A2.25: Communities of Mediterranean mediolittoral sands

Summary

This habitat occupies the boundary between the poorly swashed, almost dry supralittoral sands and the permanently submerged infralittoral sands of Mediterranean beaches. Coarser sediments are often found in beaches exposed to stronger wave action whilst finer sediments are common on the more sheltered shores. Depending on the sediment characteristics the infauna is dominated by polychaetes, oligochaetes, bivalves, amphipods and bivalves

Accelerated erosion rates of this habitat is a widespread phenomenon along most of its basin mainly because of anthropogenic impact, e.g. the proliferation of marinas and other urban and tourist-industry infrastructure, sea level rise as a result of global warming, reduced river sediment inputs as a consequene of damming, river bed quarrying, land use changes, harbours and other coastal defence structures. These factors work at different scales in each coastal region. The acceleration of sea level rise and increase of stockastic climate driven events will enhance the loss of this habitat in the future.

In some Mediterranean countries, strict limits and distance from the coast for dredging of sands and gravel are in place. Some beaches are also protected as NATURA 2000 sites and MPAs because the Green Turtle (*Chelonia mydas*) and the Loggerhead Turtle (*Caretta caretta*) nest regularly on these beaches. Additional beneficial actions could including; preventing activities such as coast protection works that destablise the habitat or interfere with the natural dynamics; beach nourishment schemes using appropriate materials and developing management practices for the beach cleaning which avoid the use of heavy machinery.

Synthesis

Although the quantitative data on trends are lacking and territorial data are not provided for all countries, it is possible to conclude from the available information that this habitat has undergone declines in extent and quality in the recent past. Such declines are expected to continue in response to ongoing pressures and predicted future impacts of climate change. The decline in extent over the last 50 years is estimated to have exceeded 30% and a similar scale of decline in predicted in the future. Declines in quality have not been quantified. This habitat has therefore been assessed as Vulnerable for the EU 28 and EU 28+.

Overall Category & Criteria			
EU 28		EU 28+	
Red List Category	Red List Criteria	Red List Category	Red List Criteria
Vulnerable	A1, A2a, A2b	Vulnerable	A1, A2a, A2b

Sub-habitat types that may require further examination

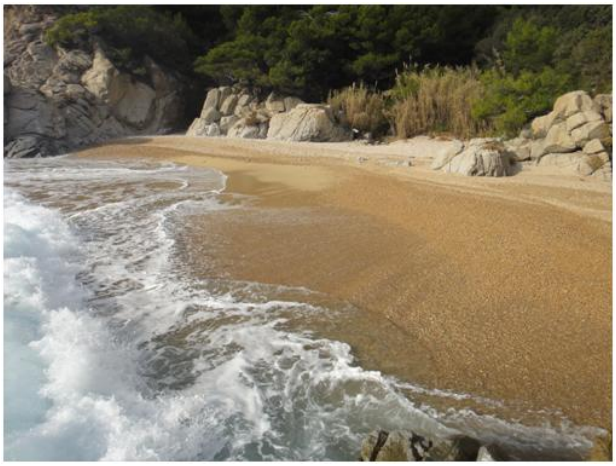
None.

Habitat Type

Code and name

A2.25: Communities of Mediterranean mediolittoral sands

Mediolittoral fine sands habitat, Spain (© Littoral Cartography Group, CEAB, CSIC).



Mediolittoral coarse sands and gravels along the Catalan coast, Spain (© Littoral Cartography Group, CEAB, CSIC).

Habitat description

This habitat occupies the boundary between the poorly swashed, almost dry supralittoral sands and the permanently submerged infralittoral sands of Mediterranean beaches. The sediment grains range from gravels to fine sands. Coarser sediments are often found in beaches exposed to stronger wave action whilst finer sediments are common on the more sheltered shores. Depending on the sediment characteristics the infauna is dominated by polychaetes, oligochaetes, bivalves, amphipods and bivalves. Characateristic species of associated biotopes incude the polychaetes *Pisione remota*, *Saccocirrus papillocercus*, *Scolelepis squamata* and *Ophelia bicornis,* the isopod *Eurydice affinis* and on the lower shore by the bivalves *Donax semistriatus* and *D. trunculus* and the crab *Portumnus latipes.* This habitat is used for nesting by loggerhead turtle, *Caretta caretta* and green turtle, *Chelonia mydas* in parts of the eastern Mediterranean.

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 overtime.

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. As most bivalves are sensitive to pollution, air exposure, and habitat destruction they could be potential indicators of quality for this habitat.

Characteristic species:

Polychaeta- *Pisione remota, Saccocirrus papillocercus, Hesionura serrata, Microphtalmus similis, Scolelepis squamata, Ophelia bicornis.*

Bivalvia- *Donax semistriatus, Donax trunculus, Donacilla cornea, Ensis minor, Dosinia lupinus, Kurtiella bidentata.*

Gastropoda- *Caecum trachea, Nassarius mutabilis.*

Amphipoda- *Ecchinogammarus foxi, Melita bulla, Stenothoe sp., Monocorphium sextonae.*

Isopoda- *Eurydice affinis, Sphaeroma serratum.*

Decapoda- *Portumnus latipes,*

Classification

EUNIS (v1405):

Level 4. A sub-habitat of 'Littoral sand and muddy sand' (A2.2).

Annex 1:

1160 Large shallow inlets and bays

MAES:

Marine - Inlets and transitional waters

Marine – Coastal

MSFD:

Littoral sediment

IUCN:

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

Barcelona Convention (RAC/SPA):

I. 2. 1. Biocenosis of supralittoral sands

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

Yes

Regions
Mediterranean

Justification
Mediolittoral sands are common and widespread throughout the Mediterranean.

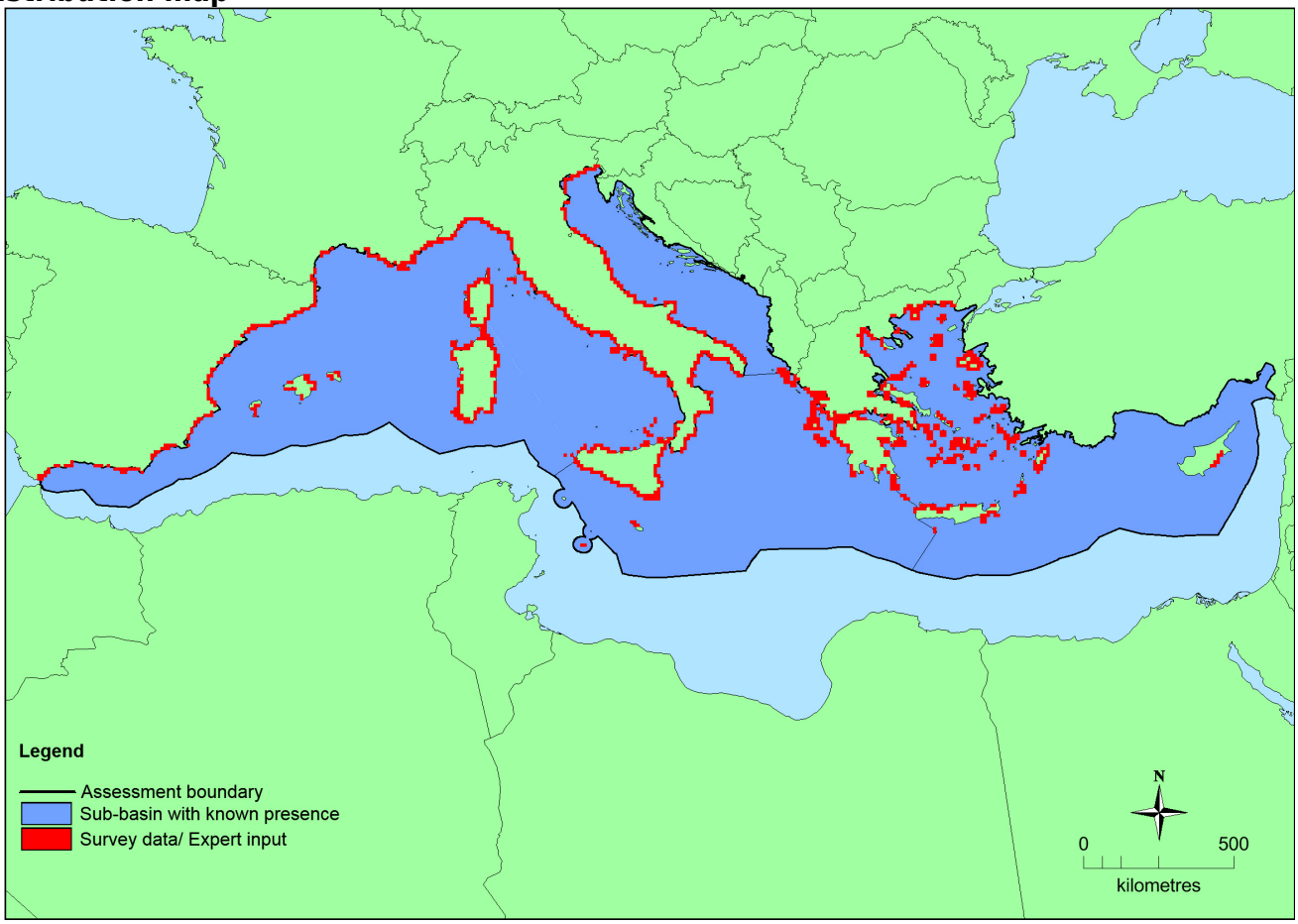
Geographic occurrence and trends

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	2,457,261 Km^2	1,410	8,509 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+	2,457,261 Km^2	1,410	8,509 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



This map has been generated using data from IUCN and the European Environment Agency (EEA), and supplemented with expert opinion. 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 may not indicate the full distribution of the habitat .

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

Overall more than 46% of the Mediterranean coast is estimated to be dominated by soft sediments. The percentage within the EU 28 is unknown.

Trends in quantity

There is limited information on the overall extent and trend in quanitity of this habitat but regional studies from many areas suggest it is decreasing and that the associated communities are either stable or

decreasing. Much of this trend has taken place over the last century and has been associated with human activity. One estimate is that around 1,500 km of the EU Mediterranean coast had been transformed to “artificial coast” (mostly in the Balearic Islands, Gulf of Lion, Sardinia, and the Adriatic, Ionian, and Aegean seas).

Figures are available for various time periods and areas. For example according to the Atlas of the Italian Beaches, 27 % of the Italian beaches are decreasing in extent, 70 % in equilibrium, only very few coastal stretches in progradation. Between 1965 and 1980, over 20 % of the 132 km-long French Riviera was permanently altered through the building of yachting harbours, reclaimation schemes and alteration of beaches. Along the Catalan coast of Spain, an estimated 72% of the beaches are consisdered to be retreating by an average of 1 metre a year. Similar estimates have been made for beaches in Greece that are not near large river deltas. Overall in 2004 an estimated 40% of beaches in France, Italy and Spain were considered to be eroding mostly due to human disturbance.

Given the current pressures, the general trend of beach erosion and loss of this habitat due to coastal development is considered likely to continue.

- 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 nor an intrinsically restricted area.

Trends in quality

There is a lack of information to determine any trends in quality of this habitat although indications of decline, apparent from reduced diversity of infauna, have been reported from some areas. Beach nourishment schemes, whilst aimed are reducing erosion of the habitat can also degrade habitat quality because of the use of inappropriate materials such as river bed gravels from alluvial plains, crushed stone, marine aggregates, and building materials.

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

Pressures and threats

This habitat is vulnerable to activities on a variety of scales. Coast protection schemes, illegal mining and development projects such as the construction of marinas as well as urban and tourist infrastructure can alter the hydrographic conditions, affect patterns of erosion and sediment size composition,and lead to changes in the infaunal communities. Trampling and disturbance on intensively used beaches can also have a detrimental effect on some species. In the Eastern Mediterranean, all these impacts are particularly known to affect sea turtle nesting by depriving them of their nesting grounds.The use of heavy machinery for cleaning the beaches and remove *Posidonia* beach-cast for the summer tourist season is also a common practice that affects the beach ecosystem.

Climate change could contribute significantly to beach erosion because of the predicted increase of storm activity and intensity, sea level rise and the interaction of both consequences.

List of pressures and threats

Urbanisation, residential and commercial development

Urbanised areas, human habitation

Human intrusions and disturbances

Intensive maintenance of public parcs / Cleaning of beaches

Natural System modifications

Estuarine and coastal dredging
Modification of hydrographic functioning, general
Alteration of sea-floor/ Water body morphology

Climate change

Sea-level changes

Conservation and management

In some Mediterranean countries, strict limits and distance from the coast for dredging of sands and gravel are in place. Some beaches are also protected as NATURA 2000 sites and through regulation in MPAs because the Green Turtle (*Chelonia mydas*) and the Loggerhead Turtle (*Caretta caretta*) use them as nesting beaches. Additional beneficial actions could including; preventing activities such as coast protection works that destablise the habitat or interfere with the natural dynamics; beach nourishment schemes using appropriate materials and developing management practices for the beach cleaning which avoid the use of heavy machinery.

List of conservation and management needs

Measures related to wetland, freshwater and coastal habitats

Restoring/Improving the hydrological regime
Restoring coastal areas

Measures related to spatial planning

Establish protected areas/sites
Legal protection of habitats and species

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?

Beach nourishment schemes may be used to restore the natural dynamics of beaches and enhance accretion so that beach sediment accumulates or is stabilised. The associated infaunal species are robust and able to colonise rapidly. Restoration of their use as turtle nesting beaches is likely to be on a longer time scale and dependent on other factors which affect the distribution and health of sea turtles.

Effort required

10 years	20 years
Through intervention	Through intervention

Red List Assessment

Criterion A: Reduction in quantity

Criterion A	A1	A2a	A2b	A3
EU 28	>30 %	>30 %	>30 %	unknown %
EU 28+	>30 %	>30 %	>30 %	unknown %

From the available information it is inferred on the basis of expert opinion and trends in Spain, France, Italy and Greece over the last 50 years, that there has been an overall decline of at least 30% in the extent of this habitat.

Given continuing coastal development pressures an estimated overall reduction of 30-40% is considered likely over any 50 year period including the recent past, present and near future. This habitat has therefore been assessed as Vulnerable under criterion A1,A2a and A2b, and Data Deficient under criteria A3 in 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	Unknown	Unknown	No	>50	Unknown	Unknown	No	No

This habitat has a large natural range in the Eastern and Western Mediterranean. It is considered likely to have a continuing decline in quantity, however as EOO >50,000km^2 and AOO >50, this exceeds the thresholds for a threatened category on the basis of restricted geographic distribution. 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 for the EU 28 under all criteria and for criteria B1c, B2c and B3 for the EU 28+. It is 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%

There is a lack of information to determine any trends in quality of this habitat although indications of decline, apparent from reduced diversity of infauna, 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

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	VU	VU	VU	DD	LC	LC	LC	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD
EU28+	VU	VU	VU	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
Vulnerable	A1, A2a, A2b	Vulnerable	A1, A2a, A2b

Confidence in the assessment

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

Assessors

Otero M. M.

Contributors

Mariani S., Ballesteros E., Elena Cefalì M.

Reviewers

Gubbay, S.

Date of assessment
05/11/2015

Date of review
18/12/2015

References

Alexandrakis, G., Karditsa, A., Poulos, S., Ghionis, G., Kampanis, A. 2010. *An assessment of the vulnerability to erosion of the coastal zone due to a potential rise of sea level: the case of the Hellenic Aegean coast*. In: Environmental Systems, [Ed. Achim Sydow], in Encyclopedia of Life Support Systems (EOLSS), Developed under the Auspices of the UNESCO, Eolss Publishers, Oxford ,UK, [http://www.eolss.net] [Retrieved October 24, 2010]

Aucelli P. et al. 2006. Lo stato dei litorali italiani. Gruppo Nazionale per la Ricerca sull'Ambiente Costiero. *Studi Costieri* 10: 5-112.

Ballesteros, E., S. Mariani, M. E. Cefalì, M. Terradas & E. Chappuis. 2014. *Manual dels hàbitats litorals a Catalunya. Generalitat de Catalunya*. Departament de Territori i Sostenibilitat, Barcelona. 251 pp.

Campbell ,et al. 2001. On status and conservation of marine turtles along the Egyptian Mediterranean Sea coast: results of the Darwin Initiative Sea Turtle Conservation Project 1998–2000. *Zoology in the Middle East* 24(1) 19-29.

Dexter, D. M. 1989. The sandy beach fauna of Egypt. *Estuarine, Coastal and Shelf Science*, 29: 261-271.

EC. 2004. *Development of a Guidance Document on Strategic Environmental Assessment (SEA) and Coastal Erosion Final Report DGENV European Commission,* (http://ec.europa.eu/ environment/iczm/pdf/coastal_erosion_fin_rep.pdf) Accessed 14 Aug 2014.

Fierro, G. & R. Ivaldi. 2001. The Atlas of the Italian Beaches: a review of coastal processes. In: ÖZHAN E. (Ed.), Proceedings of the 5th International Conference on the Mediterranean Coastal Environment (MEDCOAST 01), Middle East Technical University, Ankara, Turkey, vol. 3, 1557-1566 pp

Nicoletti, L., Paganelli, D., Gabellini, M. 2006. Environmental aspects of relict sand dredging for beach nourishment: proposal for a monitoring protocol. *Quaderno ICRAM n*. 5: 155 pp.

Özhan, E. 1993. Beach erosion and other management problems in the coastal zone of Tyre, Southern Lebanon, Unpublished report prepared for Intergovernmental Oceanographic Commission (IOC), UNESCO.

Pranzini, E. and Williams, A. T. 2013. Coastal Erosion and Protection in Europe Routledge/Earthscan, London, 454 pp.

Pranzini, E., Wetzel, L., William, A., 2015. Aspects of coastal erosion and protection in Europe. *J Coast Conserv*, 19: 445-459.

Pérès, J. M., & J. Picard. 1964. Nouveau manuel de bionomie benthique de la Mer Méditerranée. *Recueil des Travaux Statione Marine d'Endoume*, 31(47): 3-137.

San Vicente, C. & J. C. Sorbe. 1999. Spatio-temporal structure of the suprabenthic community from Creixell beach (western Mediterranean). *Acta Oecologica*, 20: 377-389.

Semprucci, F., Frontalini, F., Covazzi-Harriague, A. et al. 2013. Meio- and Macrofauna in the marine area of the Monte St. Bartolo Natural Park (Central Adriatic Sea, Italy). *Sci. Mar*. 77: 189-199.

Templado, J., E. Ballesteros, I. Galparsoro, A. Borja, A. Serrano, L. Marín & A. Brito. 2012. *Guía interpretativa: Inventario español de hábitats marinos*. *Inventario español de hábitats y especies marinos.*

Ministerio de Agricultura, Alimentación y Medio Ambiente. 229 pp.

UNEP/MAP: State of the Mediterranean Marine and Coastal Environment, UNEP/MAP – Barcelona Convention, Athens, 2012.