A2.23 Polychaete/amphipod-dominated Atlantic littoral fine sand

Summary

This intertidal habitat is associated with shores of clean, medium to fine and very fine sand, with no coarse sand, gravel or mud present, supporting a range of species including amphipods and polychaetes. Fine sand communities may be present throughout the intertidal zone on moderately exposed beaches, or they may be present on the lower parts of the shore adjacent to upper shore mobile sand communities.

This habitat is subject to pressures and threats that extend across all intertidal sedimentary habitat types, with both natural- (storm, tidal) and anthropogenically-mediated change (groyne/sea wall construction urbanisation etc.) constituting the greatest modifying influence. Documented threats include: substratum loss; changes in emergence, water flow and wave action; changes in nutrient levels and eutrophication; synthetic chemical, heavy metal and hydrocarbon contamination and harvesting of infaunal species. In addition, in the German Wadden Sea, this habitat is subject to shallow bottom trawling for shrimp and mussel. In the longer term, this habitat is vulnerable to sea level change.

Beneficial management measures include the regulation coastal developments and hard coastal defence structures, water quality improvement programmes to reduce the risk of toxic contamination and nutrient enrichment, and control, including restrictions, on intertidal fisheries which affect the associated communities.

Synthesis

This habitat is relatively common where littoral sand flats are able to form and consequently has a considerable natural range throughout the North East Atlantic region. Littoral sediment features are generally dynamic, and change in extent is difficult to quantify due to the natural processes, such as current/drift, wave action and wind, but historical losses are known to have occurred. The communities associated with this habitat are also naturally extremely variable often reflecting the shifting seasonal nature of the shore sediment, which is predominantly influenced by weather and tidal events. While there have been known losses as a result of human pressures, the scale of these losses are unknown when considered within a regional context.

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 given the lack of information on its 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

Code and name

A2.23 Polychaete/amphipod-dominated Atlantic littoral fine sand

Intertidal shore where the predominant substrate is medium and fine sand. Kentra Bay, Scotland (© G.Saunders).

Intertidal shore where the predominant substrate is fine sand. Some *Arenicola marina* casts are visible on the surface. Kentra Bay, Scotland (© G.Saunders).

Habitat description

This intertidal habitat is associated with shores of clean, medium to fine and very fine sand, with no coarse sand, gravel or mud present. Shells and stones may occasionally be present on the surface. The sand may be duned or rippled as a result of wave action or tidal currents. The degree of drying between tides is limited, and the sediment usually remains damp throughout the tidal cycle. Typically, no anoxic layer is present. Fine sand communities may be present throughout the intertidal zone on moderately exposed beaches, or they may be present on the lower parts of the shore with mobile sand communities present along the upper shore. They support a range of species including amphipods and polychaetes. A strandline of talitrid amphipods typically develops at the top of the shore where decaying seaweed accumulates.

Littoral sediment features are generally dynamic, and their extent will vary on diurnal, lunar and seasonal cycles, driven by tidal regime, prevailing weather conditions, coastal and geomorphological processes. The associated habitats can therefore exhibit considerable natural variation. Fine sand shores may show seasonal changes, with sediment accretion during calm summer periods and beach erosion during more stormy winter months. There may be a change in sediment particle size structure, with finer sediment grains washed out during winter months, leaving behind coarser sediments.

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:

On the lower shore, and where sediments are stable, bivalves such as *Angulus tenuis* may be present in large numbers. *Arenicola marina* casts may be present on the sediment surface. An exceptionally rich fine sand community has been recorded from very sheltered reduced salinity shores in Poole Harbour, UK. Species recorded include *Anaitides maculata*, *Hediste diversicolor*, *Scoloplos armiger*, *Pygospio elegans*, *Tharyx killariensis*, oligochaetes, *Gammarus locusta*, *Hydrobia ulvae*, *Cerastoderma edule* and *Mya truncata*.

Classification

EUNIS (v1405):

Level 4 of the EUNIS classification . A sub-habitat of ‘Atlantic littoral sand’ (A2.2)

Annex 1:

1140 Mudflats & sandflats not covered at low tide

1160 Large shallow inlets and bays

MAES:

Marine - Marine inlets and transitional waters

Marine - Coastal

MSFD:

Littoral Sediment

EUSeaMap:

Not mapped

IUCN:

12.2 Sandy Shorelines and/or Beaches, Sand Bars, Spits etc.

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

Unknown

Justification

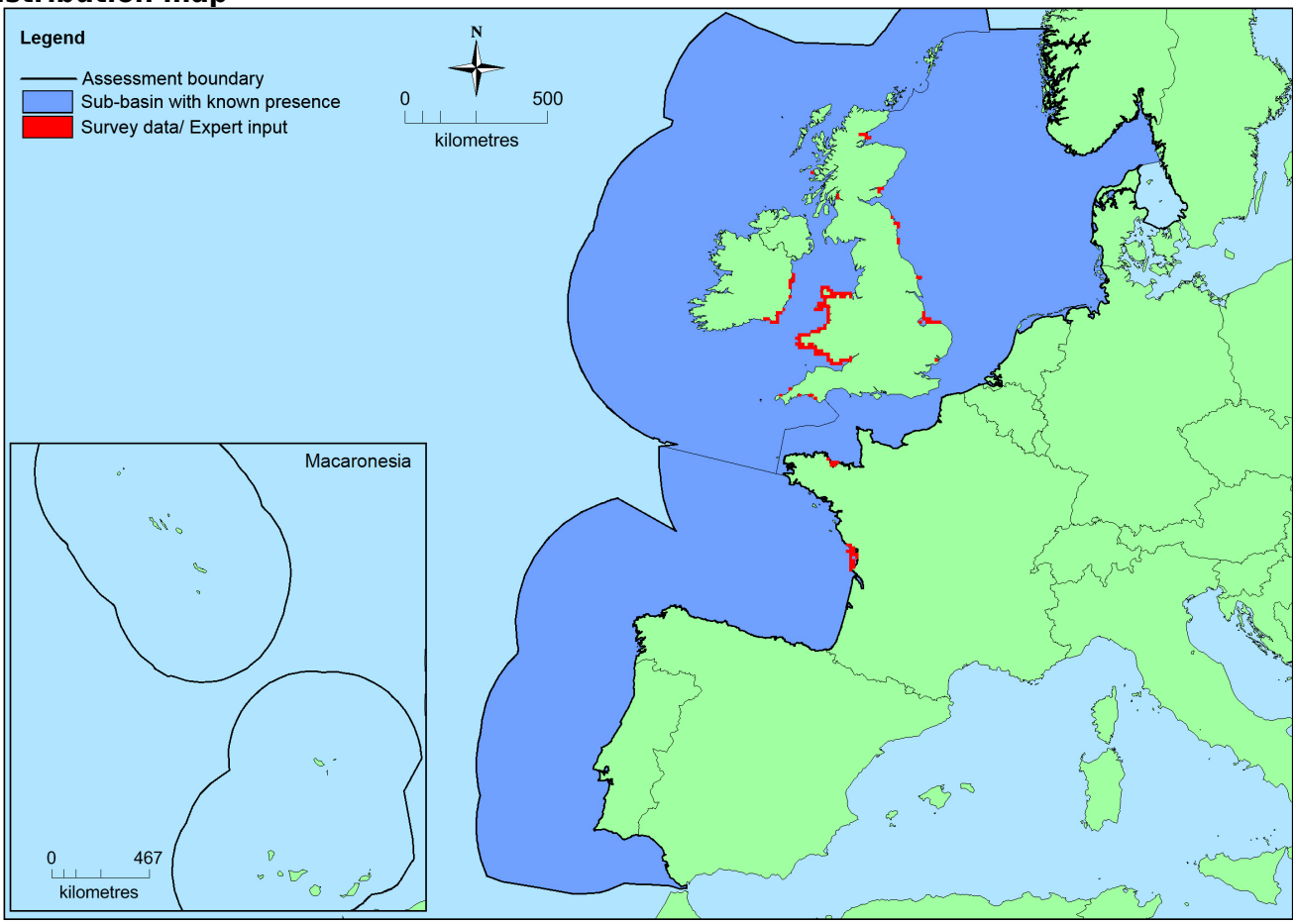
Geographic occurrence and trends

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: Uncertain Macaronesia: Uncertain	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	455,215 Km^2	182	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+	>455,215 Km^2	>182	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, 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

Local and/or seasonal factors often exert a substantial influence on intertidal habitats making it difficult to distinguish any long-term trend across the region. This is further complicated by differences between

localities, which are often linked to differences in geographical latitude and, therefore, to variation in climatic traits like temperature and/or ice cover. There have however been some substantial reductions in the extent of this habitat recorded in some parts of the North East Atlantic. In Germany, for example, most changes took place before 1700, especially within estuaries, where coastal defence developments (embankment, dyking, dredging) have been carried out up to 1950, with further deepening of shipping channels proposed in the near future.

- 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. For example it occurs in the Waddensea in the eastern part of the region as far south as estuaries on the French, Portuguese and Spanish Atlantic coasts.
- 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. For example it occurs in the Waddensea in the eastern part of the region as far south as estuaries on the French, Portuguese and Spanish Atlantic coasts.

Trends in quality

Local and/or seasonal factors often exert a substantial influence on intertidal habitats making it difficult to distinguish any long-term trend across the region. There is often considerable seasonal variability in biota, with the infaunal community subject to periodic redistribution by the erosion and accretion of the sediment. This is further complicated by differences between localities, which are often linked to differences in geographical latitude and, therefore, to variation in climatic traits like temperature and/or ice cover. There have, however, been some substantial reductions in the quality of this habitat recorded in some parts of the North East Atlantic. In Germany, for example a 10-30% decline has occurred since 1750 and a 30-70% decline before 1700. Shrimp and mussel fisheries are affecting substantial areas of intertidal sedimentary habitat, with additional changes being incurred through hydrological modification and climate change.

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

Pressures and threats

In broad terms, this habitat is subject to pressures and threats that extend across all intertidal sedimentary habitat types, with both natural- (storm, tidal) and anthropogenically-mediated change (groyne/sea wall construction urbanisation etc.) constituting the greatest modifying influence.

Documented threats to sandflats include: substratum loss; changes in emergence, water flow and wave action; changes in nutrient levels and eutrophication; synthetic chemical, heavy metal and hydrocarbon contamination and harvesting of infaunal species. In addition, in the German Wadden Sea, this habitat is subject to shallow bottom trawling for shrimp and mussel.

In the longer term, this habitat is vulnerable to sea level change.

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
Benthic or demersal trawling

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

Climate change

Changes in abiotic conditions
Changes in biotic conditions

Conservation and management

Beneficial management measures include the regulation coastal developments and hard coastal defence structures, water quality improvement programmes to reduce the risk of toxic contamination and nutrient enrichment, and control including restrictions on intertidal fisheries which affect the associated communities.

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 urban areas, industry, energy and transport

Urban and industrial waste management

Measures related to special resouce use

Regulating/Managing exploitation of natural resources on sea

Conservation status

Annex 1:

1140: MATL U2, MMAC XX

1160: MATL U2, MMAC FV

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

Field study evidence suggests that intertidal sand communities have a strong capacity for natural recovery

following chemical or physical disturbance via rapid recolonisation through bedload transport of juveniles and adults. This is particularly quick for polychaete-dominated assemblages, with community structure becoming re-established within a matter of months following the removal of the pressure.

As a consequence of this, the biological communities are highly resilient and are able to replenish and restore themselves after a major disturbance event over very short periods of time.

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 %

Littoral sediment features are generally dynamic with the associated habitats exhibiting considerable natural variation. Continental coasts (e.g. Germany) have, however, historically undergone losses of this habitat due to coastal defence measures being carried out up to around 1950. Continuing threats occur from the deepening of shipping channels and other hydrographic modifications, together with nutrient/chemical contamination and bottom trawling.

While there are known historical reductions in extent of this habitat in specific North East Atlantic localities, there is insufficient information for entire region. This habitat has therefore been 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^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) 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)

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