A5.24 Marine Atlantic infralittoral muddy sand

Summary

This habitat is found in areas sheltered from wave and tidal action and is typically present where the sediment is non-cohesive muddy sand. It extends from the lower shore down to the circalittoral at 15-20 m depth. Studies of the habitat in different parts of its geographical range, reveal seasonal cycles and responses to long-term fluctuations in ambient temperatures across the range as well as responses to small scale local phenomena such as pollution incidents.

Fishing activities, particularly the use of beam trawls, and scallop dredging are a serious threat to this habitat, because they damage and kill large infaunal and epifaunal species, and can cause a decrease in sessile polychaetes. In addition, discharges of waste water and solid waste from aquaculture, synthetic compound contamination and hydrocarbon contamination are likely to lead in a decline in species richness. Moreover changes in the water flow rate will change the sediment structure and have subsequent effects on the community.

Beneficial management and conservation measures for this habitat include: protection within marine protected areas, integrated coastal management, regulation of fishing activity which damage, or disturb seabed communities, water quality improvement programmes, control of discharges, regulation of dredging and the regulation and control of coastal development and the construction of hard coastal defence structures.

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 does not have a restricted geographical distribution or 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, particularly bottom trawls and dredging, in the last 100 years and this habitat remains under fishing pressure. There are signficant data deficiencies however expert opinion is that this habitat should be assesssed 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

A5.24 Marine Atlantic infralittoral muddy sand

No characteristic photographs of this habitat currently available.

Habitat description

This habitat is typically on a substrate of non-cohesive muddy sand (with 5% to 20% silt/clay). It occurs in the infralittoral zone, extending from the extreme lower shore down to more stable circalittoral zone at

about 15-20 m. The habitat develops on sheltered shores in fully marine conditions, or occasionally in areas subject to variable salinity. The habitat supports a variety of animal-dominated communities, particularly polychaetes, bivalves and the urchin *Echinocardium cordatum* depending on the sediment characteristics and the degree of shelter. In stable, fine, compacted sands and slightly muddy sands in the infralittoral and littoral fringe, communities occur that are dominated by venerid bivalves.

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:

Polychaetes (*Magelona mirabilis, Spiophanes bombyx* and *Chaetozone setosa*), bivalves (*Fabulina fibula* and *Chamelea gallina*) and the urchin *Echinocardium cordatum*. In sheltered areas that support populations of *E.cordatum* and the razor shell *Ensis silique* or *E.ensis* other notable taxa within the biotope include occasional *Lanice conchilega, Pagurus* and *Liocarcinus* spp. and *Asterias rubens,* venerid bivalves such as *Chamelea gallina* and depending on the biotopes a prevalence of *Fabulina fabula* and *Magelona* mirabilis or other species of *Magelona* (e.g. *M. filiformis*). Other taxa, including the amphipod *Bathyporeia* spp. and polychaetes such as *Chaetozone setosa, Spiophanes bombyx* and *Nephtys* spp. are also commonly recorded and low numbers of the bivalve *Spisula elliptica*. Also the polychaete *Arenicola marina*, *Spisula subtruncata* and *Nephtys hombergii*, *Turritella* or *Ervillia castanea.*

Classification

EUNIS (v1405):

Level 4. A sub-habitat of 'Atlantic shallow/infralittoral sand' (A5.2).

Annex 1:

1110 Sandbanks slightly covered by seawater

1160 Large shallow inlets and bays

MAES:

Marine - Marine inlets and transitional waters

Marine - Coastal

MSFD:

Shallow sublittoral sand

EUSeaMap:

Shallow sands

IUCN:

9.4 Subtidal sandy

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

Regions
Atlantic

Justification
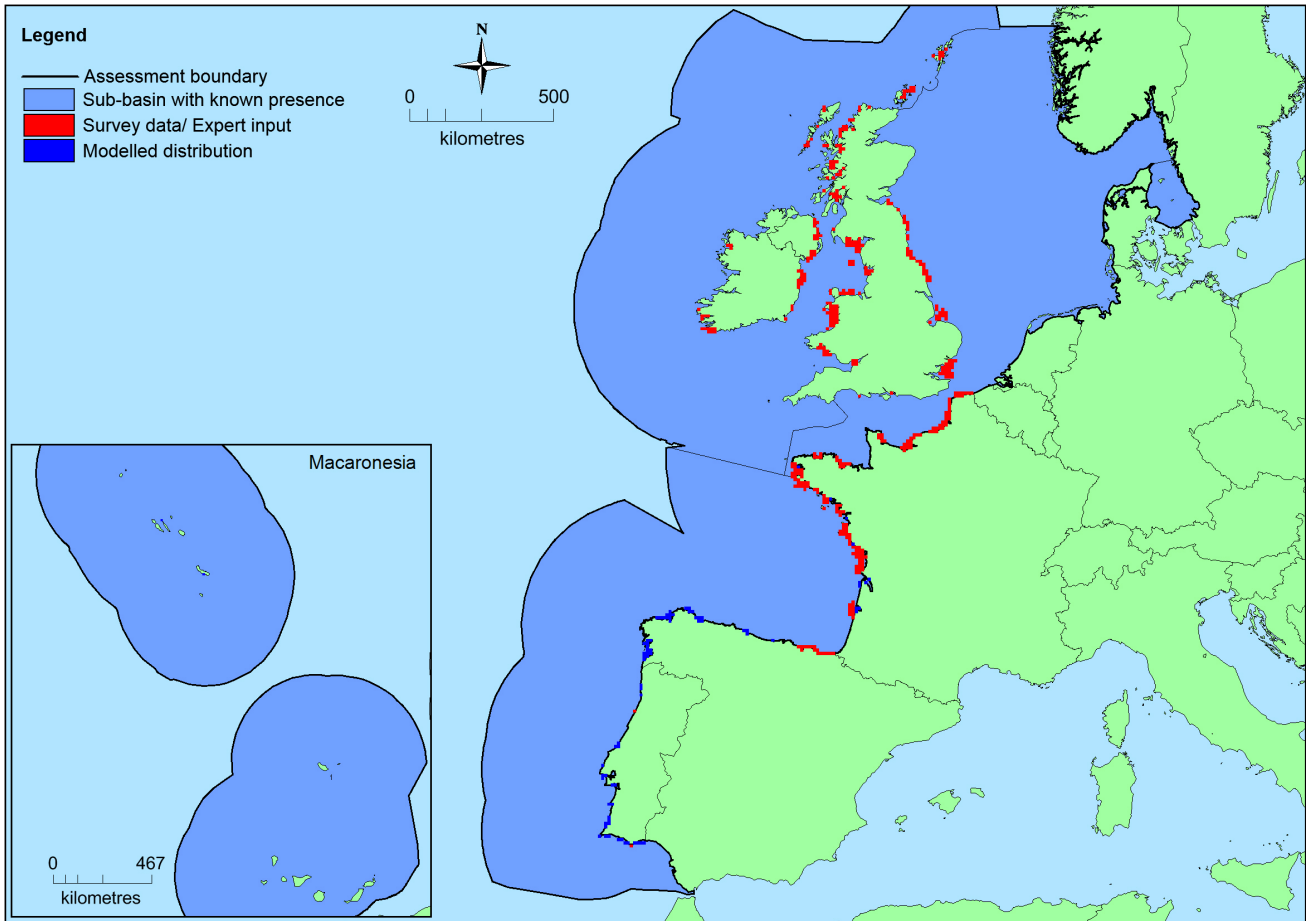This habitat is widespread and common in the North East Atlantic region.

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)
North-East Atlantic	Bay of Biscay and the Iberian Coast: Present Celtic Seas: Present Greater North Sea: Present Macaronesia: Present Kattegat: 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
EU 28	3,456,649 Km^2	599	>661 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
EU 28+	>3,456,649 Km^2	>599	>661 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 likely to have been some natural variation in the physical extent of infralittoral muddy sand habitat in the North East Atlantic. Some small localised losses have been reported (e.g. in sheltered locations) but overall the changes in extent are unknown.

- Average current trend in quantity (extent)
  EU 28: Stable
  EU 28+: Stable
- 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 (EOO >50,000km^2).
- 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 (EOO >50,000km^2).

Trends in quality

Most sedimentary benthic systems on the continental shelf of Europe have been modified by fishing activities, particularly bottom trawls and dredging, in the last 100 yr. Decline is therefore apparent over historical time periods and in more recent time even in sheltered inlets (used as fishing areas during bad weather conditions). These pressures continue therefore the current trend is considered to be a decline in quality.

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

Pressures and threats

Abrasion, physical disturbance and substratum loss of this habitat occur because of fishing activities, particularly through the use of beam trawls, and scallop dredging. It had been shown that these activities affect large infaunal and epifaunal species, and cause a decrease in sessile polychaetes.

Discharges of waste water and solid waste from aquaculture may increase the organic content and can result in significant change in the community of sedimentary habitats.

The fauna associated with this habitat have a high intolerance to synthetic compounds and hydrocarbon contamination and there is likely to be a major decline in species richness in this habitat where this pressure occurs. Moreover changes in the water flow rate resulting from construction and coastal modification will change the sediment structure and have subsequent effects on the biological community.

List of pressures and threats

Urbanisation, residential and commercial development

Discharges
    Disposal of household / Recreational facility waste
    Disposal of industrial waste
    Water discharges (with/without contaminants)

Biological resource use other than agriculture & forestry

Marine and Freshwater Aquaculture
    Intensive fish farming, intensification
    Suspension culture
    Bottom culture
Fishing and harvesting aquatic resources
    Professional active fishing
    Benthic or demersal trawling
    Benthic dredging

Pollution

Marine water pollution
    Oil spills in the sea

Conservation and management

Beneficial management measures for this habitat include the regulation of fishing activity which damage or disturb seabed communities, including through the estabishment of marine protected areas. Additionally, appropriate regulation and control of aquaculture effluent and chemical discharges, as well

as development control and contingency plans to be followed in the event of a major pollution incident.

List of conservation and management needs

Measures related to marine habitats

Other marine-related measures

Measures related to spatial planning

Other spatial measures

Measures related to hunting, taking and fishing and species management

Regulation/Management of fishery in marine and brackish systems

Measures related to urban areas, industry, energy and transport

Other measures
Urban and industrial waste management

Conservation status

Annex 1:

1110: MATL U2, MMAC U1

1160: MATL U2 , MMAC FV

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

Meta-analysis of data on fishing impacts on muddy sand communities indicate that the recovery of biota can be measured in years.

Effort required

10 years	20 years
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 therefore 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. The precise extent is unknown however as EOO >50,000 km^2 and AOO >50, this exceeds the thresholds for a threatened category on the

basis of restricted geographic distribution. There has been a decline in the biotic quality of this habitat and the major threat (demersal fisheries) is likely to cause continuing declines in quality within the next 20 years, however, 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 criterion B 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	>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, particularly bottom trawls and dredging, in the last 100 years. Declines in quality are therefore likely and expert opinion is that this may be fairly substantial. This habitat has therefore been assessed as Near Threatened under criteria C/D 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
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	NT	DD	DD	DD	DD	DD	DD
EU28+	DD	DD	DD	DD	LC	LC	LC	DD	DD	DD	NT	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

Overall Category & Criteria			
Near Threatened	C/D1	Near Threatened	C/D1

Confidence in the assessment
Medium (evenly split between quantitative data/literature and uncertain data sources and assured expert knowledge)

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