

## A3.21: Kelp and red seaweeds on moderate energy Atlantic infralittoral rock

### Summary

This habitat is found on infralittoral rock in areas subject to moderate wave exposure, or on more sheltered coasts in areas subject to moderately strong tidal streams. It also occurs on carbonate-cemented structures known as 'bubbling reefs' in the Kattegat. Kelp forests develop in these situations and both the rock surfaces and kelp holdfasts and stipes are typically colonised by other algae. The most conspicuous sessile fauna include ascidians, bryozoans, echinoderms, crustaceans, and bryozoans.

Urbanisation is thought to have the most disrupting effects on kelps and other canopy-forming algae, particularly by affecting water clarity and quality as well as other habitat-related changes. Harvesting is also an pressure in some northern European countries. The habitat is also vulnerable to changes in wave exposure and tidal flow and it has been suggested that climate driven changes in the species composition of kelp forests, leading to more mixed canopies, may reduce resistance to storm damage. Several of the characteristic species of the habitat are known to be intolerant of synthetic chemical contamination.

Beneficial management and conservation measures for this habitat, include the establishment of Special Areas of Conservation, kelp harvesting management, water quality improvement programmes and the control of chemical outfalls, nearby dredging, coastal development and the construction of hard coastal defence structures.

### Synthesis

Survey information confirms that this habitat has a widespread distribution 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. 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

Submarine structures made by leaking gases.

### Habitat Type

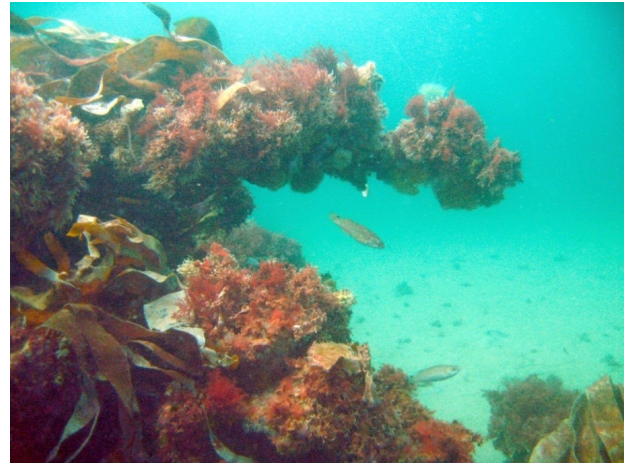
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#### Code and name

A3.21: Kelp and red seaweeds on moderate energy Atlantic infralittoral rock



Infralittoral rock habitat with understory of *Laminaria hyperborea* kelp forest and red seaweeds (© C.Wood/Marine Conservation Society).



'Bubbling reef' columns colonised by foliose red algae and kelp, Kattegat (© Orbicon)

## Habitat description

This habitat is found on infralittoral rock in areas subject to moderate wave exposure, or on more sheltered coasts in areas subject to moderately strong tidal streams. Kelp forests develop in these situations and both the rock surfaces and kelp holdfasts and stipes are typically colonised by other algae. These are predominantly red algae with good variety of delicate filamentous types. The most conspicuous sessile fauna include ascidians, bryozoans, echinoderms, crustaceans, 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. The depth limit of kelp and/or red seaweeds is used in some countries as a Water Framework Directive parameter for assessing ecological status.

Characteristic species:

On bedrock and stable boulders there is typically a narrow band of kelp *Laminaria digitata* in the sublittoral fringe which lies above a *Laminaria hyperborea* forest and park. Other seaweeds typically present include *Saccharina latissima*, *Delesseria sanguinea*, *Plocamium cartilagineum*, *Phycodrys rubens*, *Corallinaceae* and *Dictyota dichotoma*. Characteristic fauna include *Halichondria panacea*, *Urticina felina*, *Pomatoceros triqueter*, *Gibbula cineraria*, *Asterias rubens*, and, *Echinus esculentus* as well as bryozoans *Membranipora membranacea* and *Electra pilosa*.

## Classification

EUNIS (v1405:

Level 4. A sub-habitat of 'Atlantic infralittoral rock' (A3.2).

Annex 1:

1170 Reefs

1180 Submarine structures made by leaking gas

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

9.7 Macroalgal/kelp

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

Yes

Regions

Atlantic

Justification

Rocky coasts with this specific composition of kelp and seaweeds are only characteristic for several North East Atlantic sub-regions. It does not occur in the Black Sea, Baltic Sea or the Mediterranean Sea.

## Geographic occurrence and trends

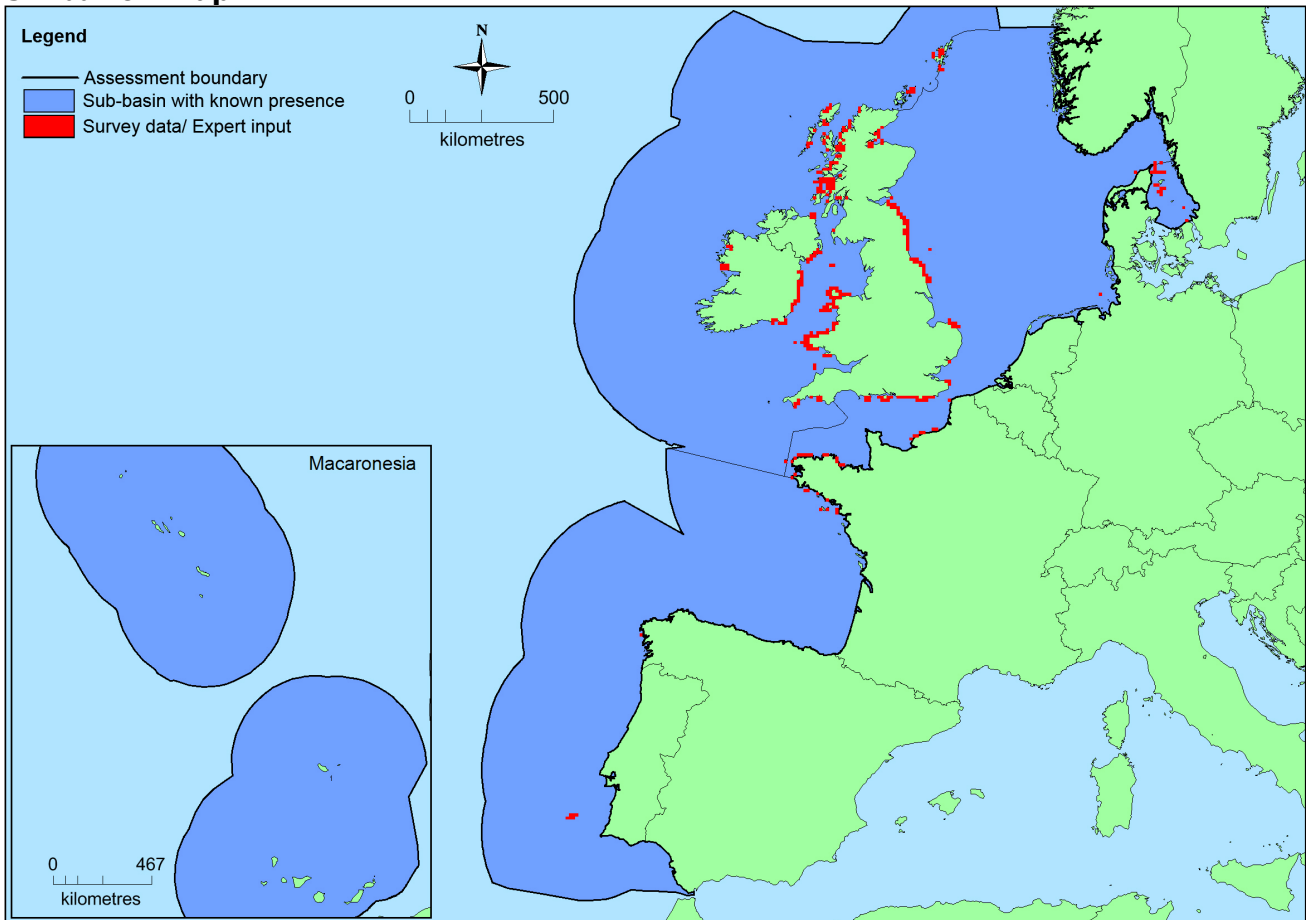
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Region	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
<i>North-East Atlantic</i>	Bay of Biscay and the Iberian Coast: Present Celtic Seas: Present Kattegat: Present Greater North Sea: Present Macaronesia: Present	Unknown Km <sup>2</sup>	Unknown	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>	1,825,638 Km <sup>2</sup>	579	Unknown Km <sup>2</sup>	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.
<i>EU 28+</i>	>1,825,638 Km <sup>2</sup>	>579	Unknown Km <sup>2</sup>	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**

This habitat 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. Locations of 'bubbling reefs' in the Kattegat and Skagerrak have long been known to fishermen due to fragments of the pillars becoming entangled in the nets.

- 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, from the Skagerrak in the east, to the north western coast of Spain.

- 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, from the Skagerrak in the east, to the north western coast of Spain.

### **Trends in quality**

This habitat 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 quality.

- Average current trend in quality

EU 28: Unknown

EU 28+: Unknown

### **Pressures and threats**

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Urbanisation is thought to have the most disrupting effects on kelps and other canopy-forming algae, particularly by affecting water clarity and quality as well as other habitat-related changes. In some northern European regions, including the west coast of Norway, the French channel coast and parts of the U.K. coast, harvesting is also an issue, which has the most direct pressure on this habitat. Removal of *L. digitata* or *L. hyperborea* would also result in a loss of a large proportion of the associated fauna.

Abrasion from bottom towed gears is also known to impact this habitat with trawling, bottom trawling or other fishing methods

the major threat to bubbling reefs. Recreational activities such as SCUBA diving and other recreational activities may also potentially harm the reef structures. Careless movements of the divers or divers touching the underwater structures could cause them to break.

The habitat is also vulnerable to changes in wave exposure and tidal flow; once detached most of the characterising flora and fauna cannot re-attach and would be swept away. Species abundance and diversity will be significantly reduced because the additional habitats and refugia provided by kelp fronds,

stipes and particularly the holdfast will be lost. Climate driven changes in the species composition of kelp forests, leading to more mixed canopies, may also reduce resistance to storm damage.

Several of the characteristic species of the biotope are known to be intolerant of synthetic chemical contamination.

## **List of pressures and threats**

### **Urbanisation, residential and commercial development**

Urbanised areas, human habitation

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

Fishing and harvesting aquatic resources

### **Pollution**

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

Nutrient enrichment (N, P, organic matter)

Marine water pollution

Oil spills in the sea

Toxic chemical discharge from material dumped at sea

### **Natural System modifications**

Human induced changes in hydraulic conditions

### **Climate change**

Changes in abiotic conditions

Temperature changes (e.g. rise of temperature & extremes)

## **Conservation and management**

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The main approaches to the conservation and management of this habitat could be through control of seaweed harvesting, the management of activities that damage or disturb seabed communities, or that change the hydrological regime, such coastal development and the construction of hard coastal defence structures. In addition, the maintenance of controls of chemical discharges from outfalls to reduce the risk of contamination effects should also be considered. Such measures may be introduced within the framework of Marine Protected Areas.

## **List of conservation and management needs**

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

Restoring/Improving water quality

### **Measures related to marine habitats**

Other marine-related measures

### **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:

1170: MATL U2 , MMAC FV

1180: MATL XX, MMAC XX.

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

The capacity for this habitat to recover once severely damaged is unknown.

**Effort required**

**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 also there is known to have been damage to some of the associated biotopes in some locations ('bubbling reefs'). 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 <sup>2</sup>	Unknown	Unknown	No	>50	Unknown	Unknown	No	No
EU 28+	>50,000 Km <sup>2</sup>	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<sup>2</sup> 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
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

North East Atlantic Working Group: S. Gubbay, G. Saunders, H. Tyler-Walters, N. Dankers, F. Otero, J. Forde, K. Fürhaupter, R. Haroun Tabraue, N. Sanders.

### Contributors

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### Reviewers

K. Fürhaupter.

### Date of assessment

28/12/2015

### Date of review

08/01/2016

### References

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HELCOM Biotope information sheet

<http://helcom.fi/Red%20List%20of%20biotopes%20habitats%20and%20biotope%20complexe/HELCOM%20Red%20List%201180%20Submarine%20structures%20made%20by%20leaking%20gases.pdf> [Accessed March 2016]

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