A5.52 Kelp and seaweed communities on Atlantic infralittoral mixed sediment

Summary

This habitat consists of shallow sublittoral mixed sediments including larger stones and pebbles, which support seaweed communities, typically including the kelp *Saccharina latissima* the bootlace weed *Chorda filum* and various red and brown seaweeds, particularly filamentous types.

This habitat is vulnerable to inshore fishing activity where trawls, dredges or the laying and recovery of creels may disturb, damage or remove the epibiota, in particular the characterising seaweed species. Disturbance or removal of the substratum together with an associated increase in sediment loading resulting from dredging activities, is a serious threat to the habitat biota, by reducing critical light penetration to seaweeds and providing a competitive advantage to filter feeding fauna which compete with the algal species for space. In addition, pollution and nutrient enrichment is a significant pressure that can lead to declines in species richness.

Beneficial management and conservation measures for this habitat include: protection within Marine Protected Areas, regulation of nutrient discharges, the regulation of fishing methods which damage, or disturb seabed communities, the control of dredging activity, 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 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 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

Loose-lying mats of *Phyllophora crispa* on infralittoral muddy sediment.

Habitat Type

Code and name

A5.52 Kelp and seaweed communities on Atlantic infralittoral mixed sediment

Seaweed communities on mixed sediment with *Saccharina latissima* and *Chorda filum* visually dominant. Drawna Rocks, UK (© K.Hiscock).

A mix of red and brown algae on infalittoral mixed sediment. Drawna Rocks, UK (© K.Hiscock).

Habitat description

Shallow sublittoral mixed sediments consisting of hard substrate components (cobbles, pebbles, gravel and shells) in various densities which support seaweed communities, typically including the kelp *Saccharina latissima* the bootlace weed *Chorda filum* and various red and brown seaweeds, particularly filamentous types. The environmental conditions also dictate the typical seaweed communities present. In areas where winter storms are common, seaweed cover will be more ephemeral and fragmented, due to high mortality rates from damage and detachment; whilst in more sheltered areas, long term attachment to smaller cobbles/pebbles is possible. Loose mats may be present in the most sheltered environments. The strength of tidal flow and type of substrate also influence the community type.

A diverse array of animals is associated with these kelps and seaweeds, including burrowing polychaete worms and bivalves, scavenging hermit crabs, crabs, starfish, fish and grazing top shells. Kelps and seaweeds growing on sediment greatly increase the primary production of an area and create a more diverse habitat. Gastropods, amphipods, sea urchins and fish graze the seaweeds; starfish, urchins, hermit crabs and crabs are scavengers; crabs and fish are opportunistic predators; and a mixed infauna of deposit feeders and suspension feeders develops, depending on sediment type. Various biotopes have been described associated with this habitat characteristised by *Saccharina.latissima, Chorda.filum* and red seaweeds on sheltered muddy sediments as well as mats of *Trailliella* on muddy gravel and loose-lying mats of *Phyllophora crispa* on muddy sediment.

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:

Saccharina latissima, *Chorda filum* various red seaweeds like *Phycodrys rubens*. Zoobenthos reported at a high frequency and/or abundance include *Mediomastus fragilis, Ampelisca brevicornis, Capitella capitata, Heterochaeta costata, Tubificoides benedii, Mysella bidentata, Pagurus bernhardus, Liocarcinus depurator, Asterias rubens,*

Classification

EUNIS (v1405):

Level 4. A sub-habitat of ‘Atlantic shallow/infralittoral coarse sediment’ (A5.5).

Annex

1160 Large shallow inlets and bays

MAES:

Marine - Marine inlets and transitional waters

Marine - Coastal

MSFD:

Shallow sublittoral mixed sediment

EUSeaMap:

Shallow coarse or mixed sediments #

IUCN:

9.3 Subtidal loose rock/pebble/gravel

9.7 Macroalgal/Kelp

9.10 Estuaries

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

No

Justification

Mixed substrates dominated by *S. saccharina*, *Chorda filum* or other red and brown seaweeds are characteristic for several regional seas.

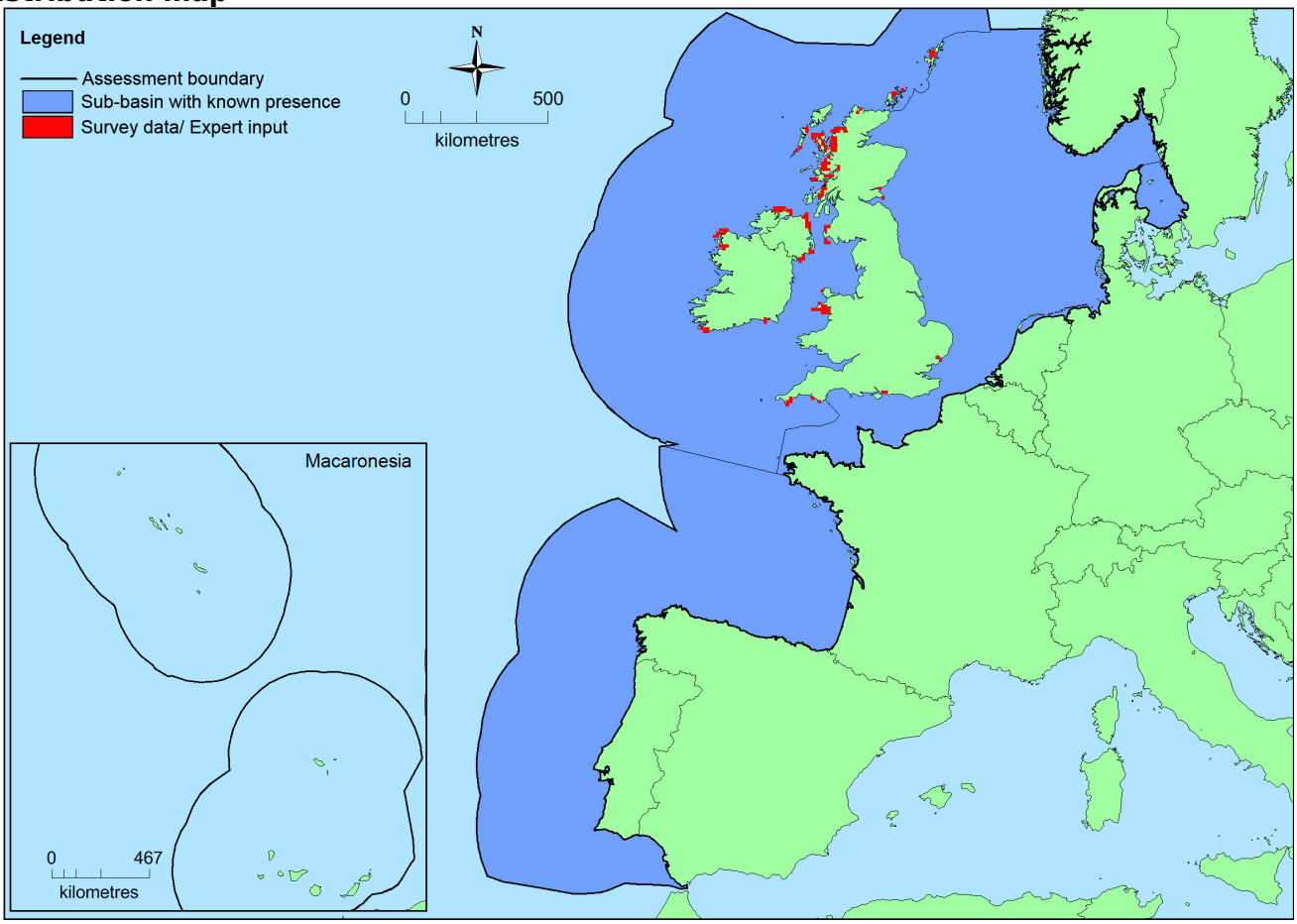
Geographic occurrence and trends

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 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	590,514 Km^2	172	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+	>590,514 Km^2	>172	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). The percentage hosted by EU 28 is therefore less than 100% but there is insufficient information to establish the proportion.

Trends in quantity

There is insufficient information to determine whether there have been any historical, recent and possible

future trends in quantity of this habitat.

- 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.
- 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.

Trends in quality

There is insufficient information to determine whether there have been any historical, recent and possible future trends in quality of this habitat.

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

Pressures and threats

This habitat is vulnerable to inshore fishing activity where trawls, dredges or the laying and recovery of shellfish creels/pots may disturb damage or remove the epibiota, in particular the characterising seaweed species. Disturbance or removal of the substratum, together with an associated increase in sediment loading resulting from dredging activities, will pose a serious threat to the habitat biota, by reducing critical light penetration to seaweeds and providing a competitive advantage to filter feeding fauna which compete with the algal species for space.

Kelps are fairly tolerant of hydrocarbon pollution and have a high recovery potential due to its ability to produce protective mucus secretions. Other typical species associated with this habitat are, however, considerably more sensitive and so a decline in species richness can be expected where spillages occur. In addition, a slight increase in nutrients from agricultural run-off, aquaculture activities or storm drain or domestic discharges may enhance the growth of *S. latissima*, but higher levels, may, however, stimulate dominance and over-growth of ephemeral green algae.

List of pressures and threats

Biological resource use other than agriculture & forestry

Marine and Freshwater Aquaculture
Fishing and harvesting aquatic resources
Professional active fishing
Benthic or demersal trawling
Benthic dredging

Pollution

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

Natural System modifications

Human induced changes in hydraulic conditions
Removal of sediments (mud...)

Conservation and management

This habitat is afforded some protection within some Marine Protected Areas. Beneficial management measures include the control of bottom-contact fishing activity, the regulation of dredging, aquaculture and the construction of hard coastal defence structures. Additionally, water quality improvement programmes to reduce the risk of toxic contamination or nutrient inputs leading to eutrophication should also be considered.

List of conservation and management needs

Measures related to wetland, freshwater and coastal habitats

Restoring/Improving water quality
Restoring/Improving the hydrological regime

Measures related to spatial planning

Establish protected areas/sites

Measures related to urban areas, industry, energy and transport

Urban and industrial waste management

Conservation status

Annex 1:

1160: MATL U2, MMAC FV

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

Removal of the substratum will remove most of the key species of this feature, although if suitable substratum remains, recovery is likely to be rapid as most of the epibiota species are known to be rapid colonizers and fast growing. Sediment infauna are probably slower to re-colonise and develop into a stable community. Some species such as *Cerianthus lloydii* may be very slow to re-establish after disturbance. Overall, because of the dominance of rapid settling and fast growing species, such as *S.latissima* and *C.filum,* some of the elements can recover rapidly but establishment of a community containing the range of characteristic species associated with an undisturbed and mature community may take several years.

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 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. 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) and B3 and Data Deficient for all other criteria for both the EU 28 and EU 28+.

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. This habitat has therefore been assessed as Data Deficient under criteria C/D1.

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)

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