A5.5z Seagrass meadows in Pontic moderately exposed upper infralittoral clean sands

Summary

The habitat is present throughout the Black Sea on areas of upper infralittoral sands at depths between 0.2 to 3m. This habitat is dominated by *Zostera noltei*. Historically the most significant pressure has been eutrophication. This has caused the greatest reductions in quantity and quality. This was most acutely experienced in the north-west Black Sea where there are high riverine inputs. Since the collapse of the Soviet Union transboundary pollution measures have been implemented and improved. This has led to a reduction in the pressure. Conservation measures which would benfit this habitat include pollution control and regulation, coastal development controls, survey and minitoring programmes, enhanced legal protection, and the designation of marine protected areas.

Synthesis

Detailed information on the abundance and extent of this habitat is lacking. Information on the quantity and quality of this habitat including historical or recent trends is unknown. For the purposes of Red List assessment this habitat is therefore considered to be Data Deficient.

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

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Zostera noltei meadow with epiphytes in Mangalia, Romania (© D.Micu)

Zostera noltei meadow around Karadag, Russia.(© N.Milchakova)

Habitat description

The habitat occurs in the upper infralittoral zone, on clean sands at depths between 0.2 to 3m. It is characterized by sedimentary stability and a low silt content of 5-10%. The dominant seagrass species is

Zostera noltei, which may form monospecific or mixed meadows (with *Zostera marina, Ruppia* spp. and *Zannichellia pedicellata).* Of areas surveyed in detail, the maximum biomass and density of this seagrass in the Black Sea has been measured in the Karkinitsky Bight, where it occurs on sandy substrate mixed with silt. Other species of seagrass are also present in this habitat and 62 macroalgal species. Algae with short life cycles, mostly red algae, dominate, with epiphytic and unattached forms usually prevailing over epilithic forms.

Indicators of quality:

Leaf length, biomass, shoot density have all been identified has indicators of quality. In Romania the following thresholds have been defined: Low fragmentation of habitat; cover of *Z. noltei* inside the meadow ≥50%; leaf length in June ≥70 cm; annual outward growth of rhizomes from the meadow ≥70 cm; above-ground biomass of *Z. noltei* in June ≥1,600 g/m[2.]

Characteristic species:

Zostera noltei is the dominant seagrass species. It may form pure stands or be found in association with *Zostera marina, Ruppia maritima* and *R. cirrhosa*. Algae commonly found include *Cladophora albida*

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

EUNIS (2004):

Level 4. A sub-habitat of 'Pontic Sublittoral macrophyte-dominated sediment' (A5.5).

Annex 1:

1110 Sandbanks slightly covered all the time

1160 Large shallow inlets and bays

MAES:

Marine - Marine inlets and transitional waters

Marine - Coastal

MSFD:

Shallow sublittoral sand

EUSeaMap:

Shallow sands

IUCN:

9.4 Subtidal sandy

9.9 Seagrass (submerged)

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

Justification
There is insufficient knowledge and information on this habitat to state whether it is an outstanding example of this biogeographic 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)
Black Sea	Black Sea: Present Sea of Marmara: Uncertain	Unknown Km^2	Decreasing	Stable

Extent of Occurrence, Area of Occupancy and habitat area

	Extent of Occurrence (EOO)	Area of Occupancy (AOO)	Current estimated Total Area	Comment
EU 28	Unknown Km^2	Unknown	Unknown Km^2	The habitat is known to occur in the Black Sea but there is insufficient data to accurately calculate EOO and AOO.
EU 28+	Unknown Km^2	Unknown	Unknown Km^2	The habitat is known to occur in the Black Sea but there is insufficient data to accurately calculate EOO and AOO.

Distribution map
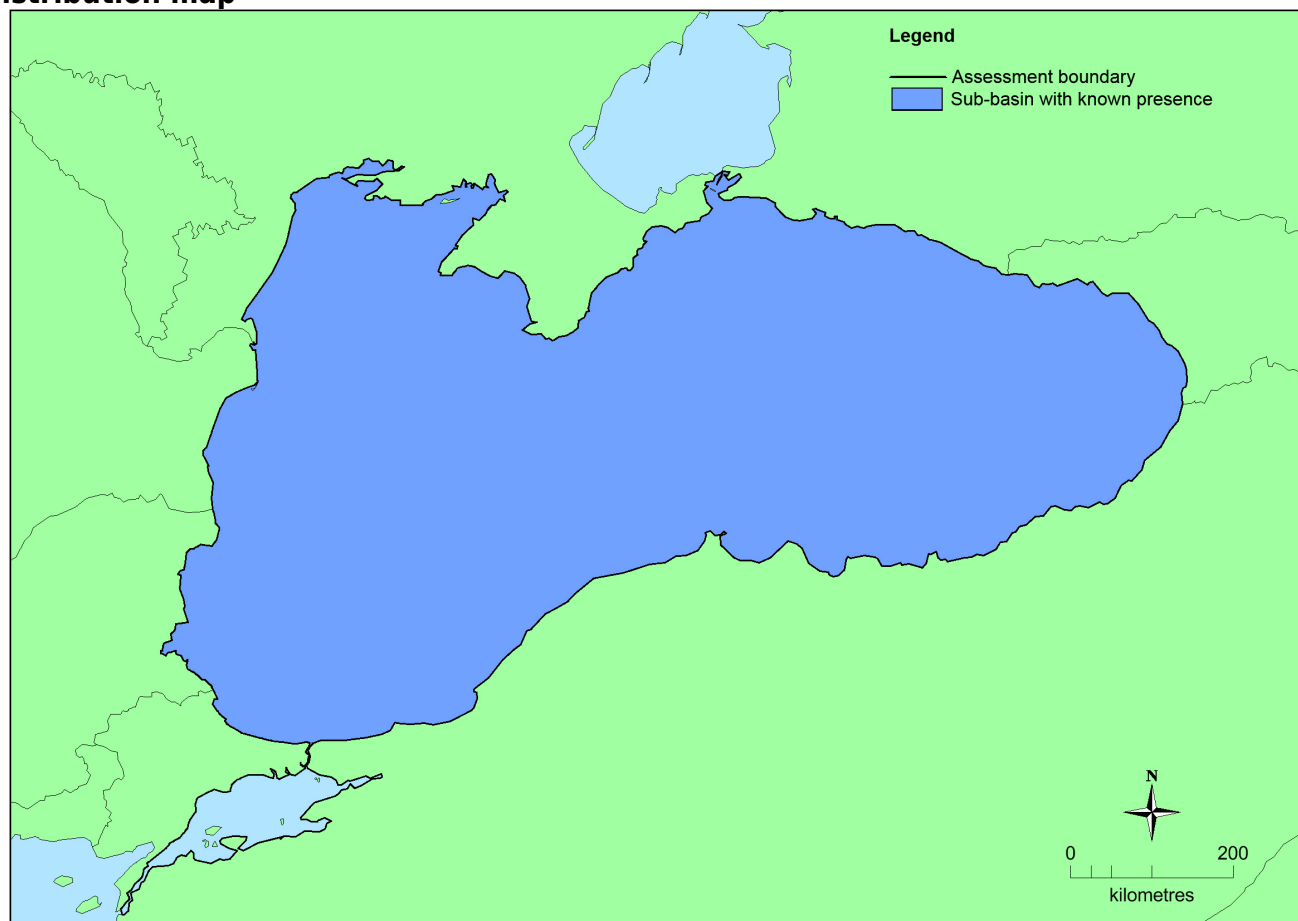
There is insufficient data to produce a map of the distribution of this habitat.

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

It is unknown how much of this habitat is hosted by the EU28 in the Black Sea.

Trends in quantity

During the period up to the 1990s widespread and severe eutrophication occurred in the Black Sea. This was most notable in the western Black Sea. This caused a significant reduction in extent. In the 1980s around Romania, Bulgaria and the Kerch Strait this habitat was near collapse. In Romania the reduction in extent is estimated at 95%. At Tendrovsky Bay in Ukraine losses of between 70 and 80% have been recorded. A similar trend is also seen along the Sevastopol coast in Crimea where between 40 and 80% of the habitat has been lost. There has been recovery since 2000 but not in deeper areas due to a continued lack of water clarity caused by eutrophication. The quantity of the habitat is now increasing but is yet to reach previous levels. This recovery has not been experienced around Crimea, largely due to the continued development in the area. Coastal development (i.e. hydrotechnical works) have further contributed to these losses in Romania. This has led to a total loss of large areas of meadows in the Razim-Sinoe lagoons. Major losses of shallow meadows have also occurred along the coast due to coastal protection and harbour building works.

Turkish data on this habitat is sparse. However, there are three bays with the habitat in western Turkey which have been well studied. In these locations the habitat has remained stable in extent since 1992. Little data exists on the extent of this habitat along Turkey's eastern coastline except Sinop area. However, it could be speculated that there has been a decline due to the development of a coastal road in the area. There is no data on the effect of eutrophication in this area.

As a whole there has been an increase in biomass of *Zostera noltei*. The species has now begun to expand into areas previously occupied by *Zostera marina*. This is probably because *Z. marina* has a lower recoverability like in other regional seas

Coastal development continues to put pressure on this habitat across the entire Black Sea. This has been particularly noted at certain sites in Crimea which have experienced large losses due to dredging activities (e.g. Sevastopol coast and Balaklava Bay).

- Average current trend in quantity (extent)
  EU 28: Increasing
  EU 28+: Increasing
- Does the habitat type have a small natural range following regression?
  Unknown
  Justification
  The habitat is known to occur in the Black Sea but there is insufficient data to accurately calculate EOO and AOO. There is insufficient data to accurately assess whether the habitat has undergone a significant decline (>25% of extent) in the last 50 years.
- Does the habitat have a small natural range by reason of its intrinsically restricted area?
  Unknown
  Justification
  There is insufficient data and knowledge on this habitat to state whether it has a small natural range by reason of an intrinsically restricted area.

Trends in quality

In the last 50 years (1965 to present day) the quality has decreased in Romania and Bulgaria. This has been witnessed since 1980s due to the effects of eutrophication. The decline in quality has been

experienced in parallel with the decline in quantity. The reduction in quality has been defined by: meadow fragmentation, reduced depth distribution, reduced cover and leaf length, reduced diversity of associated communities, anthropogenic substrate degradation. In Ukraine and Crimea there is a general trend of decline and recovery. For instance, data from Tendrovsky Bay has seen biomass decrease from 3,728 to 456.5 g/m^2 between 1973 and 1990. Where more recent data is available (e.g. Sevastopol coast) biomass has increased between 1984 and 2008. It has now recovered to levels seen in 1972. There is no quality data available from Turkey.

In the last 10 years it has been recorded that Z. noltei has seen the less vegetative growth, but more reproductive growth producing seeds.

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

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 member states surrounding the Black Sea which are not bound by the agreements such as the Water Framework Directive (WFD).

Coastal developments including the construction of marinas and slipways, sediment extraction, the widening and dredging of channels, creation of artificial beaches, road developments and sea defences. These activities may alter the hydrological regime, which will in turn affect the character and viability of the habitat.

Seagrass rhizomes are sensitive. The leaves can easily be damaged by motor boats and boat moorings. Meadows in shallow waters are also at risk of disturbance due to bait digging and trampling.

List of pressures and threats

Urbanisation, residential and commercial development

    Other urbanisation, industrial and similar activities

Biological resource use other than agriculture & forestry

    Professional active fishing

Human intrusions and disturbances

Outdoor sports and leisure activities, recreational activities
    Motorised vehicles
Other human intrusions and disturbances
    Trampling, overuse

Pollution

    Nutrient enrichment (N, P, organic matter)

Conservation and management

The habitat is a characteristic feature of several habitat types listed in Annex 1 of the Habitats Directive

like 1110 1150 and 1160

Conservation and management measures which would benefit this habitat include implementing measures to maintain physical and biological integrity, including pollution control and regulation; improvement of water quality management outside EU member states; coastal development controls; contingency plans to be followed in the event of a major pollution incident; survey and monitoring programmes; raised public awareness of ecological value and vulnerability; enhanced legal protection for occurrences of the habitat and key species (e.g. additions to the EU Habitats Directive, establish a unified list of Black Sea species and habitats requiring conservation measures, etc.); and the designation of MPAs.

List of conservation and management needs

Measures related to marine habitats

Other marine-related measures
Restoring marine habitats

Measures related to spatial planning

Establish protected areas/sites
Legal protection of habitats and species

Measures related to hunting, taking and fishing and species management

Regulation/Management of fishery in marine and brackish systems

Conservation status

Annex 1:

1110: MBLS U1

1160: MBLS U1

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

There is insufficient data and knowledge of this habitat to assess its capacity to recover

Effort required

10 years
Unknown

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 insufficient data to apply Criterion A. Evidence of spatial decline exists but there is insufficient data on extents before declines began to make conclusions.

Criterion B: Restricted geographic distribution

Criterion B	B1				B2				B3
	EOO	a	b	c	AOO	a	b	c	
EU 28	unknown Km^2	Unknown	Unknown	unknown	unknown	Unknown	Unknown	unknown	unknown
EU 28+	unknown Km^2	Unknown	Unknown	unknown	unknown	Unknown	Unknown	unknown	unknown

The precise extent of the habitat is unknown. Therefore there is insufficient data to produce EOO and AOO figures.

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%

Experts consider there to be insufficient data to conduct an assessment using 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.

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	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD
EU28+	DD	DD	DD	DD	DD	DD	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
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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References

Afanasiev D. F., Korpakova I. G. 2008. *Macrophytobenthos Russian Azov-Black Sea*., Rostov-on-Don: FGUP AzNIIRH.

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

Bacescu, M. C., Muller G. I., Gomoiu, M-T. 1971. Cercetari de ecologie bentica in Marea Neagra (analiza cantitativa, calitativa si comparata a faunei bentice pontice). Ecologie Marina vol. IV. Editura Academiei R.S.R., Bucuresti, 357 pp..

Bacescu M., 1977. Les biocenoses benthiques de la Mer Noire. *Biologie des eaux saumatres de la Mer Noire, Premiere partie*: 128-134.

Chernyakov D. A. 1995. *Natural-aquatic landscape complexes of the Tendra and Egorlyk bays and monitoring of their state in Black Sea Biosphere Reserve*

Kalugina-Gutnik A. A. 1970. *The composition and distribution of benthic vegetation in the south-eastern part of the Black Sea. Ecological and morphological studies of benthic organisms*. Kiev: Naukova Dumka, p. 185- 202.