

A5.33 Marine Atlantic infralittoral sandy mud

Summary

This habitat is generally found in sheltered bays or marine inlets and along sheltered areas of open coast. Typical it supports a rich variety of polychaetes, tube building amphipods and deposit feeding bivalves. Sea pens may be present but not in the same abundances as found in deeper circalittoral waters.

The main pressures and threats to this habitat are associated with demersal fisheries, aquaculture, coastal constructions such as bridges and barrages that can may affect the local hydrodynamic and sediment transport regimes. Nutrient enrichment leading to eutrophication can lead to changes in the structure and composition of the associated communities.

This habitat can benefit from the regulation of the use of fishing gears that damage or disturb seabed communities. This may be spatial and temporal controls as well as regulation of gear design and deployment. Marine Protected Areas and spatial planning (including zoning) can be used to address potential threats from coastal development and fish farming, while the regulation of discharges and run off from agricultural land to the marine environment can be used to avoid eutrophication effects associated with nutrient enrichment.

Synthesis

This habitat has a widespread distribution. There are no precise figures on its extent of however a combination of survey data and modelling indicates that it cannot be considered to have a restricted geographical distribution nor to occur in only a few locations in the North East Atlantic.

Most sedimentary benthic systems on the continental shelf of Europe have been modified by fishing activities in the last 100 years and this pressure continues today. There is a lack of comprehensive data however expert opinion is that this habitat should be assessed as Near Threatened for both the EU 28 and EU 28+ because of both past and likely future declines in quality.

Overall Category & Criteria			
EU 28		EU 28+	
Red List Category	Red List Criteria	Red List Category	Red List Criteria
Near Threatened	C/D1	Near Threatened	C/D1

Sub-habitat types that may require further examination

None.

Habitat Type

Code and name

A5.33 Marine Atlantic infralittoral sandy mud

No characteristic photographs of this habitat currently available.

Habitat description

Infralittoral, cohesive sandy mud, typically with over 20% silt/clay, in depths of less than 15-20 m. This habitat is generally found in sheltered bays or marine inlets and along sheltered areas of open coast. Tidal streams can vary from negligible to moderately strong (1-3kn). Six associated biotopes have been identified dominated by different species.

Indicators of quality:

Both biotic and abiotic indicators have been used to describe marine habitat quality. These include; the presence of characteristic species (especially those which are sensitive to the pressures the habitat may face), water quality parameters, levels of exposure to particular pressure as well as 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.

Key driving influences and output processes of shallow sublittoral mud habitats that are likely to be sensitive to pressures and may be useful for monitoring to identify anthropogenic causes of change include habitat structure changes, removal of particular species such as those which are key in bioturbation and biodeposition, or nutrient and biogeochemical cycling, changes in siltation rates and organic enrichment.

Characteristic species:

Typical species include a rich variety of polychaetes including *Melinna palmate*, tube building amphipods (*Ampelisca* spp.) and deposit feeding bivalves such as *Macoma balthica* and *Mysella bidentata*. Sea pens such as *Virgularia mirabilis* and brittlestars such as *Amphiura* spp. may be present but not in the same abundances as found in deeper circalittoral waters. Other species which may be abundant or frequent include *Scoloplos armiger*, *Chaetozone gibber*, *Capitella capitata*, *Euclyene oerstedii*, *Melinna palmate*, *Ampelisca brevicornis*, *A. teuicornis*, and *Ascidella aspersa*. Mobile species include *Pagurus bernhardus*, *Liocarcinus depurator*, *Carcinus maenas*, and *Nucula nitidosa*.

Classification

EUNIS (v1405):

Level 4. A sub-habitat of 'Atlantic shallow/infralittoral mud' (A5.3).

Annex 1:

1160 Large shallow inlets and bays

MAES:

Marine - Marine inlets and transitional waters

Marine - Coastal

MSFD:

Shallow sublittoral mud

EUSEaMap :

Shallow mud

IUCN:

9.6 Subtidal muddy

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 and common in the North East Atlantic region.

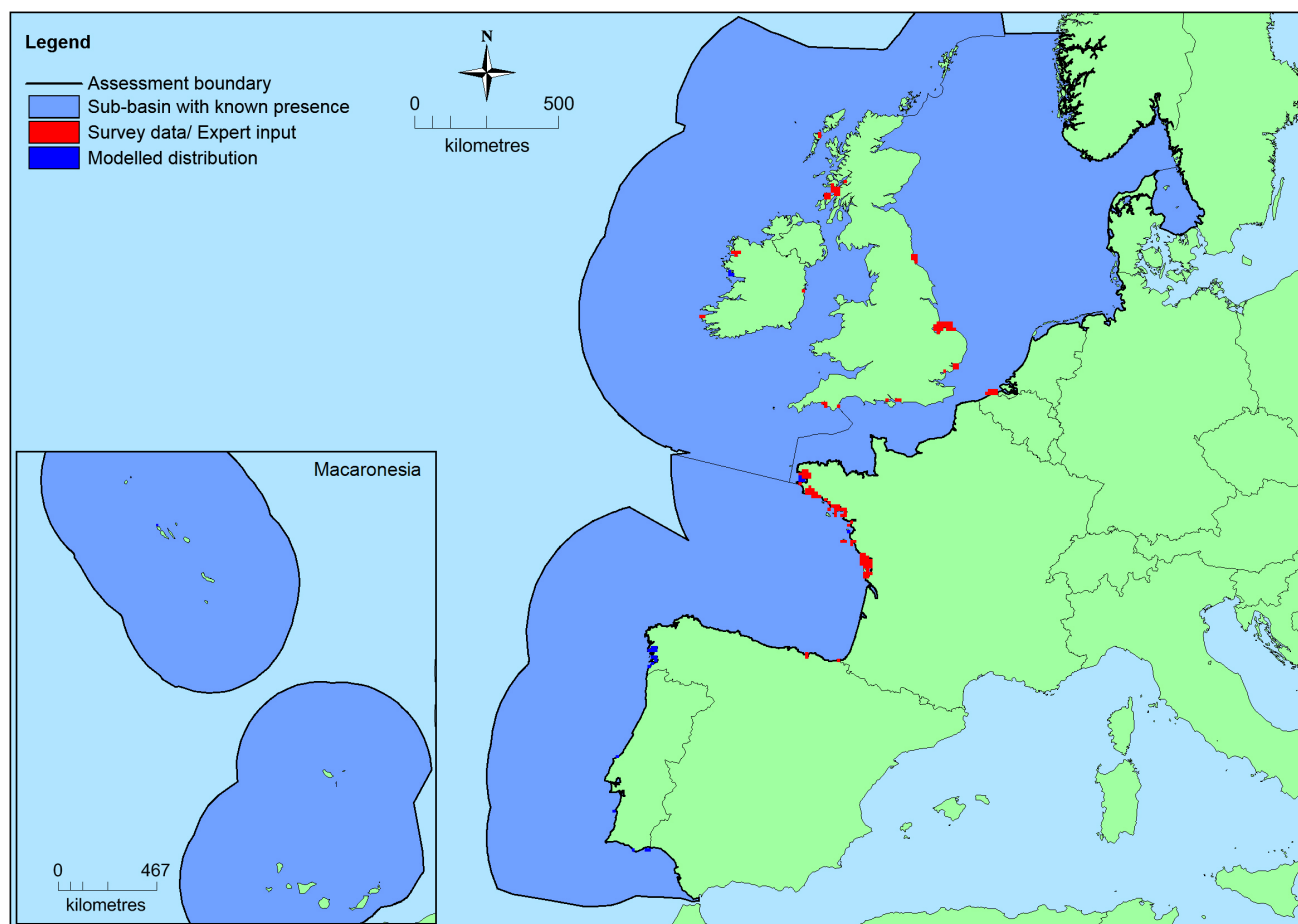
Geographic occurrence and trends

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 Macaronesia: Present	Unknown Km ²	Unknown	Decreasing

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>	3,172,859 Km ²	177	>354 Km ²	The area estimate for this habitat has been derived from a synthesis of EUNIS seabed habitat geospatial information for the European Seas but is recognised as being an underestimate.
<i>EU 28+</i>	>3,172,859 Km ²	>177	>354 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

Estimates of the area and extent of this habitat show considerable variation and are recognised as being biased and an underestimate. Trends in quantity cannot be determined with any accuracy at the present time.

- 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 (>50,000km²)

- 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 (>50,000km²)

Trends in quality

Most sedimentary benthic systems on the continental shelf of Europe have been modified by fishing activities in the last 100 years, particularly by bottom trawls and dredging/ In the German part of the Greater North Sea, more than 80% of the extent of this habitat is believed to have suffered an intermediate decline over the last 50 years. In the Kattegat, 38% of the area of "combination sediments" was affected by trawling over a 3 year study period but mostly trawled less than twice a year and considered to have a high recoverability. 41% of the area of muddy sediments was trawled and considered to be permanently disturbed. The North Sea and Celtic Sea are likely to have been subject to similar pressures and threats over the same time period, it is likely that there has also been a decline in quality in these locations.

- Average current trend in quality

EU 28: Decreasing

EU 28+: Decreasing

Pressures and threats

Dermesal fishing activity is the main pressure and threat to this benthic habitat. Generally, studies have found that long-living, sessile and suspension-feeding organisms show the greatest declines in response to a given type and frequency of trawl disturbance while opportunistic species, e.g. short-living polychaetes, are less affected. The response of a benthic community to trawling will also depend on the pre-fished composition of the community which is largely affected by the degree of natural disturbance, due to currents, waves or storms.

Near the coast marine fish farms may have direct effects on sandy mud communities, including smothering and increasing the Biological Oxygen Demand of the mud. Additional effects may result from the discharges of chemicals, some of which are especially toxic to crustaceans. The construction of roads, bridges and barrages may affect the local hydrodynamic and sediment transport regimes of inshore enclosed areas and consequently affect the substratum. Nutrient enrichment leading to eutrophication can lead to changes in the structure and composition of the associated communities.

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

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

Conservation and management

This habitat can benefit from the regulation of the use of fishing gears that damage or disturb seabed communities. This may be achieved by spatial and temporal controls as well as gear design and

deployment using fisheries management measures as well as conservation legislation in marine protected areas. Spatial planning (including zoning) can be used to address potential threats from coastal development and fish farming and the regulation of discharges and run off from agricultural land to the marine environment can be used to avoid eutrophication effects associated with nutrient enrichment.

List of conservation and management needs

Measures related to marine habitats

Other marine-related measures

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 fishery in marine and brackish systems

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?

Timescale between incidents of damaging activity, the type of damaging activity and the predominant species, influences recovery. Studies have shown that recovery times following dredging were significantly shorter for short-lived species (<1 – 3 years), free-living and tube-dwelling species and for scavenging or opportunistic species, than for medium-lived species (3 – 10 years), burrow-dwelling species and suspension feeders. In trawled areas, recovery times were significantly shorter for free-living species, species covered by an exoskeleton or a hard tunic and species that produce pelagic or benthic eggs than for epiphytic/zoic species, species that grow attached to the substratum and have an erect or stalked body form, and species that reproduce asexually. Areas with high levels of natural disturbance have community compositions and functions that are more resilient than those found in areas with less natural disturbance.

Recovery times following oxygen depletion and pollution has been investigated in several studies of the Gullmarsfjord, Sweden showing and reported to be between 2-8 years. Differences in the recoverability of different species groups following fishing may result in changes in community composition and ecosystem functioning over the long term.

Effort required

10 years	20 years	50+ years	200+ years
Naturally	Naturally	Naturally	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 %

Estimates of the area and extent of this habitat show considerable variation and are recognised as being biased and an underestimate. No assessment of trends in quantity have therefore been made. This

habitat is assessed as Data Deficient under criteria 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	Yes	Yes	No	>50	Yes	Yes	No	No
EU 28+	>50,,000 Km ²	Yes	Yes	No	>50	Yes	Yes	No	No

This habitat has a large natural range in the North East Atlantic region and is not present at a limited number of locations. Although the extent of decline in quality cannot be quantified it is known to have occurred and the major threat (demersal fisheries) is likely to continue in the near future. The precise extent is unknown however as EOO >50,000km² and AOO >50, this exceeds the thresholds for a threatened category on the basis of restricted geographic distribution. This habitat has therefore been assessed as Least Concern under criteria B.

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	<30 %	fairly substantial %	unknown %	unknown %	unknown %	unknown %
EU 28+	<30 %	fairly substantial %	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%

Most sedimentary benthic systems on the continental shelf of Europe have been modified by fishing activities in the last 100 years. In the German part of the Greater North Sea, more than 80% of the extent of this habitat is believed to have suffered an intermediate decline over the last 50 years. No assessments have been made in other parts of this regional sea but as at least the North Sea and Celtic Sea are likely to have been subject to similar pressures and threats over the same time period, it is likely that there has also been a decline in quality in these locations. Overall the decline is estimated to be fairly substantial but likely affecting less than 30% of the habitat. This habitat has therefore been assessed as Near Threatened under criteria C/D1 for both the EU 28 and EU 28+.

Criterion E: Quantitative analysis to evaluate risk of habitat collapse

Criterion E	Probability of collapse
EU 28	unknown

Criterion E	Probability of collapse
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	NT	DD	DD	DD	DD	DD	DD	DD	DD	DD
EU28+	DD	DD	DD	DD	LC	LC	LC	NT	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
Near Threatened	C/D1	Near Threatened	C/D1

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

T. Haynes.

Date of assessment

25/08/2015

Date of review

15/04/2016

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