

A5.53 Seagrass and rhizomatous algal meadows in Pontic freshwater-influenced sheltered infralittoral muddy sands and sandy muds

Summary

The habitat is present throughout the Black Sea in sheltered, shallow (0.5-2 m) coastal waters (embayments, inlets, bights, harbours, estuaries), more or less influenced by freshwater (salinity 0.5-10 psu), with meadows formed by various seagrass. It is not present in the Sea of Marmara due to high levels of pollution. Pressures affecting the habitat include coastal development, eutrophication and hydrological regime change. At specific localities coastal development has caused the habitat to collapse. Eutrophication and hydrological regime change have been responsible for altering species compositions and biomass. This habitat is protected within the EU 28 as both a Special Area of Conservation and a Specially Protected Area. There is little protection outside of the EU 28.

Synthesis

There has been a slight decline in extent in the last 50 years in the EU 28, based on expert opinion. Therefore the habitat is assessed as Least Concern under Criterion A1.

In the EU 28+ the habitat type is assessed as Near Threatened under Criterion A1 as there has been a decline in extent of 25-30% in the last 50 years. This based on a combination of quantitative and qualitative data and expert opinion. Data is from sites in Crimea and Ukraine only and has been extrapolated for the rest of the Black Sea.

Overall Category & Criteria			
EU 28		EU 28+	
Red List Category	Red List Criteria	Red List Category	Red List Criteria
Least Concern	-	Near Threatened	A1

Sub-habitat types that may require further examination

None

Habitat Type

Code and name

A5.53 Seagrass and rhizomatous algal meadows in Pontic freshwater-influenced sheltered infralittoral muddy sands and sandy muds



Mixed meadow in freshwater-influenced Perla bay, Bulgaria. (© Dragos Micu)

Habitat description

This habitat occurs in sheltered shallow (0.5-2 m) coastal waters (embayments, inlets, bights, harbours, estuaries), more or less influenced by freshwater (salinity 0.5-10 psu), where sedimentary stability leads to mudding of the sand. Mixed or monospecific meadows are formed by *Zostera noltei*, *Ruppia maritima*, *R. cirrhosa*, *Chara spp.*, *Stuckenia pectinata* (formerly known as *Potamogeton pectinatus*), *Najas minor* and *Ranunculus baudotii*. Algae commonly found include species of *Cladophora* and *Ulva* which are tolerant of very low salinities.

Indicators of quality:

Both biotic and abiotic indicators have been used to describe marine habitat quality. These include the presence of particular species, water quality parameters, levels of exposure to a particular exposure as well as more integrated indices which describe habitat function and structure, such as trophic index, or successful stages of development in habitats that have a natural cycle of change over time. There are no known commonly agreed indicators of quality for this habitat, although particular parameters may be set in certain situations, e.g. protected features with Natura 2000 sites, where reference values may have been determined and applied on a location-specific basis. Some potential indicators of quality for this specific habitat are the presence of species (i.e. *Zanichellia* and *Ruppia*); species density; species composition; the ratio of higher plants to seagrasses; and biomass. There is insufficient information to set indicator thresholds required for monitoring purposes.

Characteristic species:

Zostera noltii, *Ruppia maritima*, *R. cirrhosa*, *Potamogeton pectinatus*, *Chara sp.*

Classification

This habitat may be equivalent to, or broader than, or narrower than the habitats or ecosystems in the following typologies.

EUNIS (v1405):

Level 4. A5.5 Pontic shallow/infralittoral coarse sediment.

Annex 1:

1110 Sandbanks slightly covered all the time

1130 Estuaries

1160 Large shallow inlets and bays

MAES:

Marine - Marine inlets and transitional waters

Marine - Coastal

MSFD:

Shallow sublittoral sand

Shallow sublittoral mud

EUSeaMap:

Shallow sands

Shallow muds

IUCN:

9.9 Seagrass (submerged)

9.10 Estuaries

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

No

Justification

The species composition of this habitat is widespread throughout European regional seas.

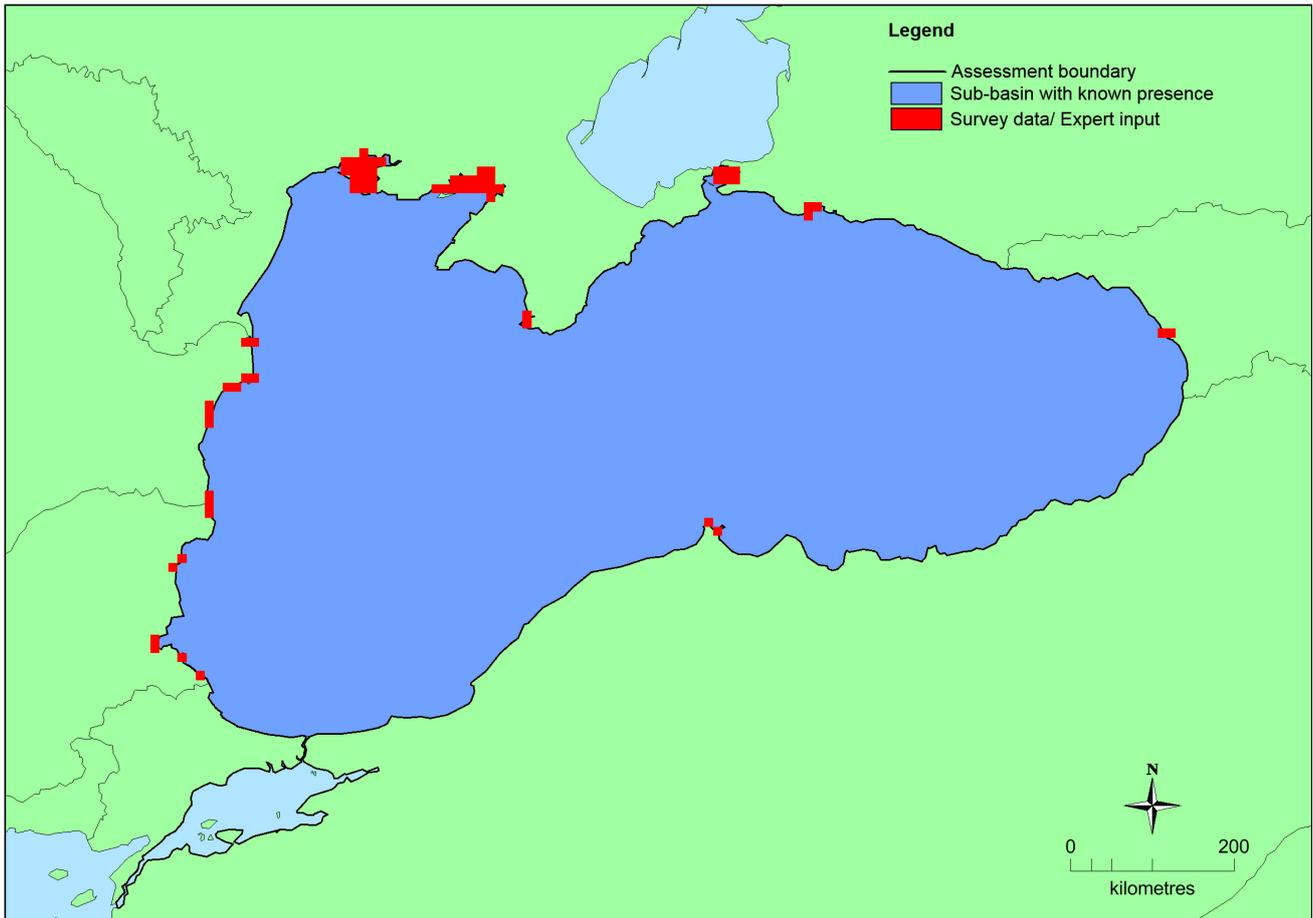
Geographic occurrence and trends

Region	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
<i>Black Sea</i>	Black 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
<i>EU 28</i>	21,555 Km ²	18	Unknown Km ²	Current total area of the habitat is unknown. Localities are known but not studied in detail. Total area estimates cannot be calculated.
<i>EU 28+</i>	382,000 Km ²	65	Unknown Km ²	Current total area of the habitat is unknown. Localities are known but not studied in detail. Total area estimates cannot be calculated.

Distribution map



This map has been generated based on expert opinion. The map has been used to calculate AOO and EOO. The map should be treated with caution as it does not necessarily reflect the full distribution of the habitat.

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

Around 28% of this habitat is estimated to be hosted by Eu 28 in the Black Sea.

Trends in quantity

In the historic period (pre 1965) the habitat quantity is likely to have been stable. It was first described in 1914 but no quantitative distribution records are available from this period. However, expert opinion states that is likely to have been generally stable. This is based on knowledge of the habitat and its likely response to pressures during this period. However it is known to have completely disappeared from one site between 1927 and 1968 (Novorossiysk Bay).

In the current period (1965 to present day) the habitat is believed to have reduced in extent. There has been a low level of widespread reduction. However, at some localities the habitat has collapsed. This is due to local coastal developments. For instance, at Kamyshovaya Bay (Crimea) the habitat collapsed between 1967 and 1999 due to port construction and associated dredging activities. The low level widespread reduction is mostly based on expert opinion. It is supported by data from individual sites where small reductions have occurred. Generally speaking expert opinion states that the construction of ports in Ukraine and Crimea during the last 50 years has not significantly reduced the extent of the habitat. Losses are also known to have occurred in front of the Danube Delta due to coastal management. These are not thought to be significant. No data is available for Turkey. It is possible that localities in Turkey remain unrecorded.

In the future the habitat extent is expected to remain stable. In EU countries most remaining localities are within protected areas.

- Average current trend in quantity (extent)

EU 28: Decreasing

EU 28+: Decreasing

- Does the habitat type have a small natural range following regression?

Yes

Justification

The habitat has a small range following regression in the EU countries only. In the EU 28+ the EOO exceeds 50,000 km². The habitat has not undergone an important decline in the last 50 years.

- Does the habitat have a small natural range by reason of its intrinsically restricted area?

Yes

Justification

The habitat can only form in mixed fresh and saline waters.

Trends in quality

In the historic period (pre 1965) the habitat quality is believed to have been high and stable. This is based on expert knowledge of the habitat and the likely response to known pressures during this period.

In the current period (1965 to present day) the quality has declined. From the 1970s onwards port construction and coastal developments in estuaries caused degradation through destruction, fragmentation and siltation. Water extraction from rivers has resulted in a change in species composition. For instance, the biomass of *Zostera* sp. increased at Sary-Bulat Lagoon and Lebyagii Islands (Crimea) as a result of this. Furthermore, filamentous algae invaded the habitat during the eutrophication period. This resulted in further changes to species composition.

In the future the habitat quality is uncertain. Extraction of river water and river basin management is also likely to affect the future quality of the habitat.

- Average current trend in quality

EU 28: Decreasing

EU 28+: Decreasing

Pressures and threats

Eutrophication as a result of nutrient enrichment (N, P and organic matter) is the most significant historic pressure on the habitat. Reduced light penetration due to eutrophication caused declines in extent and quality of the habitat. Since the 1990s this pressure has reduced due to tighter controls on pollution in the catchment of the Danube and other rivers, which enter the north-west Black Sea. Whilst this pressure is now reduced it is still a continuing threat in the current and future periods. This is especially true for non EU countries surrounding the Black Sea which are not bound by the agreements such as the Water Framework Directive (WFD).

Hydrological changes are a threat of future importance. This is caused by changes to fresh water inputs from rivers. Water extraction and river basin management are the pressures likely to result in this threat.

Siltation is a current and future threat to the habitat. The resettling of suspended sediment can cause smothering. This inhibits the growth of habitat forming species. Siltation is typically caused by dredging, trawling and other activities, which disturbed bottom sediments.

Sand extraction is a threat of current and future importance. This can lead to habitat destruction. Sand is an important building resource in the Black Sea. Sand extraction is likely to increase alongside development pressures in the region.

List of pressures and threats

Pollution

Pollution to surface waters (limnic, terrestrial, marine & brackish)
Nutrient enrichment (N, P, organic matter)

Natural System modifications

Human induced changes in hydraulic conditions
Removal of sediments (mud...)
Extraction of sea-floor and subsoil minerals (e.g. sand, gravel, rock, oil, gas)
Modification of hydrographic functioning, general
Siltation rate changes, dumping, depositing of dredged deposits

Conservation and management

The habitat is a characteristic feature of several habitat types listed in Annex 1 of the Habitats Directive like 1130 Estuaries. As a result it is included in Special Areas of Conservation (SACs). These areas are also included within Specially Protected Areas (SPAs) under the Birds Directive.

In EU states water quality and management are managed by the Water Framework Directive (WFD). Future management should include the designation of additional protected areas in non EU member states and improvement of water quality management and extraction regulations outside EU member states

List of conservation and management needs

Measures related to wetland, freshwater and coastal habitats

Restoring/Improving water quality
Restoring/Improving the hydrological regime
Managing water abstraction

Measures related to spatial planning

Establish protected areas/sites
Legal protection of habitats and species

Conservation status

Annex 1:

1130: MBLS U1

1160: MBLS U1

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

The habitat can recover naturally if the water quality is improved and the hydrological regime is stable. Recovery through intervention is not appropriate for this habitat type.

Effort required

10 years
Naturally

Red List Assessment

Criterion A: Reduction in quantity

Criterion A	A1	A2a	A2b	A3
EU 28	<30 %	unknown %	unknown %	unknown %
EU 28+	25-30 %	unknown %	unknown %	unknown %

In EU states the reduction of extent has been <30% in the last 50 years. This is based on expert opinion. In The EU 28+ the reduction of extent has been between 25-30% in the last 50 years. This is based on a combination of quantitative data (for specific sites), qualitative data and expert opinion. This habitat has therefore been assessed as Least Concern in the EU 28 and Near Threatened in the EU 28+.

Criterion B: Restricted geographic distribution

Criterion B	B1				B2				B3
	EOO	a	b	c	AOO	a	b	c	
EU 28	21,555 Km ²	No	No	No	18	No	No	No	No
EU 28+	>50,000 Km ²	No	No	No	>50	No	No	No	No

The AOO and EOO are intrinsically small for the EU states. Declines in in spatial extent, abiotic and biotic quality have halted. Climate change is a threatening processes which may cause declines in the next 20 years but the impacts are not well understood. The habitat exists at various locations, and there are no plausible human activities or stochastic events that may drive the habitat to be CR or Collapsed within a very short time period. Currently the habitat is not expeted to decline further in the future. Therefore the threshold values for threatened categories are not met for the EU 28 or EU28+.

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 insufficient data in declines in quality to apply criteria C/D. Locality specific data is available for sites in Crimea and Ukraine. However, due to specific locations associated with pressures and threats causing decline it cannot be extrapolated to the rest of the Black Sea.

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	LC	DD	DD	DD	LC	LC	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD
EU28+	NT	DD	DD	DD	LC	LC	DD	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
Least Concern	-	Near Threatened	A1

Confidence in the assessment

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

Assessors

S. Beal, D. Micu, V. Mihneva, N. Milchakova, B. Yokes

Contributors

D. Micu, S. Beal, V. V. Alexandrov, D. Korolesova, V. Mihneva, N. Milchakova, B. Yokes

Reviewers

K. Fürhaupter

Date of assessment

15/07/2015

Date of review

27/04/2016

References

Alexandrov, V.V. 2000. Assessment of the *Zostera marina* L. coenopoulations state near Sevastopol. *Ekologiya Morya* 52: 26-30.

Anon. 1999. *Biodiversity of the Dunaisky Biosphere Reserve, protection and management*. 704pp.

Anon. 2006. *The northwestern part of the Black Sea: biology and ecology*. 701pp.

Kalugina-Gutnik, A.A. 1982. Change in bottom vegetation of the Sevastopol Bay for the period of 1967-1977. *Ekologiya Morya* 9: 48-62.

Kulikova, N.M. and Kolesnikova, E.A. 1976. Associations of flowering plants in the Sevastopol Bay. *Biologiya Morya* 36: 17-25.

Micu, D., Zaharia, T., Todorova, V. and Niță, V. 2007. *Romanian Marine Habitats of European*

Interest. Punct Ochit Publishers, Constanța. 32pp. ISBN 978-973-88566-1-5.

Micu, D. 2008. Open Sea and Tidal Areas. *Natura 2000 Habitat Interpretation Manual for Romania*. Gafta, D. and Mountford, J.O. (Eds.). EU publication no. EuropeAid/121260/D/SV/RO. 101pp. ISBN 978-973-751-697-8.

Micu, D., Zaharia, T. and Todorova, V. 2008. Natura 2000 habitat types from the Romanian Black Sea. *The development of an indicative ecologically coherent network of marine protected areas in Romania*. Zaharia, T., Micu, D., Todorova, V., Maximov, V. and Niță, V. (Eds.). Romart Design Publishing, Constanta. pp 32.

Milchakova, N.A. 1996. Zannichellia major Boenn. communities in the Kertch Strait of the Black Sea. *Rastitelnye Resursy* 26(3): 417-427.

Milchakova, N.A. 1999. On the status of seagrass communities in the Black Sea. *Aquatic Botany* 65: 21-32.

Milchakova, N.A. and Phillips, R.C. 2003. Black sea seagrasses. *Marine Pollution Bulletin* 46: 695-699.

Moncheva, S. and Todorova, V. (Eds.). 2013. Initial assessment of the marine environment. In article 8 of msfd 2008/56/ec and noosmv (2010). 500pp.

Ovechko, S.V. 2012. Higher Aquatic Vegetation Dnieper-Bugsky estuary. *Materials of the All-Ukrainian scientific-practical conference "Estuaries of the Northwestern Black Sea: actual hydroecological problems and ways of their solutions: 144-147*.

Pogrebnyak, I.I. 1965. Bottom vegetation of estuaries of northwestern Black Sea and adjacent waters of the Sea: 31.

Sadogursky, S.E. 2001. To the study of macrophytobenthos of the Karkinitzky gulf protected waters (Black Sea). *Algologiya* 11(3): 342-359.

Sadogursky, S.E. 2009. Flora and vegetation of the waters of the branch of the Crimean Natural Reserve "Lebyagii Island" (Black Sea): current status and way of conservation. *Nature Reserves in Ukraine* 15(2): 41-50.

Todorova, V. and Panayotova, M. 2011. Sublittoral sands. *Red book of Republic of Bulgaria*. Vol. III. *Natural habitats*. Bas and Moew (Eds.). ISBN 978-9549746-23-5.

Zernov, S.A. 1913. On the question of the study of life of the Black Sea. *Zapiski Imperatorskoy Akademii Nauk*. 8 seriya. Po fiziko-matematicheskomu otdeleniyu (*Proceedings of the Emperor Academy of Sciences*. 8th series. *Physical and mathematical branch*) 32: 299.