A2.33 Communities of Mediterranean mediolittoral mud

Summary

Muddy shores are present but not common in the four sub-basins of the Mediterranean. They are typically found in association with coastal lagoons,and river mouths. The most extensive examples are found around the deltas of the Ebro (Spain) Rhone (France) and Po (Italy) while smaller, very localised pockets are present across the region.

Littoral mud typically forms extensive mudflats, though dry compacted mud can form steep and even vertical structures, particularly at the top of the shore adjacent to saltmarshes. This habitat is present in sheltered inlets and embayments which are not part of major estuarine systems or in areas that were previously rocky or cobble fields, but where pseudofaeces from filter feeding gastropods have accumulated. This can lead to the presence of a thick layer of mud.

Being directly subject to various human activities, this habitat is especially prone to impacts such as coastal pollution, coastal zone development, contamination of sediments and altered flow regimes. Direct engagement of stakeholders in the planning of the management process, analysis of social and economic costs and benefits of different management options will be essential to the successful implementation of conservation actions. Other measures include better management of waste from industry and urbanisation, improving water quality and establishing marine protected areas and other spatial planning measures.

Synthesis

Approximately two-thirds of the Mediterranean coastline is currently urbanized and in the most industrial regions this increases to 75%. This urbanization has especially impacted deltas, estuaries and coastal lagoons, therefore it is reasonable to presume that these habitats have suffered declines in quantity and quality. It has not been possible to quantify this decline therefore this assessment is based on expert opinion.

This habitat has been assessed as Vulnerable for both the EU 28 and EU 28+ because of an estimated substantial reduction in quality. This is based on an intermediate decline affecting more than 50% of the habitat.

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

Sub-habitat types that may require further examination

None.

Habitat Type

Code and name

A2.33 Communities of Mediterranean mediolittoral mud

No characteristic photographs currently available for this habitat.

Habitat description

This habitat is present in sheltered inlets and embayments which are not part of major estuarine systems. It may also form in areas that were previously rocky or cobble fields, but where pseudofaeces have accumulated from filter-feeding gastropods, leading to the presence of a thick layer of mud. Such a build up of pseudofaeces results in a bed that is very soft to walk on, and sediment which is anoxic to the surface.

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:

This habitat is characterised by species such as: Polychaetes: *Hediste diversicolor, Nephtys hombergii*, *Goniada emerita*, *Laonice bahusiensis*, *Notomastus latericeus;* bivalves: *Cerastoderma glaucum, Abra alba; g*astropods: *Hydrobia* spp; *and* crustaceans such as: *Monocorophium insidiosum, Gammarus* spp.

Classification

EUNIS (v1405):

Level 4. . A sub-habitat of Littoral mud (A2.3).

Annex 1:

1140 Mudflats & sandflats not covered at low tide

MAES:

Marine - Marine inlets and transtional waters

Marine - Coastal

MSFD:

Littoral sediment

EUSeaMap:

Not mapped.

IUCN:

9.10 Estuaries

12.4 Mud shoreline and intertidal mud flat

Barcelona Convention (RAC/SPA)

II.1.1 Facies of muddy sands and muds

Does the habitat type present an outstanding example of typical characteristics of one or more biogeographic regions?
No

Justification
Although there are areas of mediolittoral muddy sand in the Mediterranean, this habitat is not considered one of the more common habitats of the mediolittoral zone.

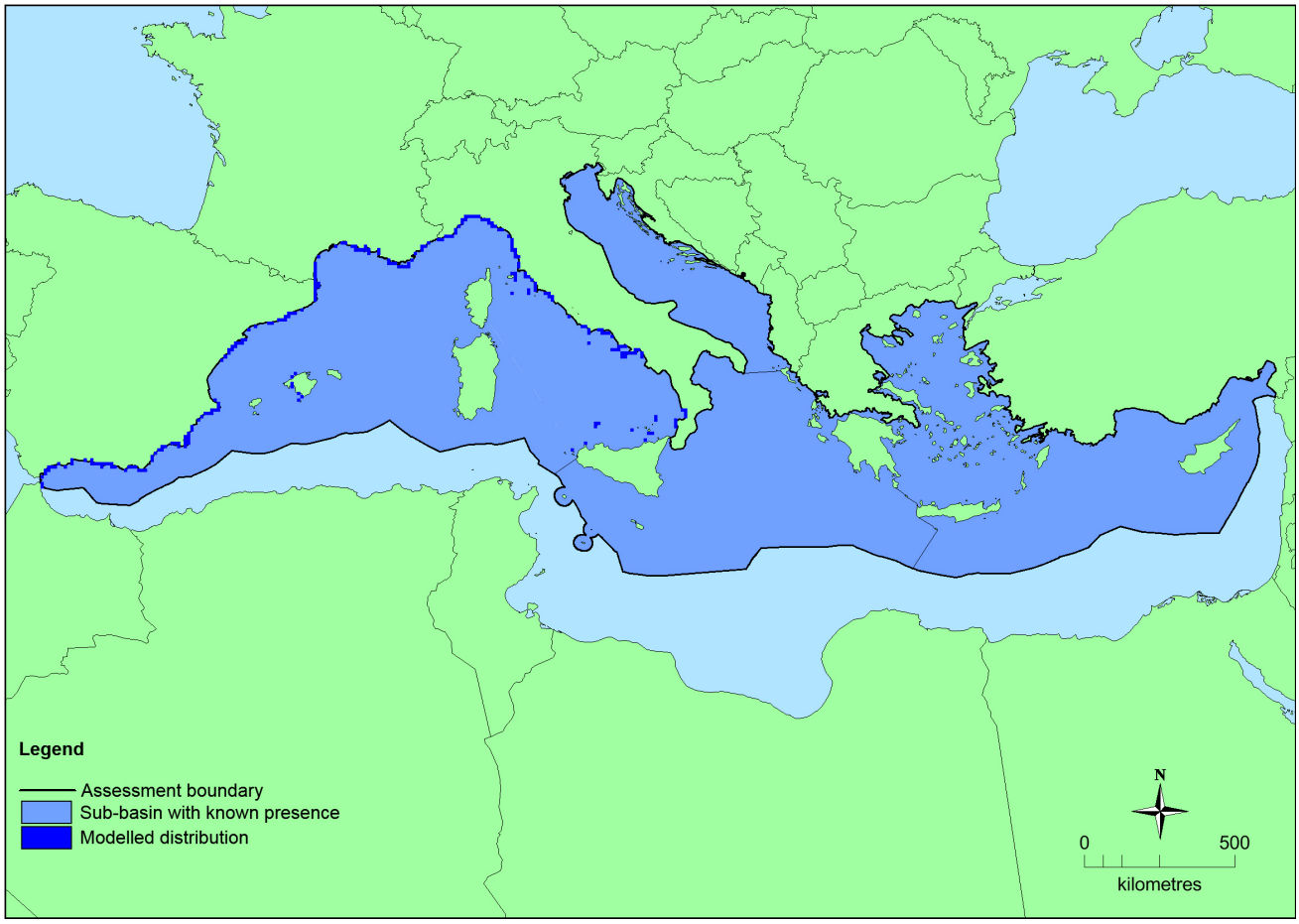
Geographic occurrence and trends

Region	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
Mediterranean Sea	Adriatic Sea: Present Aegian-Levantine Sea: Present Ionian Sea and the Central Mediterranean Sea: Present Western Mediterranean Sea: Present	Unknown Km^2	Decreasing	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	914,346 Km^2	242	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+	>914,346 Km^2	>242	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 western Mediterranean (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?

Unknown.

Trends in quantity

Muddy shores are present but not common in the four sub-basins of the Mediterranean. They are typically found in association with coastal lagoons, and river mouths with the more extensive example including around the deltas of the Ebro (Spain) Rhone (France) and Po (Italy) and smaller, very localised occurrances pockets present in across the region.

Approximately two-thirds of the Mediterranean coastline is currently urbanized, and in the most industrial regions this increases to 75%. More than 1,500km of coastline is artificial of which 1,250km is developed for harbours and ports. In some regions, the growth of cities, tourism and industry mean that up to 90% of the coastline has been developed. A survey carried out in Italy by the World Wildlife Fund in 1996 revealed that 42.6% of the entire Italian coast was subject to intensive human occupation and only 29% was undeveloped.

The urbanization of the coast is predicted to increase further in the near future by between 10-20% for most Mediterranean countries.

Considering all the previous facts, it is assumed here that at least 30% of all littoral habitats in the Mediterranean have disappeared. If littoral habitats are evenly distributed across the coast, around 30% of

this habitat type could have been lost over the last 50 years, however it is not possible to quanitfy the scale of loss for this particular habitat. Trends are likely to remain the same in the future.

- Average current trend in quantity (extent)
  EU 28: Decreasing
  EU 28+: Decreasing
- Does the habitat type have a small natural range following regression?
  No
  Justification
  This habitat does not have a small natural range as the EOO is larger than 50,000 km^2
- 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 as the EOO is larger than 50,000 km^2

Trends in quality

Every analysis performed in any littoral zone across the Mediterranean showed that human activities had significant negative impacts on all littoral habitats types, and that the pressures do not act in isolation but they often combine at multiple scales. Thus, expert opinion is that the quality of this habitat declined in the Mediterranean. They include changes in the species composition and abundance linked to the effects of nutrient enrichment, altered flow regimes following coast protection works and coastal zone developments.

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

Pressures and threats

As every area in a littoral zone of the Mediterranean Sea, this habitat is being affected by a combination of human activities. These include coastal pollution and nutrient enrichment (from urban, agricultural, industrial), contaminated sediments, coastal zone development and altered flow regimes as a result of coast protection works or modification of river flows.

List of pressures and threats

Urbanisation, residential and commercial development

Urbanised areas, human habitation
Industrial or commercial areas
Discharges

Pollution

Pollution to surface waters (limnic, terrestrial, marine & brackish)
Marine water pollution
Soil pollution and solid waste (excluding discharges)

Natural System modifications

Human induced changes in hydraulic conditions

Conservation and management

There are various legal provisions and policies which relate to this habitat such as the ICZM Protocol of

from Barcelona Convention. Beneficial measures include improving water quality and both direct and indirect effects of coastal development. Direct engagement of stakeholder in the planning of the management process, analysis of social and economic costs and benefits of different management options will be essential to the successful implementation of conservation actions. Other measures include better management of waste from industry and urbanisation, improving water quality and establishing marine protected areas and other spatial planning measures.

List of conservation and management needs

Measures related to wetland, freshwater and coastal habitats

Restoring/Improving water quality
Restoring coastal areas

Measures related to marine habitats

Restoring marine habitats

Measures related to spatial planning

Establish protected areas/sites
Legal protection of habitats and species
Manage landscape features

Measures related to urban areas, industry, energy and transport

Urban and industrial waste management
Specific management of traffic and energy transport systems
Managing marine traffic

Conservation status

Annex 1:

1140: MMED U2

Littoral mud is an Endangered habitat type listed in Annex 1 of the Bern Convention.

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

The capacity for this habitat to recover once severely damaged is unknown.

Effort required

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 %

Due to the high degree of coastal development which has severly impacted the littoral zone in the Mediterranean, expert opinion is that there has been a decline in quantity of this habitat over the last 50 years, and that this trend is likely to continue. However, as there is a lack of information on the extent of this habitat, and no specific data to quantify the decline, it has 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	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 Mediterranean. 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. Expert opinion is that there are continuing declines in both quantity and quality of this habitat. The patchy, localised 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.

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	>50 %	Intermediate %	Unknown %	Unknown %	Unknown %	Unknown %
EU 28+	>50 %	Intermediate %	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%

General data for quality indicators in littoral area of the Mediterranean show a substantial reduction and expert opinion is that there has been an intermediate decline in over 50% of the Mediterranean. Therefore, this habitat has been assessed as Vulnerable 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

No quantitative analysis has been carried out to assess the risk of ecosystem collapse for this habitat. It is therefore assessed as Data Deficient under criterion E.

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	VU	DD	DD	DD	DD	DD	DD	DD	DD	DD
EU28+	DD	DD	DD	DD	LC	LC	LC	VU	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
Vulnerable	C/D1	Vulnerable	C/D1

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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Date of review
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