

A1.22: *Mytilus edulis* and furoids on moderately wave-exposed Atlantic littoral rock

Summary

This habitat is widespread where this substrate and exposure conditions exists. It occurs in the mid and lower eulittoral zone on bedrock often with nearby sediment in areas exposed or moderately exposed to wave action. The surfaces may be densely covered by large individuals of the mussel *Mytilus edulis*.

The two pressures which are mostly likely to have an impact are pollution incidents (e.g. oil spills) and climate change. 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.

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.

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. Survey information confirms that this habitat has a wide range in the North East Atlantic. It has been studied in detail in some localities however there is insufficient information to determine whether there have been any historical, recent and possible future trends in quantity or quality.

This habitat has a large EOO and AOO, and therefore qualifies as Least Concern under criterion B but is assessed as Data Deficient both at the EU 28 and EU 28+ levels due to 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

A1.223: *Mytilus edulis* and piddocks on eulittoral firm clay

Habitat Type

Code and name

A1.22: *Mytilus edulis* and furoids on moderately wave-exposed Atlantic littoral rock



Mytilus edulis and fucoids on moderately wave exposed Atlantic littoral rock. Pentine Point East, Newquay, UK (© D.Connor/JNCC).

Habitat description

Mid- and lower eulittoral bedrock exposed or moderately exposed to wave action, often with nearby sediment, and which may be densely covered by large individuals of the mussel *Mytilus edulis*. Three biotopes have been described associated with this habitat: In the mid eulittoral, the mussels may form a band or large patches with scattered bladder wrack *Fucus vesiculosus*. In the lower eulittoral a range of red seaweeds including *Mastocarpus stellatus* and *Palmaria palmata* occur amongst the mussels (in higher abundance than the mid eulittoral). Clay outcrops in the mid to lower eulittoral may be bored by a variety of piddocks including *Pholas dactylus*, *Barnea candida* and *Petricola pholadiformis*, while the surface is characterised by small clumps of the mussel *M. edulis*, the barnacle *Elminius modestus* and the winkle *Littorina littorea*. Ephemeral green seaweeds such as *Ulva intestinalis* and *U. lactuca* commonly occur on the shells of the mussels. Barnacles are common on both the mussel valves and on patches of bare rock, where the limpet *Patella vulgata* is found as well, often at high abundance. The whelk *Nucella lapillus* and a range of littorinids also occur within the mussel bed. A dense *M. edulis* community may be found on more sheltered coasts on mixed substrata

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. The density and abundance of *Mytilus edulis* is also a potential indicator of habitat quality.

Characteristic species:

Mytilus edulis is the most frequently observed and abundant species associated with this habitat. The barnacle *Semibalanus balanoides*, the gastropod molluscs *Patella vulgata*, *Littorina littorea* and *Nucella lapillus* are also characteristic and the algae *Fucus serratus*, *Ulva intestinalis*, *U.lactuca*, *Palmaria palmata* and Corallinaceae.

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 widespread in the northern part of the North East Atlantic region where this substrate and exposure conditions exist.

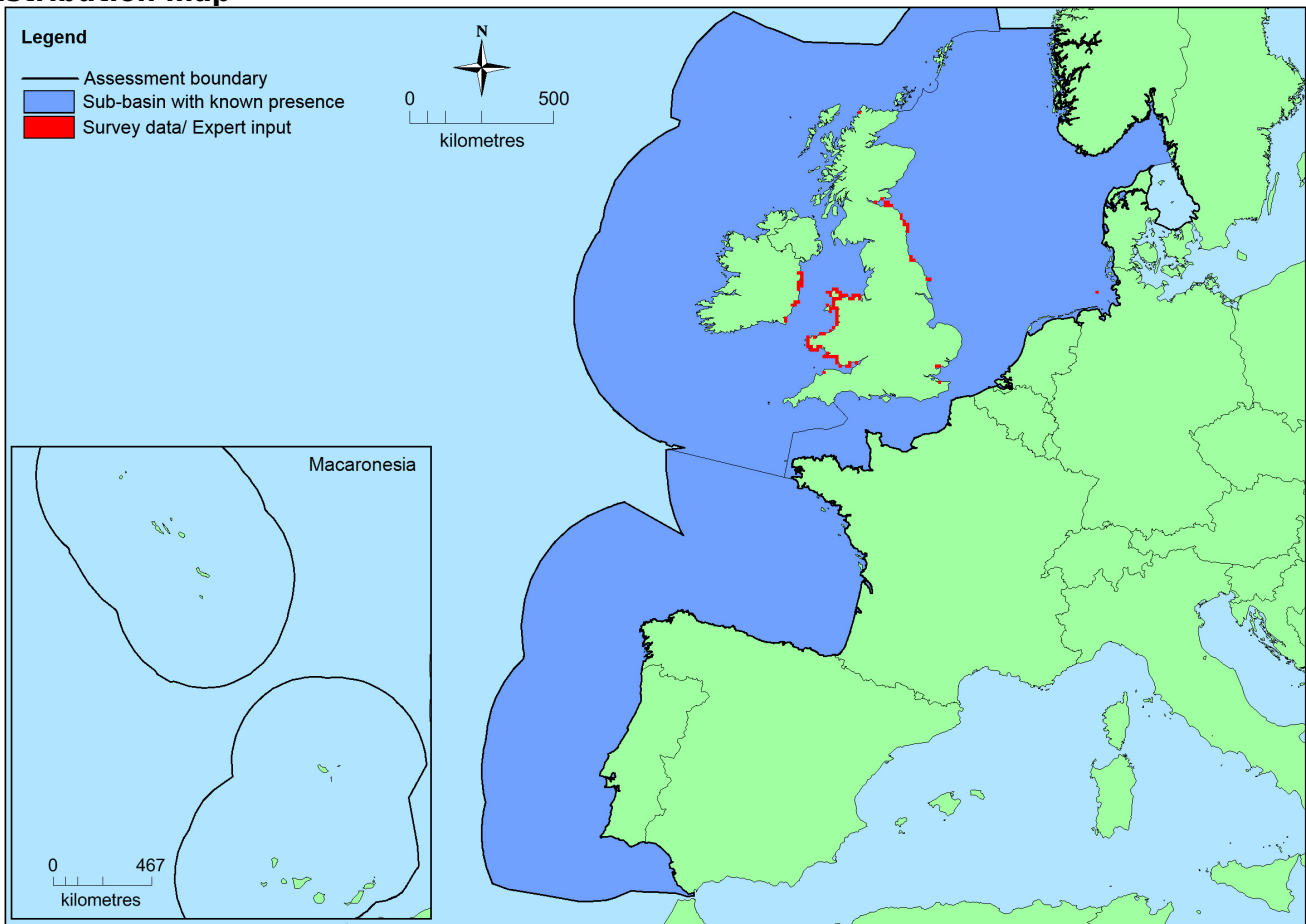
Geographic occurrence and trends

Region	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
<i>North-East Atlantic</i>	Bay of Biscay and the Iberian Coast: Present Celtic Seas: Present Kattegat: Present Greater North Sea: 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	466,615 Km ²	142	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+	>466,615 Km ²	142	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. It is also present on artificial substrates (sea walls, groynes) within EU 28 (e.g. in the Netherlands) but marine habitats associated with man-made structures are not considered in this assessment.

Trends in quantity

Unknown but likely to vary from year to year depending on physical conditions, e.g. storm frequency. Some limited quantitative data, e.g. for Helgoland, Germany, as one parameter for assessments under the Water Framework Directive. In the latter case there has been around 40% reduction in extent using 1920-30 reference values.

- 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 Canaries and Azores 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 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.

Trends in quality

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

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 have resulted in changes in the biogeographical range and abundance of some of the species typical of this habitat and storm frequency and magnitude is also known to have an impact on fucoid habitat area. 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

Urbanisation, residential and commercial development

Discharges

Biological resource use other than agriculture & forestry

Fishing and harvesting aquatic resources

Professional active fishing

Benthic dredging

Leisure fishing

Bait digging / Collection

Pollution

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

Natural System modifications

Human induced changes in hydraulic conditions
Modification of hydrographic functioning, general

Climate change

Changes in abiotic conditions

Conservation and management

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 wetland, freshwater and coastal habitats

Restoring/Improving water quality

Measures related to spatial planning

Other spatial measures
Establish protected areas/sites

Measures related to hunting, taking and fishing and species management

Regulation/Management of hunting and taking
Regulation/Management of fishery in marine and brackish systems

Conservation status

Annex 1:

1170: MATL U2

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

The mussel component can come back within 10 years and fucoids over shorter time scales so recovery of the habitat mosaic within 10 years is possible if conditions are favourable (e.g. good spatfalls and low storm frequency).

Effort required

10 years
Naturally

Red List Assessment

Criterion A: Reduction in quantity

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

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

The range 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, in some locations but insufficient information to determine any overall trends in quantity for the North East Atlantic. This habitat has therefore been assessed as Data Deficient 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	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 extending from the Azores in the west to the Skagerrak coast of Sweden in the east. The precise extent is unknown however as EOO >50,000² and AOO >50, this exceeds the thresholds for a threatened category on the basis of restricted geographic distribution. Trends are unknown but the distribution of the habitat is such that the identified threats are unlikely to affect all localities at one. 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
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)

Assessors

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Reviewers

J. Forde.

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