A2.42 Communities of Mediterranean mediolittoral mixed sediment

Summary

Shores of mixed sediments range from muds with gravel and sand components to mixed sediments with pebbles, gravels, sands and mud in more even proportions. By definition, mixed sediments are poorly sorted and there is no easily defined boundary between areas of mixed sediment with stable cobbles and boulders, and boulder fields which fall into the rocky shore category. Stable large cobbles or boulders may be present which support epibiota such as fucoids and green seaweeds which are more commonly found on rocky and boulder shores. Mixed sediments which are predominantly muddy tend to support infaunal communities which are similar to those of mud and sandy mud shores.

This habitat is especially prone to impacts from coastal pollution, coastal zone development, contamination of sediments and biota, and episodic perturbations such as associated with aggregate removal or beach cleaning. There are various legal provisions and policies which relate to this habitat such as the ICZM Protocol of the Barcelona Convention but nothing specific. Beneficial measures include improving water quality and regulating both direct and indirect effects of coastal development. The engagement of stakeholders in the planning of the management process, and the analysis of social and economic costs and benefits of different management options will be essential to the successful implementation of conservation actions.

Synthesis

Approximately two-thirds of the Mediterranean coastline is currently urbanized, and in the most industrial regions this increases to 75%. This pressure is predicted to continue and although it has resulted in declines in quantity and quality of this habitat, the decline cannot be quantified.

This habitat is widespread throughout the Mediterranean Sea, with a large EOO and AOO, and therefore it qualifies as Least Concern under Criterion B, however because of lack of information on trends it has been assessed as Data Deficient for both the EU 28 and EU 28+.

<table>
<thead>
<tr>
<th>Overall Category &amp; Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU 28</td>
</tr>
<tr>
<td>Red List Category</td>
</tr>
<tr>
<td>Data Deficient</td>
</tr>
<tr>
<td>Data Deficient</td>
</tr>
</tbody>
</table>

Sub-habitat types that may require further examination

None.

Habitat Type

Code and name

A2.42 Communities of Mediterranean mediolittoral mixed sediment

No characteristic photographs of this habitat currently available.

Habitat description

Shores of mixed sediments range from muds with gravel and sand components to mixed sediments with pebbles, gravels, sands and mud in more even proportions. By definition, mixed sediments are poorly sorted. It is likely that there are broad transition areas between areas of mudflat or sandy mudflat, and mixed sediment biotopes where the sediment consists mainly of mud but has significant proportions of
gravel and sand mixed in. Gravel mud may occur in patches on mudflats. Similarly, there is no easily defined boundary between areas of mixed sediment with stable cobbles and boulders, and boulder fields which fall into the rocky shore category. Stable large cobbles or boulders may be present which support epibita such as fucoids and green seaweeds which are more commonly found on rocky and boulder shores.

Mixed sediments which are predominantly muddy tend to support infaunal communities which are similar to those of mud and sandy mud shores. Habitats with sheltered gravel sandy mud, which are subject to reduced salinity, mainly on the mid and lower shore, may have abundant communities of polychaetes.

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: *Aphelochaeta marioni*, *Capitella capitata*, *Cirriformia tentaculata*, *Sphaerosyllis taylori*, *Pygospio elegans*; bivalves: *Cerastoderma edule*, *Abra nitida*; oligochaetes: *Tubificoides pseudogaster*; crustaceans: *Aora gracilis*, *Melita palmata*, *Microprotopus maculatus*, *Corophium volutator*.

**Classification**

EUNIS (v1405):

Level 4. A sub-habitat of littoral mixed sediment (A2.4)

Annex 1:

1160 Large shallow inlets and bays

MAES:

Marine - Marine inlets and transitional waters
Marine - Coastal

MSFD:

Shallow sublittoral coarse sediment
Shallow sublittoral mixed sediment

EUSeaMap:

Not mapped,
IUCN:
12.3 Shingle and/or pebble shoreline and/or beaches

Barcelona Convention (RAC/SAC)
II.3.1. Biocenosis of mediolittoral coarse detritic bottoms.

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

**Justification**

**Geographic occurrence and trends**

<table>
<thead>
<tr>
<th>Region</th>
<th>Present or Presence Uncertain</th>
<th>Current area of habitat</th>
<th>Recent trend in quantity (last 50 yrs)</th>
<th>Recent trend in quality (last 50 yrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mediterranean Sea</td>
<td>Adriatic Sea: Present Aegian-Levantine Sea: Present Ionian Sea and the Central Mediterranean Sea: Present Western Mediterranean Sea: Present</td>
<td>Unknown Km²</td>
<td>Decreasing</td>
<td>Decreasing</td>
</tr>
</tbody>
</table>

**Extent of Occurrence, Area of Occupancy and habitat area**

<table>
<thead>
<tr>
<th>Region</th>
<th>Extent of Occurrence (EOO)</th>
<th>Area of Occupancy (AOO)</th>
<th>Current estimated Total Area</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EU 28</strong></td>
<td>928,625 Km²</td>
<td>710</td>
<td>Unknown Km²</td>
<td>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.</td>
</tr>
<tr>
<td><strong>EU 28+</strong></td>
<td>&gt;928,625 Km²</td>
<td>&gt;710</td>
<td>Unknown Km²</td>
<td>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.</td>
</tr>
</tbody>
</table>

**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 although this habitat does occur in the EU 28+.

**Trends in quantity**

Approximately two-thirds of the Mediterranean coastline is currently urbanized, in the most industrial regions this increases to 75%. This urbanization has especially impacted soft sediment shores hence it is reasonable to presume that this habitat has suffered a decline in quantity over the last 50 years.

The majority of the Mediterranean coast is dominated by concrete: 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 continue with increases of between 10-20% considered likely for most Mediterranean countries over the next 50 years.

The overall current trend is therefore considered to be decreasing.

- **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 of this habitat exceeds 50,000 km².

- 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 of this habitat exceeds 50,000 km².

**Trends in quality**

Human activities have had significant negative impacts on all littoral habitats in the Mediterranean with threats acting in isolation as well as combine at multiple scales, leading to changes in the abundance and diversity of species associated with habitats such as this. Thus, the quality of this habitat is believed to have declined although the extent to which this has occurred is difficult to quantify.

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

**Pressures and threats**

Littoral habitats in the Mediterranean are subject to a variety of pressures and threats. The main ones are coastal pollution and nutrient enrichment (from urban, agricultural, industrial activities), coastal zone development, and contamination of sediments and biota caused by anti-foulants and atmospheric inputs of hazardous compounds and dredging and dumping of wastes. Coastal development can also alter the flow regime. Mixed sediment habitats can be expected to be subject to these same pressures

**List of pressures and threats**

**Agriculture**
- Use of biocides, hormones and chemicals
- Fertilisation

**Urbanisation, residential and commercial development**
- Urbanised areas, human habitation
- Industrial or commercial areas
- Discharges

**Pollution**
- Pollution to surface waters (limnic, terrestrial, marine & brackish)
  - Nutrient enrichment (N, P, organic matter)
- Marine water pollution
- Soil pollution and solid waste (excluding discharges)

**Conservation and management**

There are various legal provisions and policies which relate to this habitat such as the ICZM Protocol of the 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.
List of conservation and management needs

Measures related to wetland, freshwater and coastal habitats
- Restoring/Improving water quality

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

Measures related to special resource use
- Regulating/Management exploitation of natural resources on land
- Regulating/Managing exploitation of natural resources on sea

Conservation status

Annex 1:
1160: MMED XX

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

Effort required

Red List Assessment

Criterion A: Reduction in quantity

<table>
<thead>
<tr>
<th>Criterion A</th>
<th>A1</th>
<th>A2a</th>
<th>A2b</th>
<th>A3</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU 28</td>
<td>Unknown %</td>
<td>Unknown %</td>
<td>Unknown %</td>
<td>Unknown %</td>
</tr>
<tr>
<td>EU 28+</td>
<td>Unknown %</td>
<td>Unknown %</td>
<td>Unknown %</td>
<td>Unknown %</td>
</tr>
</tbody>
</table>

The habitat has probably suffered large declines in surface area over the last 50 years but the scale of the decline cannot be quantified. This habitat has therefore been assessed as Data Deficient under criteria A for both the EU 28 and EU 28+.

Criterion B: Restricted geographic distribution

<table>
<thead>
<tr>
<th>Criterion B</th>
<th>B1</th>
<th>B2</th>
<th>B3</th>
</tr>
</thead>
<tbody>
<tr>
<td>EOO</td>
<td>a</td>
<td>b</td>
<td>c</td>
</tr>
<tr>
<td>AOO</td>
<td>a</td>
<td>b</td>
<td>c</td>
</tr>
<tr>
<td>EU 28</td>
<td>&gt;50,000 Km^2</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>EU 28+</td>
<td>&gt;50,000 Km^2</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

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**

<table>
<thead>
<tr>
<th>Criteria C/D</th>
<th>C/D1</th>
<th>C/D2</th>
<th>C/D3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Extent affected</td>
<td>Relative severity</td>
<td>Extent affected</td>
</tr>
<tr>
<td><strong>EU 28</strong></td>
<td>Unknown %</td>
<td>Unknown %</td>
<td>Unknown %</td>
</tr>
<tr>
<td><strong>EU 28+</strong></td>
<td>Unknown %</td>
<td>Unknown %</td>
<td>Unknown %</td>
</tr>
</tbody>
</table>

There is a lack of information to determine any trends in quality of this habitat although indications of decline have been reported from some areas. This habitat has therefore been assessed as Data Deficient under criteria C/D.

**Criterion E: Quantitative analysis to evaluate risk of habitat collapse**

<table>
<thead>
<tr>
<th>Criterion E</th>
<th>Probability of collapse</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EU 28</strong></td>
<td>Unknown</td>
</tr>
<tr>
<td><strong>EU 28+</strong></td>
<td>Unknown</td>
</tr>
</tbody>
</table>

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+**

<table>
<thead>
<tr>
<th>A1</th>
<th>A2a</th>
<th>A2b</th>
<th>A3</th>
<th>B1</th>
<th>B2</th>
<th>B3</th>
<th>C/D1</th>
<th>C/D2</th>
<th>C/D3</th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>E</th>
</tr>
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<tbody>
<tr>
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<td>DD</td>
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<td>LC</td>
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</table>

**Overall Category & Criteria**

<table>
<thead>
<tr>
<th>EU 28</th>
<th>EU 28+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red List Category</td>
<td>Red List Criteria</td>
</tr>
<tr>
<td>Data Deficient</td>
<td>-</td>
</tr>
<tr>
<td>Red List Category</td>
<td>Red List Criteria</td>
</tr>
<tr>
<td>Data Deficient</td>
<td>-</td>
</tr>
</tbody>
</table>

**Confidence in the assessment**

Low (mainly based on uncertain or indirect information, inferred and suspected data values, and/or limited expert knowledge)
Assessors
A. Soldo.

Contributors
S. Gubbay & N. Sanders.

Reviewers
M. García Criado and M.del Mar, Oterio.

Date of assessment
07/01/2016

Date of review
01/04/2016

References


UNEP. 2006. Classification of benthic marine Habitat types for the Mediterranean Region. UNEP (OCA)/MED WG 149/5 Rev. 1.


