

## A3.22 Kelp and seaweed communities in tide-swept sheltered Atlantic infralittoral rock

### Summary

This is a species-rich, structurally complex habitat that develops in areas of infralittoral rock sheltered from wave action but exposed to strong tidal streams. It has a wide range being found on the Atlantic coast of France, the west coast of Ireland, the north coast of Scotland and within Norwegian fjords. Because this habitat is present in sheltered locations, such as narrow channels in sea lochs and fjords, it is vulnerable to changes in wave exposure and tidal flow. This may result from coastal works such as the construction of bridges and causeways, as well as tidal power generation schemes, land claim, and dredging. 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 and in some northern European regions harvesting is also an issue. Controls on such activities, for example through spatial planning regulation, have been introduced where this habitat occurs both within and outside Marine Protected Areas.

### 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

None.

### Habitat Type

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#### Code and name

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Kelp and seaweed communities in tide-swept infralittoral rock. Loch Bracadale, Skye, Scotland (© I.Fuller/JNCC).

## Habitat description

This is a species-rich, structurally complex habitat that develops in areas of infralittoral rock sheltered from wave action but exposed to strong tidal streams such as the sheltered narrows and sills of Scottish sea lochs or in Norwegian fjords. In the sublittoral fringe dense *Laminaria digitata* is found together with erect seaweeds, sponges, ascidians and bryozoans. Below this, on bedrock and stable boulders a canopy of mixed kelp (primarily *Laminaria hyperborea* and *Saccharina latissima*) occurs with foliose red seaweeds, sponges and ascidians. In some situations, for examples on mixed substrata of boulders, cobbles, pebbles and gravel, there may be a reduced kelp canopy of *L. hyperborea* and *S. latissima*, but with a rich red seaweed component and maerl at some sites. Where the tide-swept rock occurs in estuarine conditions, the reduced and variable salinity as well as increased turbidity of the water has a significant effect on the biota, limiting the infralittoral zone to very shallow depths. The rock in these situations is characterised by a relatively low abundance of *S. latissima* with foliose red seaweeds, sponges and ascidians. *L. hyperborea* is rarely present.

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:

Tide-swept algal communities dominated by dense stands of kelp, together with a high diversity of red seaweeds, e.g. *Plocamium cartilagineum*, *Heterosiphonia plumose*, *Cryptopleura ramose*, *Delesseria sanguinea* and *Phycodrys rubens*. The brown seaweed *Dictyota dichotoma* may also be frequent. The strong water flow supports a wide variety of sessile animals such as anthozoans, sponges, sea squirts and sea mats on both the bedrock and the seaweeds. They include *Urticina felina*, *Alcyonium digitatum*, *Pachymatisma johnstonia*, *Clavelina lepadiformis*, and *Botryllus schlosseri*. In the sublittoral fringe, oarweed (*Laminaria digitata*) dominates while on the tide scoured rock of sea loch sills and narrows, dense cuvie (*Laminaria hyperborea*) and sugar kelp (*Saccharina latissima*) forests form. In areas of boulders and gravel, the kelp canopy is less dense but with a greater diversity of red seaweeds and occasionally maerl. Invertebrate species that characterise the habitat include *Cancer pagurus*, *Calliostoma zizyphinum*,

*Asterias rubens*, *Echinus esculentus* and *Balanus crenatus*.

## Classification

EUNIS (v1405):

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

Annex 1:

1160 Large shallow inlets and bays

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 ecosystem:

9.2 Subtidal rock and rocky reef

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

Yes

Regions

Atlantic

Justification

Tide swept rocky coasts with this specific composition of kelp and seaweeds are only characteristic for several North East Atlantic biogeographic regions. It neither occurs in the Black Sea, Baltic Sea nor in the Mediterranean Sea.

### **Geographic occurrence and trends**

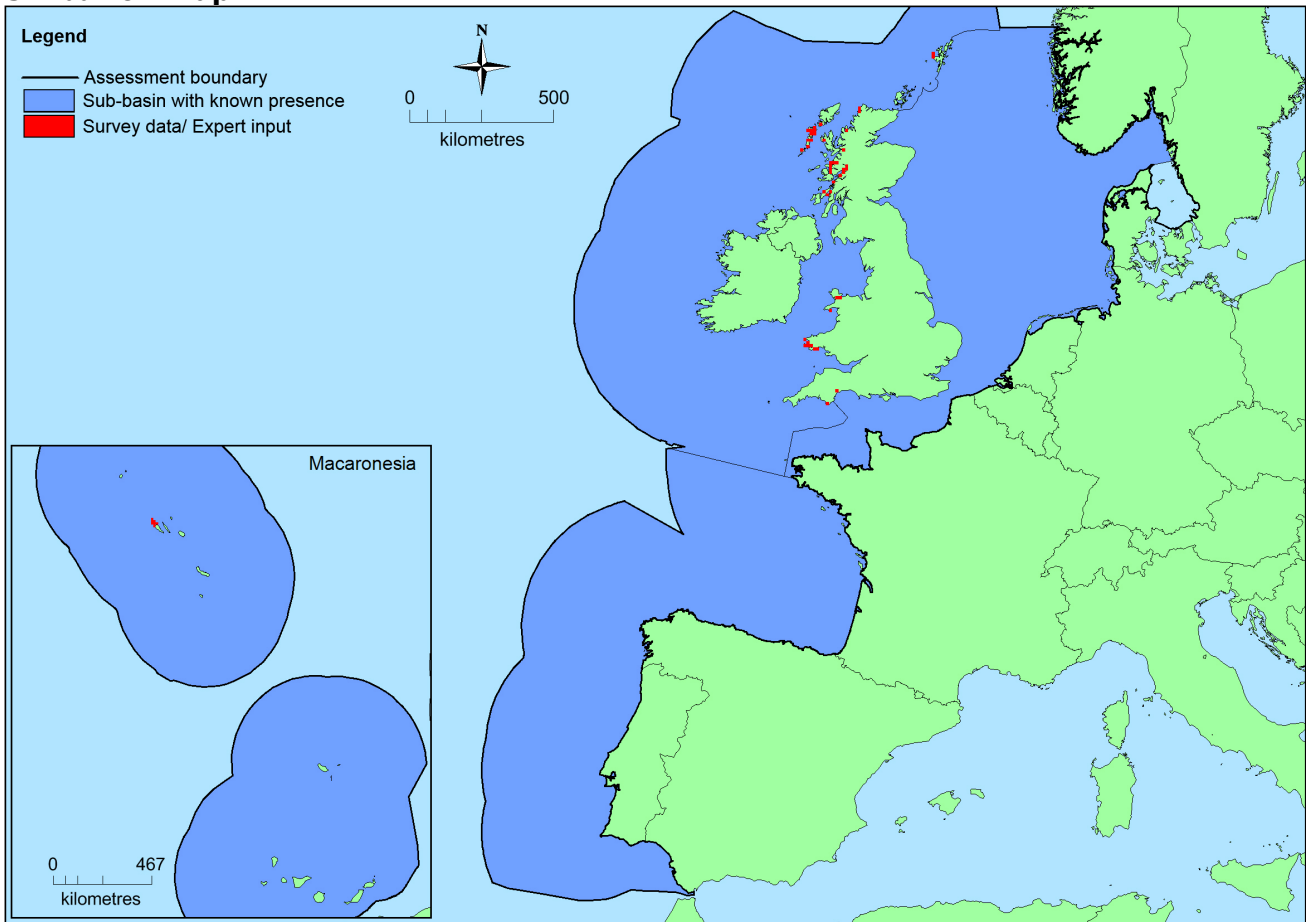
Region	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
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Region	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
<i>North-East Atlantic</i>	Bay of Biscay and the Iberian Coast: Present Celtic Seas: Present Greater North Sea: Present Macaronesia: Present Kattegat: Uncertain	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>	1,161,730 Km <sup>2</sup>	57	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>	>1,161,730 Km <sup>2</sup>	>57	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.

- 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 does not have a small natural range.

- 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.

### **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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Because this habitat is present in sheltered locations, such as narrow channels in sea lochs, it is vulnerable to changes in wave exposure and tidal flow. This may result from coastal works such as the construction of bridges and causeways, as well as tidal power generation schemes, land claim, and dredging. Although the currents in rapids may quickly disperse one-off sources of pollution, chronic continuing pollution could affect sensitive marine life.

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 UK coast, harvesting is also an issue.

### **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

## Natural System modifications

- Human induced changes in hydraulic conditions
  - Modification of hydrographic functioning, general
  - Modification of water flow (tidal & marine currents)

## Conservation and management

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Controls on activities that change the hydrological regime, such as coastal construction works, tidal energy generation schemes and land claim are important for the conservation of this habitat. These types of measures have been introduced where this habitat occurs both within and outside marine protected areas.

### List of conservation and management needs

#### Measures related to marine habitats

- Other marine-related measures

#### Measures related to spatial planning

- Establish protected areas/sites

### Conservation status

Annex 1:

1160: MATL U2, MMAC FV

1170: MATL U2, MMAC FV

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

Unknown.

### Effort required

## Red List Assessment

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### 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. It is therefore assessed as Data Deficient under criterion A.

### 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%	uUnknown %	Unknown%	uUnknown %	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

S. Gubbay.

## Contributors

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

## Reviewers

K. Fürhaupter.

## Date of assessment

25/08/2015

## Date of review

22/12/2015

## References

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