A1.21: Barnacles and fucoids on moderately wave-exposed Atlantic littoral rock

Summary

This habitat has a large natural range in the North East Atlantic region extending from the Canaries and Azores in the west to the Skagerrak coast of Sweden in the east. It is characterised by a mosaic of fucoids and barnacles on bedrock and boulders on the mid- and lower eulittoral zone, in areas moderately exposed to wave action.

There are few specific conservation and management measures that can be directed at this habitat. More general beneficial measures include pollution control and regulation, development control and contingency plans to be followed in the event of a major pollution incident, representation in marine protected areas and measures to reduce global warming and sea level rise.

Synthesis

Local and/or seasonal factors often exert a substantial influence on intertidal habitats making it difficult to distinguish any long-term trend across the region. This is complicated further because differences between localities are often linked to differences in geographical latitude and, therefore, to differences in climatic traits like temperature and/or ice cover.

The general distribution of this habitat is well known, it is not considered to be restricted and its extent has been mapped in detail in some locations (e.g. some Marine Protected Areas and monitoring stations). There are studies showing short and long term trends in extent and quality, for example following natural events such as severe weather conditions or pollution incidents such as oil spills, but no overview of trends in quantity and quality across the North East Atlantic.

This habitat has a large EOO and AOO, and therefore qualifies as Least Concern under criterion B. However the habitat is assessed as Data Deficient both at the EU 28 and EU 28+ levels given the lack of information on trends in quantity and quality.

Overall Category & Criteria			
EU 28		EU 28+	
Red List Category	Red List Criteria	Red List Category	Red List Criteria
Data Deficient	-	Data Deficient	-

Sub-habitat types that may require further examination

None.

Habitat Type

Code and name

A1.21: Barnacles and fucoids on moderately wave-exposed Atlantic littoral rock

Moderately exposed rocky shore with barnacles, the spiral wrack *Fucus spiralis,* and the channel wrack *Pelvetia canaliculata*. Skomer Island, south Wales, UK (© S. Gubbay).

Habitat description

Rocky shores in the mid- and lower eulittoral zone moderately exposed to wave action, characterised by a mosaic of fucoids and barnacles on bedrock and boulders. The extent of the fucoid cover is typically less than the blanket cover associated with sheltered shores except on the lower shore where there may be dense *Fucus serratus*. There is typically a lichen zone above and a kelp-dominated community below in the sublittoral zone. Where the moderately exposed lower shore rock is sand-influenced it can be characterised by dense mats of *Rhodothamniella floridula*. The presence of boulders and cobbles on the shore can increase the micro-habitat diversity, which often results in a greater species richness (crabs, tube-forming polychaetes such as *Pomatoceros triquiter*, sponges and bryozoans).

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. Indicators which have been developed for the assessment of ecological quality of coastal water bodies for the Water Framework Directive (WFD) that are relevant to this habitat include a consideration of macroalgae species richness, proportions of different taxa of algae present, and the abundance and coverage of the rocky surfaces by typical species.

Characteristic species:

In addition to the barnacles and fucoids, other species normally present in this habitat include the winkle *Littorina littorea*, the whelk *Nucella lapillu*s and the red seaweed *Mastocarpus stellatus*. Beneath the band of yellow and grey lichens at the top of the shore is a zone dominated by the wrack *Pelvetia canaliculata*, scattered barnacles, while the black lichen *Verrucaria maura* covers the rock surface. Below, on the mid-shore the wrack *Fucus vesiculosus* generally forms a mosaic with the barnacle *Semibalanus balanoides* and the limpet *Patella vulgata*. Finally, the wrack *Fucus serratus*, dominates the lower shore, while a variety of red seaweeds can be found underneath the *F. serratus* canopy.

Classification

EUNIS (v1405):

Level 4. A sub-habitat of ‘Atlantic littoral rock’ (A1.2).

Annex 1:

1170 Reefs

MAES:

Marine - Marine inlets and transitional waters

Marine - Coastal

MSFD:

Littoral rock and biogenic reef

EUSeaMap:

Not mapped

IUCN:

12.1 Rocky shoreline

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

Regions
Atlantic

Justification
This habitat is very typical of moderatly exposed rocky shores in the North East Atlantic.

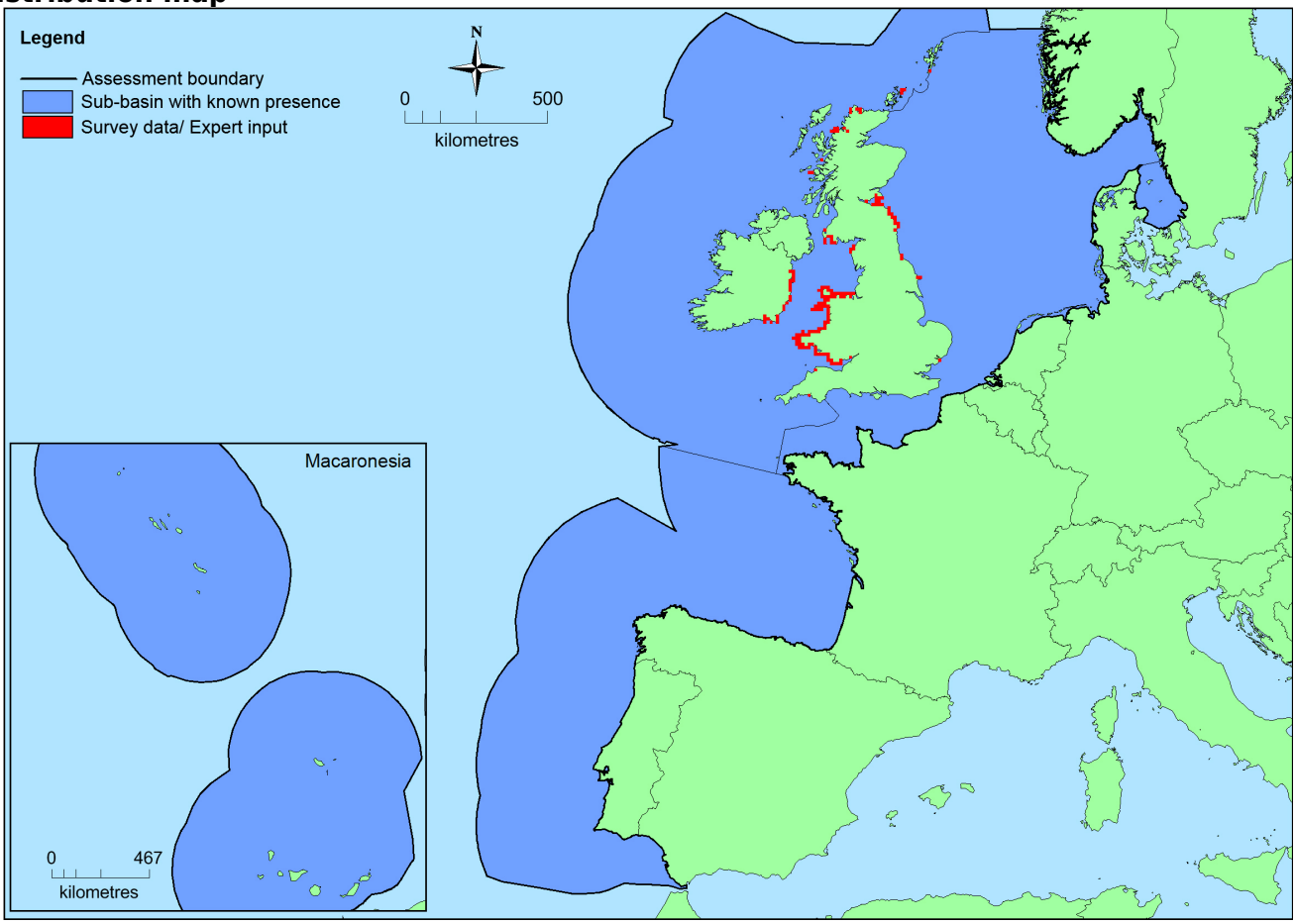
Geographic occurrence and trends

Region	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
North-East Atlantic	Bay of Biscay and the Iberian Coast: Present Celtic Seas: Present Greater North Sea: Present Macaronesia: Present Kattegat: 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	403,797 Km^2	553	unknown Km^2	EOO and AOO have been calculated on the available data. Although this data set is known to be incomplete the figures exceed the thresholds for threatened status.
EU 28+	403,797 Km^2	553	unknown Km^2	EOO and AOO have been calculated on the available data. Although this data set is known to be incomplete the figures exceed the thresholds for threatened status.

Distribution map



There are insufficient data to provide a comprehensive and accurate map of the distribution of this habitat. This map has been generated using EMODnet data from modelled/surveyed records for the North East Atlantic (and supplemented with expert opinion where applicable) (EMODnet 2010). EOO and AOO have been calculated on the available data presented in this map however these should be treated with caution as expert opinion is that this is not the full distribution of the habitat.

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

This habitat occurs in the EU 28+ (e.g. Norway, Isle of Man, Channel Islands). The percentage hosted by the EU 28 is likely to be between 85-90% but there is insufficient information to establish the exact figure.

Trends in quantity

Local and/or seasonal factors often exert a substantial influence on intertidal habitats making it difficult to distinguish any long-term trend across the region. This is complicated further because differences between

localities are often linked to differences in geographical latitude and, therefore, to differences in climatic traits like temperature and/or ice cover.

There is extensive historical data on intertidal rocky shore flora and fauna in Europe, in some cases dating back to the 1930's. This includes semi-quantitative broadscale surveys of rocky intertidal flora and fauna undertaken during the 1950's at approximately 400 sites around the coastline of Britain and Ireland, and repeated at 300 of the sites in 2001-3. Nevertheless there is insufficient information specifically on this habitat type to provide an overall estimate of historical, recent and possible future trends in quantity of this habitat for the entire North East Atlantic region.

- Average current trend in quantity (extent)
  EU 28: Unknown
  EU 28+: Unknown
- Does the habitat type have a small natural range following regression?
  No
  Justification
  This habitat has a large natural range in the North East Atlantic region extending from the Atlantic coast of France in the west, to the Skagerrak coast of Sweden in the east.
- Does the habitat have a small natural range by reason of its intrinsically restricted area?
  No
  Justification
  This habitat does not have a small natural range. It is present in the North East Atlantic region extending from the Atlantic coast of France in the west, to the Skagerrak coast of Sweden in the east.

Trends in quality

Local and/or seasonal factors often exert a substantial influence on intertidal habitats making it difficult to distinguish any long-term trend across the region. This is complicated further because differences between localities are often linked to differences in geographical latitude and, therefore, to differences in climatic traits like temperature and/or ice cover. This habitat has been studied in detail in some localities however there is insufficient information to provide an overall estimate of historical, recent and possible future trends in quality

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

Pressures and threats

This is a relatively robust habitat as it develops on wave exposed rocky shores although it is vulnerable to a number of pressures. The two pressures which are mostly likely to have an impact are pollution incidents (e.g. oil spills) and climate change. In the latter case it has been suggested that climate change may not lead to a simple poleward shift in the distribution of intertidal organisms on rocky shores but could cause localised extinctions in a series of hot-spots due to the inability of species to spread to suitable habitats. Climate change is already believed to resulted in changes in the biogeographical range and abundance of some of the species typical of this habitat.

Coastal development including coast protection works which can alter the degree of exposure, shore collection, trampling and chronic effects of chemical contamination (e.g. Tributyl tin) are also potential pressures but likely to be less of an issue than for more sheltered rocky shores.

List of pressures and threats

Pollution

Pollution to surface waters (limnic, terrestrial, marine & brackish)
Marine water pollution
Oil spills in the sea

Climate change

Changes in abiotic conditions
Temperature changes (e.g. rise of temperature & extremes)
Wave exposure changes
Sea-level changes
Changes in biotic conditions
Habitat shifting and alteration
Migration of species (natural newcomers)

Conservation and management

There are few specific conservation and management measures that can be directed at this habitat.

More general beneficial measures include pollution control and regulation, development control and contingency plans to be followed in the event of a major pollution incident, survey and monitoring programmes, raised public awareness of their ecological value and vulnerability, representation in marine protected areas and measures to reduce global warming and sea level rise.

List of conservation and management needs

Measures related to marine habitats

Other marine-related measures

Measures related to spatial planning

Other spatial measures
Establish protected areas/sites

Conservation status

Annex 1:

1170: MATL U2, MMAC FV

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

Generally the effects of chronic impacts on this habitat are reversible provided the disturbance is stopped. Recovery from acute impacts is also possible but may take much longer depending on the scale and type of impact. Studies on recovery following an oil spill suggest that recovery can take 10-15 years.

Effort required

10 years	20 years
Naturally	Naturally

Red List Assessment

Criterion A: Reduction in quantity

Criterion A	A1	A2a	A2b	A3
EU 28	Unknown %	Unknown %	Unknown %	Unknown %
EU 28+	Unknown %	Unknown %	Unknown %	Unknown %

The general distribution of this habitat is well known and its extent has been mapped in detail in some locations (e.g. some Marine Protected Areas). There are studies showing short and long term trends, for example following oil spills, in some locations but insufficient information to determine any overall trend in quantity in the North East Atlantic region. It is therefore considered to be Data Deficient under criteria 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	No	>50	Unknown	Unknown	No	No
EU 28+	>50,000 Km^2	Unknown	Unknown	No	>50	Unknown	Unknown	No	No

This habitat has a large natural range in the North East Atlantic region. The precise extent is unknown however as EOO >50,000km^2 and AOO >50, this exceeds the thresholds for a threatened category on the basis of restricted geographic distribution. Trends are unknown. The distribution of the habitat is such that the identified threats are unlikely to affect all localities at once. This habitat has therefore been assessed as Least Concern under criteria B1(c) B2 (c) and B3 and Data Deficient for all other criteria.

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

Criterion E	Probability of collapse
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	DD	DD	DD	DD	LC	LC	LC	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD
EU28+	DD	DD	DD	DD	LC	LC	LC	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
Data Deficient	-	Data Deficient	-

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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