A5.38x: Communities of Mediterranean circalittoral muddy detritic bottoms

Summary

This habitat is present in areas where a detritus bottom is covered with mud formed by terrigenous deposits from rivers. A singular community is developed by facies with *Ophiotrix quinquemaculata* where the brittle stars can be found in fairly abundant densities. Because of the low sedimentation rates, small hard substrates such as shells remain on the surface and allow the development of sessile epifauna.

The main pressures on this habitat are demersal trawling and eutrophication, which enhance oxygen depletion and alteration of sedimentation rates, as it has been observed in the Adriatic Sea. The slow recovery time of the assemblages can result in changes in the associated communities, shifting to favour an abundance of small invertebrates, such as anemones.

Strengthening fishing restrictions, designating Marine Protected Areas (MPAs) where this habitat occurs and increasing the knowledge and monitoring of its distribution and ecology will assist to conserve and evaluate appropiate conservation measures for the future.

Synthesis

This is a very poorly studied habitat type and only few reports exists regarding its distribution at few locations. Moreover, data on quality or quantity is lacking, although a slight to moderate decrease on quality is considered likely due to current pressures.

The habitat has a large Extent of Occurrence (EOO) and Area of Occupancy (AOO), and therefore it qualifies as Least Concern under Criterion B. However, the habitat is assessed as Data Deficient both at the EU 28 and the EU 28+ levels because of a lack of information on any trends in quantity and quality.

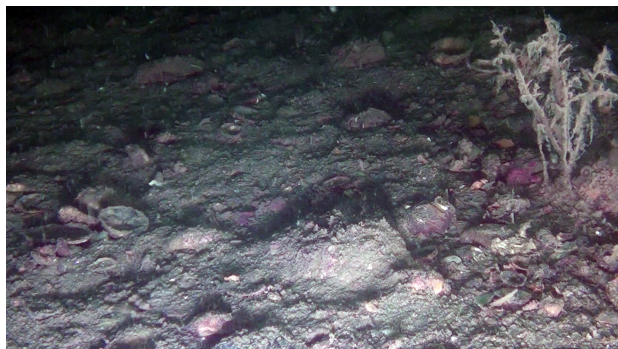| Overall Category & Criteria			
EU 28		EU 28+	
Red List Category	Red List Criteria	Red List Category	Red List Criteria
Data Deficient	-	Data Deficient	-

Sub-habitat types that may require further examination

None.

Habitat Type

Code and name

A5.38x: Communities of Mediterranean circalittoral muddy detritic bottoms

Communities of Mediterranean circalittoral muddy detritic bottoms from the

*Pseudothyone raphanus f*rom the north Adriatic Sea at 18 meters depth (© S.

Habitat description

This habitat develops in areas where a detritus bottom is covered with mud formed by terrigenous deposits from rivers. The sediment is a very muddy sand or sandy mud, or even a rather compacted mud, rich in shell debris or volcanic fragments (scoriae). Sedimentation deposits slow enough to allow the development of sessile epifauna. Gravel, sand and mud are mixed in varying quantities, but mud always predominates.

This biocenosis hosts the facies of the brittlestar *Ophiothrix quinquemaculata.* This species in some places forms an extremely dense population which is formed almost by 90% ophiurans.

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:

Porifera: *Raspailia viminalis.*

Cnidaria: *Alcyonum palmatum, Anemodactis mazeli.*

Holothuridae: *Psedothyone raphanus.*

Mollusca: Pelecypoda *Tellina serrata,* the gastropod *Turritella communis* and the bivalves *Abra prismatica, Corbula gibba, Myrtea spinifera, Nucula nitidosa* and *Thyasira flexuosa.*

Sipunculida: *Golfingia elongata.*

Polychaeta: *Aphrodite aculeata, Polyodontes maxillosus, Eupanthalis kinbergi, Leiocapitella dollfussi, Clymene palermitana.*

Isopoda: *Cirolana neglecta.*

Classification

EUNIS:

Level 4 of the EUNIS classification (v1405). A sub-habitat of 'Mediterranean circalittoral mud' (A5.3).

Annex 1:

1160 Large shallow inlets and bays.

MAES:

Marine - Marine inlets and transitional waters

Marine - Coastal

MSFD:

Shallow sublittoral mud, mixed

EUSeaMap:

Shallow muds

IUCN:

9.5 Subtidal sandy-mud

9.6 Subtidal muddy

Other relationships:

Barcelona code:

IV. 2. 1. Facies con *Ophiothrix quinquemaculata*

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

Justification
Facies of adult brittle stars *Ophiothrix quinquemaculata* seem to be exclusively found on the muddy detritic biocenosis in the Mediterranean. A more complete description of the habitat will allow to ascertain if it represents an outstanding example from the 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)
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	>50,000 Km^2	>50	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.

	Extent of Occurrence (EOO)	Area of Occupancy (AOO)	Current estimated Total Area	Comment
EU 28+	>50,000 Km^2	>50	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
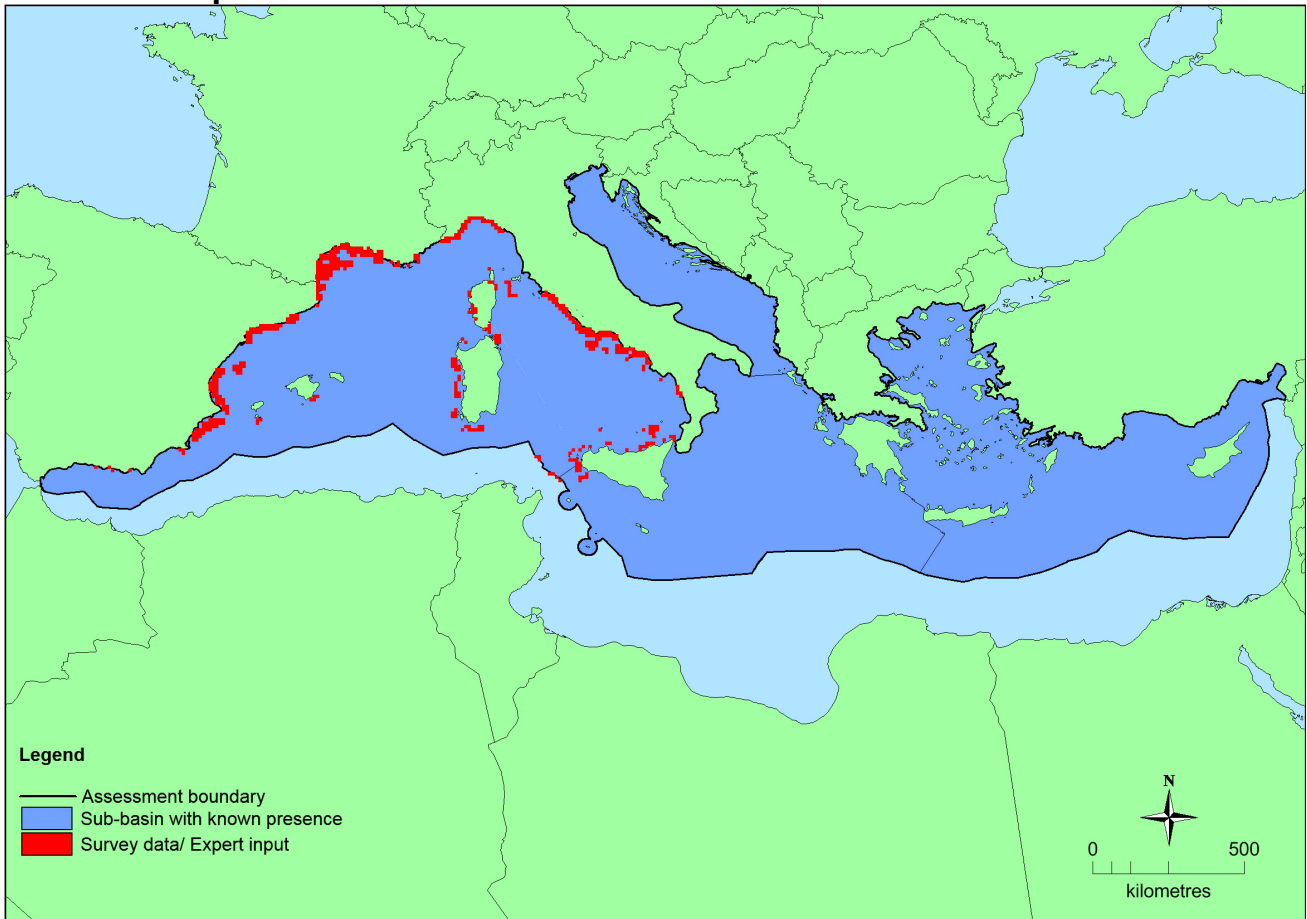
Source: IUCN based on EMODNet database 2015. Distribution information is available only from western Mediterranean, although the habitat is known to be widespread throughout the whole Mediterranean basin.

How much of the current distribution of the habitat type lies within the EU 28?

The habitat is widely present in the Mediterranean Sea. According to the information provided by EMODnet Seabed Habitats, this habitat is represented in both EU and non-EU countries of the Mediterranean. Facies with *Ophiothrix quinquemaculata* have been described in the north Adriatic Sea (Trieste and Istria coast), Banyuls- sur-mer (France), the Gulf of Lions, the Archipelago of Cabrera and the Channel of Menorca (Spain), among others. However, it is now possible to provide an estimate of the current distribution of the habitat type within the EU 28.

Trends in quantity

Few reports have described any trends of this habitat in the Mediterranean Sea. Decrease has been reported most notably in the north Adriatic Sea (Gulf of Trieste), with large mortalities of the fauna associated to this habitat due to anoxia in 1974, 1983 and 1988. These events destroyed over 50% of the epifaunal biomass of muddy and muddy detritic bottoms in only two days, and over 90% within four days

in some cases. A significant reduction of the communities (particularly of the brittle star *Ophiothrix* and the sponge *Reniera*) has been later observed as a consequence of oxygen depletion, marine snow events and benthic fisheries. Whether these impacts occur in other areas of the Mediterranean is unknown.

- Average current trend in quantity (extent)
  EU 28: Decreasing
  EU 28+: Unknown
- Does the habitat type have a small natural range following regression?
  No
  Justification
  The habitat has an EOO larger than 50,000 km^2.
- Does the habitat have a small natural range by reason of its intrinsically restricted area?
  No
  Justification
  The habitat is widespread present along the Mediterranean coast.

Trends in quality

There are no concrete studies that evaluate the trends in quality over the last 50 years, and the information regarding trends given by territorial experts indicates a slight to moderate decline. In general, the available scientific information seems to indicate that it is considered as degrading in the north Adriatic for the last 50 years. Here, hypoxia (oxygen concentrations <2.0 ml l-1) and anoxia (no oxygen) have been indicated to increase in frequency and period, causing predation by anemones on the brittle star *Ophiothrix quinquemaculata* and changes on the composition of the dominant fauna. Therefore, the average trend in quality in the EU 28 and the EU 28+ is assumed to be decreasing.

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

Pressures and threats

This habitat is particularly sensitive to the physical disturbance caused by demersal fishing activities such as bottom trawling and dredging. Past benthic fisheries have severely altered the nature of the communities in this habitat. Moreover, in the northern Adriatic Sea, several anoxic events have been reported affecting a wide-ranging community and causing large mortalities. Marine snow events in which large cloud-like masses of mucus settled from the water column and covered the sediment surface and benthic organisms have also been reported in the area. This material settled to the bottom and became entangled in the arms of *Ophiothrix quinquemaculata* and other animals. The extent of the mortalities caused by thise phenomenon is unknown, but it is known to occur repeatedly at different Mediterranean areas.

List of pressures and threats

Biological resource use other than agriculture & forestry

Fishing and harvesting aquatic resources
Professional active fishing
Benthic or demersal trawling
Benthic dredging

Natural biotic and abiotic processes (without catastrophes)

Silting up
Accumulation of organic material

Eutrophication (natural)

Conservation and management

Recommended actions for conservation and management include: i) the designation of Marine Protected Areas (MPAs) in areas where this habitat occurs, particularly where facies of *Ophiothrix quinquemaculata* are present, ii) strengthening fishing restrictions, especially bottom trawling in the network of MPAs and decrease the sources of eutrophication to prevent further decrease of the condition of the habitat; and iii) enhance greater understanding on the distribution, ecology and dynamics of the communities of circalittoral muddy detritic bottoms to facilitate the identificaiton of conservation needs and suggest further management measures and protection 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

Measures related to hunting, taking and fishing and species management

Regulation/Management of fishery in marine and brackish systems

Measures related to special resouce use

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?

Information regarding the recovery capacity of this habitat is being reported only from the north Adriatic Sea due to anoxic events. Here, after the anoxic events, the recolonization process has been slow: the total biomass and the relative contribution of the main species have remained distinctly below previously recorded values. It is believed that additional anthropogenic influences (such as intensive dredging) may further halt recolonization.

Effort required

20 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 %

There is no information on past and future trends on this habitat type. This habitat has therefore 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 Km²	Yes	Unknown	No	>50	Yes	Unknown	No	No
EU 28+	>50,000 Km²	Unknown	Unknown	No	>50	Unknown	Unknown	No	No

This habitat is present in the eastern and western Mediterranean, and the EOO and AOO values exceed the thresholds for a threatened Category.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 even if a continuing decline in the spatial extent and the abiotic conditions has been reported for the 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	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 %	Slight-moderate %	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%

Despite the information available from the north Adriatic Sea that indicates a decline, there is insufficient data from other Mediterranean regions to ascertain the extent of reduction in the abiotic quality of the habitat, which has been estimated by territorial experts as slight to moderate. Therefore, the habitat type is assessed as Data Deficient under Criterion C/D, C and 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. Therefore, it is 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	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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