)

AB.M1H2 Baltic aphotic mixed substrates dominated by erect moss animals (*Flustra foliaceae*)

AB.M1J Baltic aphotic mixed substrates characterized by epibenthic sponges (Porifera)

## Habitat Type

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### Code and name

Epifaunal communities on Baltic circalittoral rock and mixed substrata (predominantly hard)



Erect growing branched sponge (*Haliclona oculata*) attached to a boulder (© K.Fürhaupter, MariLim GmbH).



The sea anemone, *Metridium senile* growing attached to a rock on mixed substrate (© IOW).

### Habitat description

This is a Baltic Sea benthic habitat in the aphotic zone where at least 90% of the substrate is rock, boulders or stones as well as on mixed (predominantly hard) substrates where the percentage of rock is between 10-90% according to the HELCOM HUB classification. The HELCOM HUB identifies 14 different biotopes associated with the habitat. In each case the dominate species or species group (in the biotope title) constitutes at least 50% of the biomass. These are: epibenthic bivalves, chordates, cnidarians, bryozoans, crustaceans and sponges.

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. The amount of sediment covering the hard surfaces and the diversity, abundance and biomass of associated fauna are potential quality indicators for this habitat.

Characteristic species:

For mussel dominated biotopes *Mytilus* spp., *Modiolus modiolus*; for epibenthic chordate dominated biotopes - seasquirts (Asciadiaceae), such as *Ciona intestinalis*, *Dendrodoa grossularia*, *Molgula* spp., *Corella parallellogramma*, *Ascidia mentula*, *Ascidia virginea* and *Ascidia obliqua*; For epibenthic cnidarians dominated biotopes- *Laomedea* spp., *Cordylophora caspia*, *Edwardsia* spp, *Metridium senile*, *Gonactinia prolifera*, *Urticina felina*, *Stomphia coccinea*, *Sagartia elegans*; for epibenthic moss animal (Bryozoa) dominated habitats. *Electra crustulenta*, *Flustra foliacea*, other Bryozoa (*Eucratea loricata*), also sponges,

sea squirts or hydrozoans; for epibenthic crustacean dominated biotopes, Balanidae, for example *Amphibalanus improvisus*, *Balanus crenatus*, *Semibalanus balanoides*; for sponge dominated biotopes *Haliclona oculata* and only rarely other species such as *Halichondria panicea*, *Halisarca dujardini* and *Scypha ciliata*. In the northern Baltic Sea only *Ephydatia fluviatilis*.

## Classification

EUNIS:

The closest correspondence in EUNIS (2004) level 4 is A4.4 Baltic exposed circalittoral rock, A4.5 Baltic moderately exposed circalittoral rock and A4.6 Baltic sheltered circalittoral 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

Shallow sublittoral mixed sediment

EUSEaMap:

Shallow aphotic rock or biogenic reef

IUCN:

9.2. Subtidal rock and rocky reefs

9.3. Subtidal Loose Rock/Pebble/Gravel

Other relationships:

Level 5 of the HELCOM HUB (2013) classification:

AB.A1E/AB.M1E Baltic aphotic rock and boulders/mixed substrates characterised by epibenthic bivalves  
These biotopes have two sub-habitats on HUB level 6; 'Baltic aphotic rock and boulders/mixed substrates dominated by Mytilidae' (AB.A1E1/AB.M1E1).

AA.A1F/AB.M1F Baltic aphotic rock and boulders/mixed substrates characterised by epibenthic chordates  
 These habitats have two sub-habitats on HUB level 6; 'Baltic aphotic rock and boulders /mixed substrates dominated by sea squirts (Ascidiacea)' (AB.A1F1/AB.M1F1).

AB.A1G/AB.M1G-Baltic aphotic rock and boulders/mixed substrate characterised by epibenthic cnidarians.  
 These biotopes have four sub-habitats on HUB level 6 'Baltic aphotic rock and boulders dominated hydroids (Hydrozoa)' (AB.A1G1) 'Baltic aphotic rock and boulders dominated by sea anemones (Actiniarida)' (AB.A1G2) 'Baltic aphotic mixed substrate dominated hydroids (Hydrozoa)' (AB.M1G1), and 'Baltic aphotic mixed substrate dominated by sea anemones (Actiniarida)' (AB.M1G2)

AB.A1H/AB.M1H-Baltic aphotic rock and boulders/mixed substrate characterised by epibenthic moss animals (Bryozoa) (all regions)

AB.A1I/AB.M1I-Baltic aphotic rock and boulders/mixed substrate characterised by epibenthic crustaceans (all regions)

AB.A1J/AB.M1J: Baltic aphotic rock and boulders/mixed substrate characterised by epibenthic sponges (Porifera) (all regions) but for mixed only Belt Sea and Gulf of Bothnia

AB.A1V/AB.M1V: Baltic aphotic rock and boulders/mixed substrates characterised by mixed epibenthic macrocommunity (all regions).

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

Yes

Regions  
 Baltic

Justification

Large areas of hard rock and boulders covered by bivalves, such as *Mytilus edulis*, bryozoans and other epifaunal turf communities are a typical habitat in the Baltic Sea.

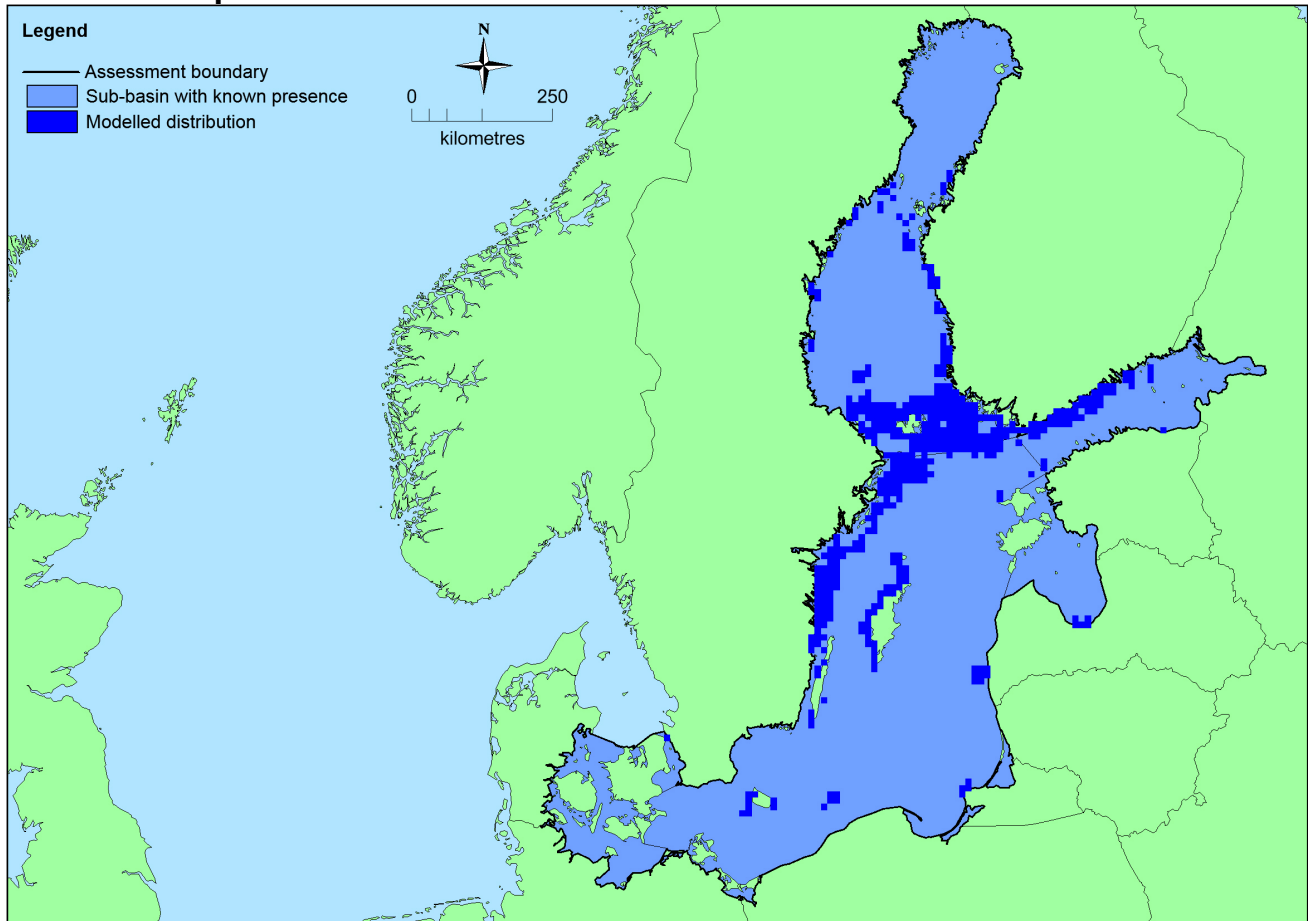
**Geographic occurrence and trends**

Region	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
<i>Baltic Sea</i>	Baltic Proper: Present Belt Sea: Present Gulf of Bothnia: Present Gulf of Finland: Present Gulf of Riga: Present The Sound: Present	Unknown Km <sup>2</sup>	Decreasing	Unknown

**Extent of Occurrence, Area of Occupancy and habitat area**

	Extent of Occurrence (EOO)	Area of Occupancy (AOO)	Current estimated Total Area	Comment
<i>EU 28</i>	>50,000 Km <sup>2</sup>	Unknown	Unknown Km <sup>2</sup>	This habitat is present in all the Baltic sub-basins however there is insufficient information for accurate calculation of EOO and AOO.
<i>EU 28+</i>	>50,000 Km <sup>2</sup>	Unknown	Unknown Km <sup>2</sup>	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. This habitat may be present in other European regional seas.

### Trends in quantity

Different trends in quantity have been identified for the different associated biotopes with all except one believed to have declined in extent by between 10-30% over the last 50 years. Future declines in extent are predicted for those biotopes dominated by bryozoans and by Mytilids.

- Average current trend in quantity (extent)

EU 28: Decreasing

EU 28+: Decreasing

- Does the habitat type have a small natural range following regression?

No

*Justification*

Overall no, but some of the associated biotopes do have a small natural range following regression. This is the case for areas dominated by erect bryozoans and by epibenthic sponges.

- Does the habitat have a small natural range by reason of its intrinsically restricted area?

No

### Justification

This habitat occurs in all the Baltic Sea sub-basins therefore does not have a small natural range.

### Trends in quality

There have been some declines in quality of some of the associated biotopes (e.g. of the order of 10% for biotopes dominated by Mytilidae), but in most cases there is insufficient information on which to make a trend analysis.

- Average current trend in quality

EU 28: Unknown

EU 28+: Unknown

### Pressures and threats

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Eutrophication is a major threat to this habitat with any associated increase in siltation rates reducing the availability of hard substrates, impeding the settlement of the larvae of colonising species. A higher particle concentration in the water may also impede the filter feeding efficiency of the some characteristic species such as adult *Flustra foliacea*. Oxygen depletion due to eutrophication could be an issue but is seen as a smaller threat. This habitat is also threatened by physical disturbances including bottom trawling and offshore construction work.

### List of pressures and threats

#### Mining, extraction of materials and energy production

Mining and quarrying

Sand and gravel extraction

Exploration and extraction of oil or gas

#### Biological resource use other than agriculture & forestry

Fishing and harvesting aquatic resources

Professional active fishing

Benthic dredging

#### Pollution

Pollution to surface waters (limnic, terrestrial, marine & brackish)

Nutrient enrichment (N, P, organic matter)

Input of contaminants (synthetic substances, non-synthetic substances, radionuclides) - diffuse sources, point sources, acute events

### Conservation and management

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All actions which aim to reduce physical disturbance of aphotic stony bottoms in the Baltic Sea are important for the conservation of epifaunal turf communities on rock and mixed substrates. In addition, appointing protected areas where the habitat is known to occur and restricting bottom trawling, offshore construction work and gravel extraction in these areas would constitute an effective conservation measure. Further mapping activities should be carried out to better delineate the area of occurrence.

### List of conservation and management needs

#### Measures related to wetland, freshwater and coastal habitats

Restoring/Improving water quality

## Measures related to spatial planning

Establish protected areas/sites

## Measures related to special resource use

Regulating/Managing exploitation of natural resources on sea

## Conservation status

Annex 1:

1160: MBAL U2

1170: MBAL U1

1650: MBAL U2

HELCOM (2013) assessments:

1160 VU C1

1650 VU C1

1170 VU C1

HELCOM (2013) have assessed eight associated biotopes as LC(A1) (AB.A1E2, AB.A1G1, AB.A1H2, AB.A1I1, AB.M1E1, AB.M1G1, AB.M1H1 and AB.M1I1). A further eight biotopes have been assessed as NT(A1) (AB.A1F1, AB.A1G2, AB.A1H2, AB.A1J, AB.M1F1, AB.M1G2, AB.M1H2 and AB.M1J). Two biotopes were not evaluated (AB.A1V and AB.M1V).

The OSPAR threatened biotope '*Modiolus modiolus* beds' occurs in the OSPAR Region II (including Kattegat) where it is listed threatened and/or declining.

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

The associated biotopes dominated by bryozoans have the potential to fairly quickly recolonise destroyed areas after the pressure/threat has been removed and the environmental conditions restored. Recovery rates are unknown for the other biotopes.

## Effort required

## Red List Assessment

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### Criterion A: Reduction in quantity

Criterion A	A1	A2a	A2b	A3
EU 28	25-30 %	unknown %	unknown %	unknown %
EU 28+	25-30 %	unknown %	unknown %	unknown %

Many of the associated biotopes have declined in extent. In some cases this has been estimated to be by up to 30% over the last 50 years. Expert opinion is that there has been an overall decline of between 25-30% over the last 50 years. This habitat has therefore been assessed as Near Threatened 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 <sup>2</sup>	Unknown	Unknown	unknown	unknown	Unknown	Unknown	unknown	unknown
EU 28+	>50,000 Km <sup>2</sup>	Unknown	Unknown	unknown	unknown	Unknown	Unknown	unknown	unknown

This habitat is found in all the Baltic Sea sub-basins therefore EOO exceeds 50,000 km<sup>2</sup> however with no quantitative data on habitat extent or area, accurate calculation of EOO and 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 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	NT	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD
EU28+	NT	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



Overall Category & Criteria			
Near Threatened	A1	Near Threatened	A1

### Confidence in the assessment

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

### Assessors

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### Contributors

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### Reviewers

T.A. Haynes.

### Date of assessment

13/07/2015

### Date of review

08/02/2016

## References

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Barthel D., Wolfrath B. 1989. Tissue sloughing in the sponge *Halichondria panacea*: a fouling organism prevent being fouled. *Oecologia* 78(3): 357-360.

Bitschofsky F., Forster S., Scholz J., 2011. Introduction in: 'Regional and temporal changes in epizooibiotic bryozoan-communities of *Flustra foliacea* (Linnaeus, 1758) and implications for North Sea ecology'. *Estuarine, Coastal and Shelf Science* 91(3): 423-433.

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

HELCOM, 2013. Biotope Information sheet. Available at:

<http://helcom.fi/Red%20List%20of%20biotopes%20habitats%20and%20biotope%20complexe/HELCOM%20Red%20List%20AA.A1H2,%20AB.A1H2,%20AA.M1H2,%20AB.M1H2.pdf>. (Accessed: 16/07/2015).

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://helcom.fi/Lists/Publications/BSEP75.pdf>. (Accessed: 16/07/2015).

Hiscock, K., Wilson, E., 2007. *Metridium senile*. Plumose anemone. Marine Life Information Network: Biology and Sensitivity Key Information Sub-programme. Plymouth: Marine Biological Association of the United Kingdom. Available at: <http://www.marlin.ac.uk/speciesfullreview.php?speciesID=3806>. (Accessed: 16/07/2015).

Moen, E., Svenson, E., 2009. *Djurliv I havet - Nordeuropeisk marin fauna*. Stockholm, Sweden.

Olenin, S. & Daunys, D., 2004. Coastal typology based on benthic biotope and community data: The Lithuanian case study. *Baltic Sea Coastline Reports* 4: 65-83.

OCEANA, 2011. *Conservation proposals for ecologically important areas in the Baltic Sea*. Available at: [http://oceana.org/sites/default/files/reports/OCEANA\\_Baltic\\_report\\_2011\\_ENG.pdf](http://oceana.org/sites/default/files/reports/OCEANA_Baltic_report_2011_ENG.pdf). (Accessed:

16/07/2015).

OSPAR, 2008. *OSPAR List of Threatened and/or Declining Species and Habitats*. Available at: [http://www.ospar.org/content/content.asp?menu=00180302000014\\_000000\\_000000](http://www.ospar.org/content/content.asp?menu=00180302000014_000000_000000). (Accessed: 16/07/2015).

Picton, B.E., Morrow, C.C., 2010. *Encyclopedia of Marine Life of Britain and Ireland*. Available at: <http://www.habitas.org.uk/marinelife/index.html>. (Accessed: 16/07/2015).

Ryland J.S., Hayward P.J. 1977. *British anascan bryozoans. Synopses of the British Fauna (New Series)*. Academic Press, London, UK.

Stresemann E., Hannemann H.-J., Klausnitzer B. Senglaub K., 1992. *Exkursionsfauna von Deutschland. Band 1*, Hannemann, H. and Klausnitzer, B., (Eds). Berlin, Germany.

Tyler-Walters H., Ballerstedt S. 2007. *Flustra foliacea*. Hornwrack. Marine Life Information Network: Biology and Sensitivity Key Information Sub-programme. Available at: <http://www.marlin.ac.uk/generalbiology.php?speciesID=3342>. (Accessed: 16/07/2015).