

A3.11 Kelp with cushion fauna and/or foliose red seaweeds on wave-exposed Atlantic infralittoral rock

Summary

This habitat occurs in the infralittoral zone in areas that are exposed or extremely exposed to wave action and/or strong tidal streams. It can extend from low water to depths of up to 45m. Typically, the rock supports a community of kelp *Laminaria hyperborea* or further south *Laminaria ochroleuca*, with foliose seaweeds. The faunal and floral understorey is generally rich in species due, in part, to the relatively low urchin grazing pressure in such shallow exposed conditions. As the exposure increases the rock surface may be covered by a dense turf of anthozoans such as *Sagartia elegans*, *Phellia gausapata* and *Corynactis viridis*, encrusting sponges and coralline algae.

Harvesting of kelp beds is the most direct pressure on this habitat. Indirectly, climate change may lead to a change in the dominant species of kelp, which characterises this habitat. Beneficial conservation and management measures, include regulation of harvesting and mitigation measures to reduce climate change effects.

Synthesis

Detailed information on the abundance and extent of this habitat is lacking, but it is known to have a widespread distribution. There is also a lack of data on the quantity and quality of this habitat, including any historical or recent, trends across the region.

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 because of the lack of information on its area and any 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	-

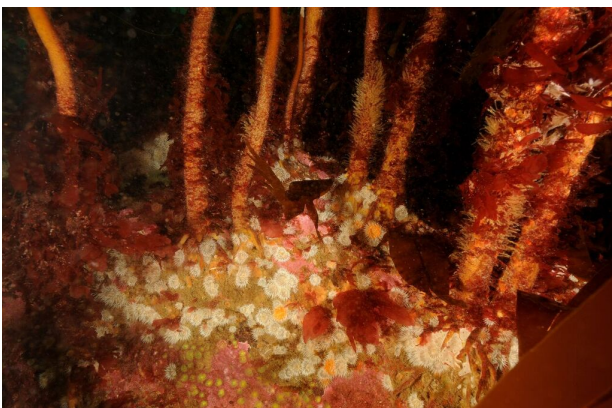
Sub-habitat types that may require further examination

None.

Habitat Type

Code and name

A3.11 Kelp with cushion fauna and/or foliose red seaweeds on wave-exposed Atlantic infralittoral rock



Habitat description

This is a rocky habitat occurring in the infralittoral zone in areas exposed or extremely exposed wave action and/or strong tidal streams. It typically occurs from low water to depths of up to 45m. The rock supports a community of kelp *Laminaria hyperborea* or further south *Laminaria ochroleuca*, with foliose seaweeds and animals, the latter tending to become more prominent in areas of strongest water movement. In extremely wave exposed conditions, the sublittoral fringe is characterised by dabberlocks *Alaria esculenta* which, may extend from 5 to 10 m depth, or even replace *L. hyperborea* as the dominant kelp in the infralittoral zone. The depth to which the kelp extends varies according to water clarity, exceptionally (e.g. St Kilda, Scotland) reaching 45 m. The shallowest kelp plants are often short or stunted, while deeper plants are taller with heavily epiphytised stipes with foliose red seaweeds. At some sites the red seaweeds can be virtually mono-specific, while at other sites show considerable variation, containing a dense mixed turf of a large variety of species.

The faunal and floral understorey is generally rich in species due, in part, to the relatively low urchin-grazing pressure in such shallow exposed conditions. As the exposure increases the rock surface is covered by a dense turf of anthozoans such as *Sagartia elegans*, *Phellia gausapata* and *Corynactis viridis*, encrusting sponges and coralline algae. The gastropod *Margarites helycinus* can be found grazing on the kelp fronds, whereas the crab *Cancer pagurus* can be found among the kelp stipes. The bryozoan *Tubularia indivisa* also occurs, but it does not form such a dense turf as in more shallow waters, while the ascidian *Botryllus leachi* is found encrusting the large brown seaweeds. *Cryptopleura ramosa* is the dominant red seaweed on horizontal surfaces. Winter storms may remove patches of kelp, and fast-growing annuals may form a temporary forest

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.

Characteristic species:

Laminaria hyperborea, *Laminaria ochroleuca*, *Alaria esculenta*, foliose red seaweeds such as *Delesseria sanguinea*, *Cryptopleura ramosa*, *Plocamium cartilagineum*, and the brown seaweed *Dictyota dichotoma*. Also found on the stipes, or on the rock below, are *Phycodrys rubens*, *Kallymenia reniformis*, *Callophyllis laciniata*, *Caryophyllia smithii*, and *Corallina officinalis*, while encrusting coralline algae can cover any bare patches of rock. The faunal composition of this habitat varies markedly between sites, but commonly occurring are the soft coral *Alcyonium digitatum* and the anthozoans *Sagartia elegans* and *Corynactis viridis*. Sponges form a prominent part of the community with variable amounts of the sponges *Halichondria panicea* and *Pachymatisma johnstonia* and several other species. The crab *Cancer pagurus* and the starfish *Asterias rubens* are normally present in small numbers foraging beneath the canopy, while the sea urchins *Echinus esculentus* and *Urticina felina* graze on the seaweeds. The hydroid *Obelia geniculata*, the ascidian *Botryllus schlosseri* and the bryozoan *Membranipora membranacea* compete for space on the kelp, whereas the bryozoan *Electra pilosa* also can be found on foliose red seaweeds. In more exposed conditions underneath the canopy of *A. esculenta* are red seaweeds such as *Mastocarpus stellatus*

and *Palmaria palmata*, while encrusting coralline red algae such as *Lithothamnion graciale* covers the rock surface. The limpet *Patella vulgata* can be found grazing the rock surface, while the whelk *Nucella lapillus* is preying on the limpets, barnacles and mussels.

Classification

EUNIS (v1405):

Level 4. A sub-habitat of 'Atlantic infralittoral rock' (A3.1).

Annex 1:

1170 Reefs

MAES:

Marine - Marine inlets and transitional waters

Marine - Coastal

MSFD:

Shallow sublittoral rock and biogenic reef

EUSeaMap:

Shallow photic rock or biogenic reef

IUCN:

9.2 Subtidal rock and rocky reefs

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

Unknown

Justification

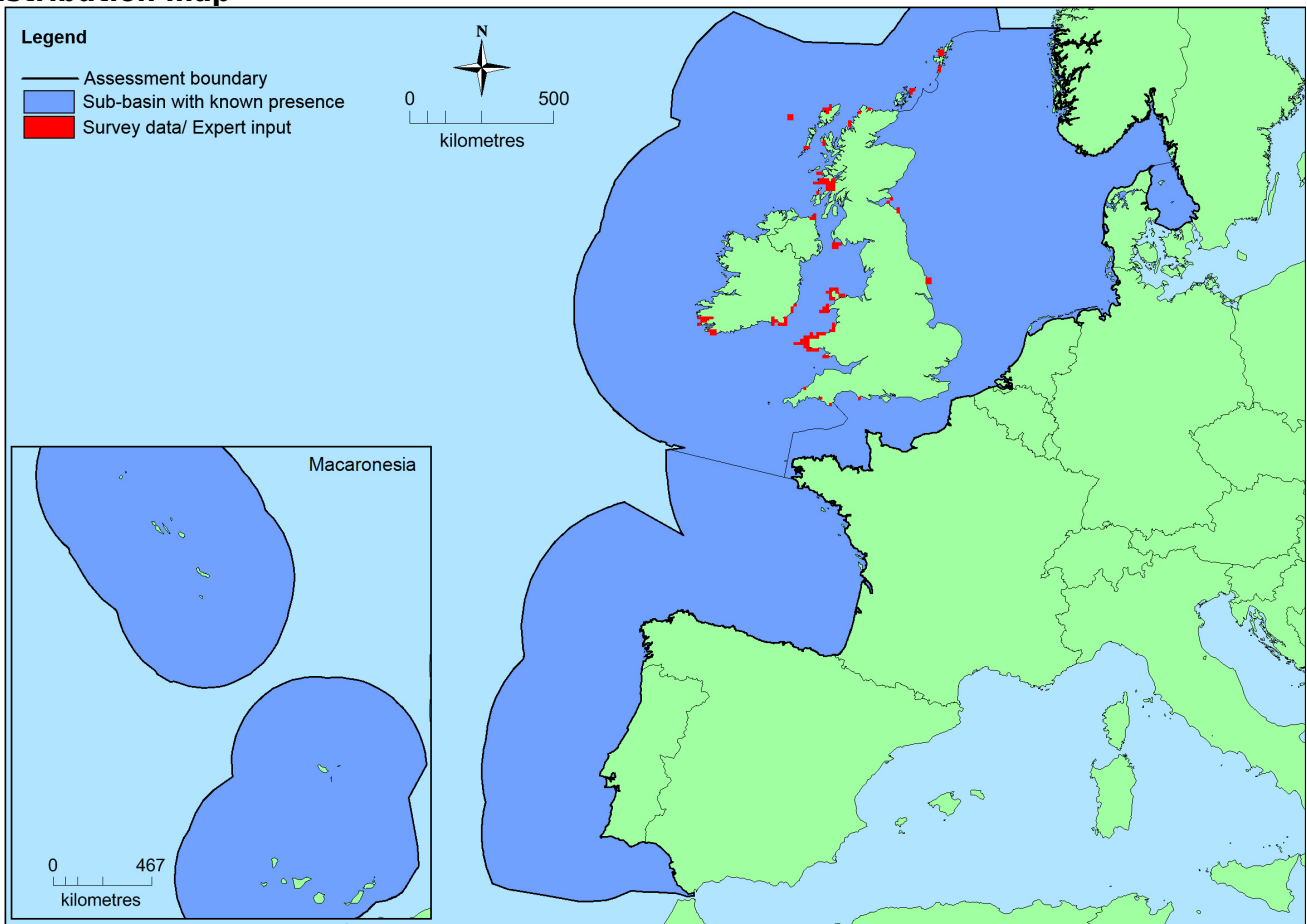
Geographic occurrence and trends

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: Uncertain	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	1,921,515 Km ²	224	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+	>1,921,515 Km ²	>224	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

There is insufficient information to determine overall trends in quantity but some localised trend data. For example there has been a reduction in the extent of *S.polyschides* and *L.ochroleuca* forest on the north-

west coast of Spain of nearly 1,400 ha over the last 30 years. Formerly dense stands of kelp are now reduced to small patches of isolated individuals east of Cape Penas, a change which has been attributed to increases in both summer and winter mean sea surface temperature.

- 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 with examples as widely separated as the remote island of Rockall to the west of the British Isles and the Channel coast of France.

- 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 with examples as widely separated, as the remote island of Rockall to the west of the British Isles and the Channel coast of France.

Trends in quality

There is insufficient information to determine overall trends in quality but some localised trend data. For example, the disappearance of *L.ochroleuca* and other canopy forming species on the Asturias coast of Spain and at the same time an increased importance of understory taxa has reduced the vertical structure of the system. This is believed to have negatively influenced both habitat availability and diversity.

- Average current trend in quality

EU 28: Unknown

EU 28+: Unknown

Pressures and threats

Harvesting of kelp beds is the most direct pressure on this habitat. Indirectly, climate change may lead to a change in the dominant species of kelp characterising this habitat. The kelp species of Western Europe have relatively limited geographical ranges, which suggests that they are stenothermal and as such unable to tolerate large fluctuations in temperature. *Laminaria hyperborea* grows in a temperature range of 0°C–15°C, whereas *Saccorhiza polyschides* grows between 3°C–24°C. *Alaria esculenta* is tolerant of temperatures up to 16 °C. Seasonal adaptations to temperature tolerance do occur, though increased temperatures during the winter months, are less well tolerated than increased temperatures during the summer months. Increased mean sea surface temperature on the North West coast of Spain over the last 30 years has been proposed as the likely cause of the reduction of *S.polyschides* and *L.ochroleuca* forests to small patches of isolated individuals.

List of pressures and threats

Biological resource use other than agriculture & forestry

Fishing and harvesting aquatic resources

Climate change

Changes in biotic conditions

Migration of species (natural newcomers)

Conservation and management

The main approach to the conservation of this habitat is through regulation of the harvesting of kelp. Measures to combat the effects of climate change (sea temperature and sea level rise) will also be beneficial.

List of conservation and management needs

Measures related to marine habitats

Other marine-related measures

Measures related to spatial planning

Establish protected areas/sites

Measures related to hunting, taking and fishing and species management

Regulation/Management of fishery in marine and brackish systems

Conservation status

Annex 1-type

1170: MATL U2, MMAC FV

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

Perennial species of kelp have a fast recovery potential but in North West Spain, where increased sea surface temperatures led to significant loss, recovery of *L. ochroleuca* forest was only observed at depth four years after a decline in both shallow and deeper waters.

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

There is insufficient information to determine any overall trends in quantity of this habitat in the North East Atlantic. This habitat has 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 The precise extent is unknown

however as EOO >50,000 km² 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 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
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

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Date of review

14/01/2016

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