A1.1xx- Turf algae on Pontic moderately exposed lower mediolittoral rock.

Summary

The habitat is present throughout the Black Sea on areas of moderately exposed bedrock and boulders in the lower mediolittoral zone. It is typically a narrow zone characterised by a cover of algal turf, particularly erect and crustose coralline algae. It is also present in the Sea of Marmara. The habitat was first described in 2006/2007. From the 1970s, the most significant pressure was eutrophication. After peaking in the 1980s, eutrophication has since reduced due to tighter controls on pollution in the catchment of the Danube and other rivers which enter the north-west Black Sea as well as industrial decline after the dissolution of the Soviet Union. Coastal development leading to habitat destruction and siltation is also a threat. This habitat is currently protected within marine protected areas (MPAs) and Natura 2000 sites in Romania and Bulgaria. This can be supported by restrictions on coastal developments and efforts to improve water quality (especially in non-EU states).

Synthesis

This habitat has a limited geographical range within the Black Sea EU 28 countries, and has been subject to declines in quantity and this trend is considered likely to continue within the next 20 years.

This habitat has therefore been assessed as Endangered for the EU 28. Because of the wide geographical distribution in the Black Sea it has been assessed as Least Concern for the EU 28+.

There is insufficient data to asses this habitat based on other criteria.

Overall Category & Criteria			
EU 28		EU 28+	
Red List Category	Red List Criteria	Red List Category	Red List Criteria
Endangered	B1b	Least Concern	-

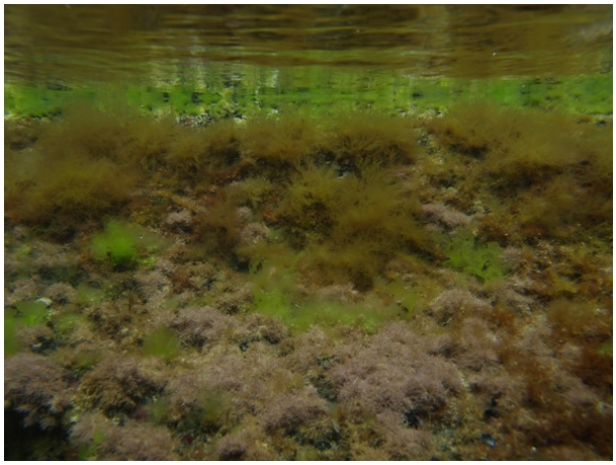
Sub-habitat types that may require further examination

None

Habitat Type

Code and name

A1.1xx- Turf algae on Pontic moderately exposed lower mediolittoral rock.



Turf Algae on Pontic moderately exposed lower mediolittoral rock in Mirius Bay,

Turf of *Corallina officinalis* on moderately exposed lower mediolittoral rock in

Maslen Nos area, Bulgaria (© D.Micu)

Tyulenovo Sarmatian limestone cliffs, Bulgaria (© D. Micu)

Habitat description

Moderately exposed bedrock and boulders in the lower mediolittoral zone with a cover of algal turf. High and constant humidity, strong wave action and strong light are the dominant environmental factors for this habitat. In the Black Sea lower mediolittoral rock is a narrow zone located in the lower part of the swash zone and is covered by water most of the time. The habitat is found on rocky coasts in relatively pristine conditions.

Indicators of quality:

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 specifc habitat are the cover of corallines (erect and crustose; >80%), height of erect corallines (>25 mm), lack of ephemeral green and red algae and cyanobacteria.

Characteristic species:

Encrusting corallines *Lithophyllum incrustans*, articulated corallines *Corallina officinalis* and ephemeral macrophytes like *Ulva compressa*, *Cladophora* sp. and Ceramiales make up the algal cover. Characteristic fauna includes the chiton *Lepidochitona caprearum,* the limpet *Patella caerulea,* barnacles *Balanus improvisus,* anemones *Diadumene lineata,* mussels *Mytilaster lineatus* and *Mytilus galloprovincialis*, bryozoans, amphipod (*Hyale pontica*, *Ampithoe ramondi*) and isopod (*Idotea balthica*, *Sphaeroma pulchellum*) crustaceans, and the crabs *Pachygrapsus marmoratus* and *Eriphia verrucosa*. If the water is clean *Corallina* and *Mytilaster* may form dense turfs/belts, with sparse cover of other algae (Ceramiales, *Porphyra leucosticta, Ulva rigida, Scytosiphon lomentaria).* In degraded, enriched areas *Mytilus galloprovincialis* and *Balanus improvisus* dominate, with some cover of the algae *Cladophora vagabunda, Cladophora laetevirens, Ulva compressa, Ulva intestinalis,* and *Ulothrix flacca.*

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-habitats of 'Pontic littoral rock' (A1.1).

Annex 1:

1170 Reefs

MAES:

Marine - Marine inlets and transitional waters

Marine - Coastal

MSFD:

Littoral rock and biogenic reef

EUSeaMap:

Not mapped

IUCN:

12.1 Rocky shoreline

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

Regions
Black

Justification
The habitat is widespread in the region with a species composition that is confined to the Black Sea. The Mediterranean has a comparable habitat but with a different species composition.

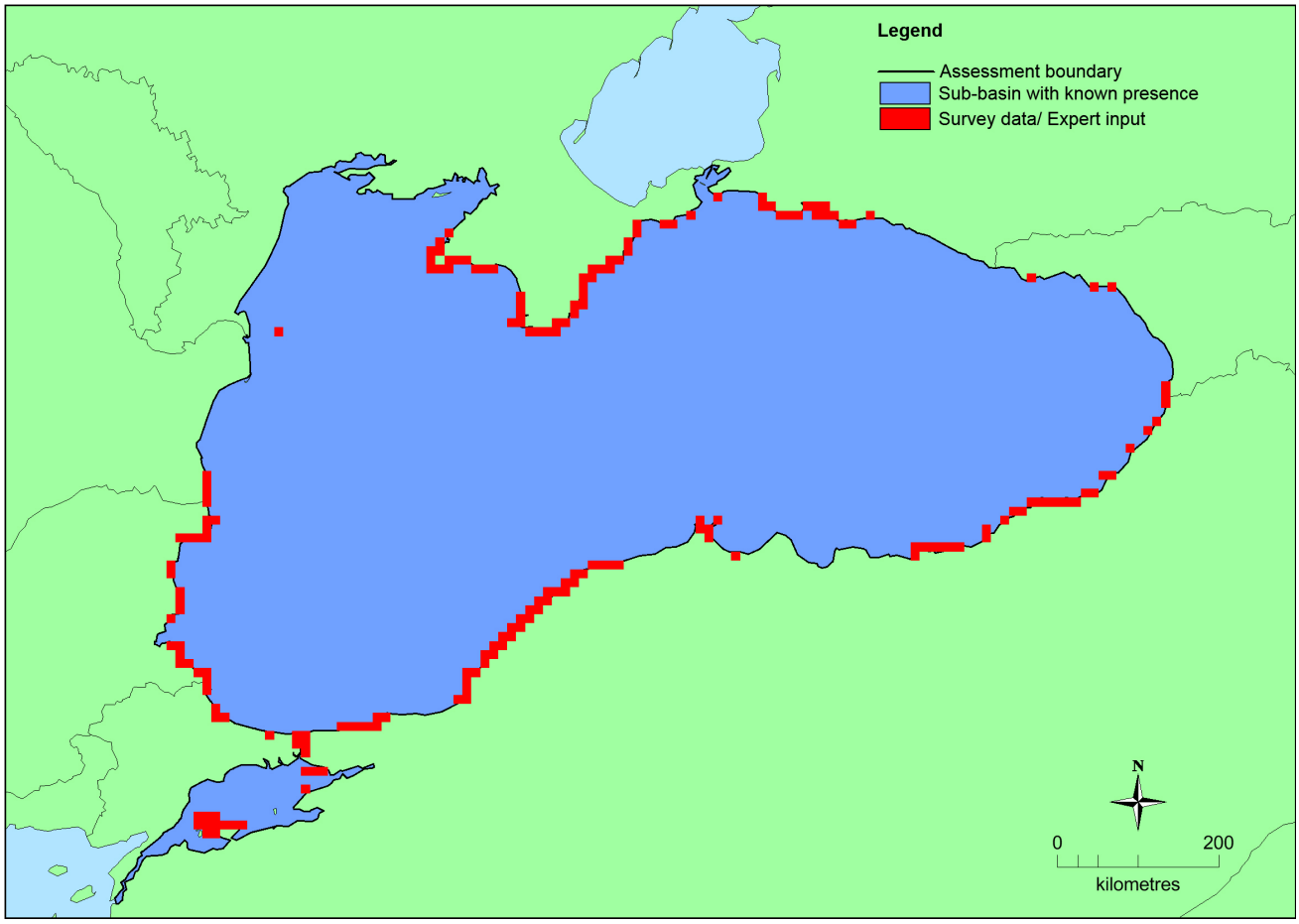
Geographic occurrence and trends

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: Present	Unknown Km^2	Unknown	Unknown

Extent of Occurrence, Area of Occupancy and habitat area

	Extent of Occurrence (EOO)	Area of Occupancy (AOO)	Current estimated Total Area	Comment
EU 28	10,743 Km^2	25	Unknown Km^2	Area estimates are available at some localities. These are a small proportion of the total area. It is possible to infer presence based on certain conditions. However, the total area is unknown.
EU 28+	502,742 Km^2	187	Unknown Km^2	Area estimates are available at some localities. These are a small proportion of the total area. It is possible to infer presence based on certain conditions. However, the total area is unknown.

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 13% of this habitat is estimated to be hosted by the EU 28 in the Black Sea.

Trends in quantity

As this habitat was first described 2006/2007, no quantitative or qualitative data are available from the historic period (pre-1965). However, expert opinion suggests that the habitat was widespread across natural rocky coasts, especially around the rocky cliffs of Bulgaria, Crimea, Turkey and southern Romania.

For the recent period (1965 to present) there are no quantitative or qualitative data to indicate changes in quantity. However, expert opinion is that the extent is likely to have declined significantly due to eutrophication. Between the mid-1970s and the early 1990s, widespread and severe eutrophication occurred in the Black Sea, especially on the north-west shelf, caused by agricultural run-off to rivers entering the sea, and coastal industrial development.

Habitat destruction (due to coastal development) is also likely to have caused a decline in extent. For instance, there has been widespread destruction of natural rocky substrates in the Bosporus Strait (Turkey) and Romania.

In the future the habitat is expected to recolonise natural rocky substrates where they remain since eutrophication pressure has reduced since the 1990s. Studies in Crimea have shown that this habitat can colonise artificial hard substrates, providing pressures from eutrophication and other factors remain low.

- Average current trend in quantity (extent)
  EU 28: Unknown

EU 28+: Unknown

- Does the habitat type have a small natural range following regression?
  No
  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 is likely to have undergone an important decline in the last 50 years, especially true in the western Black Sea (see Trends in Quantity). However, this decline has now halted and the extent of the habitat is stable.
- Does the habitat have a small natural range by reason of its intrinsically restricted area?
  No
  Justification
  The habitat can be found on exposed mediolittoral rocks. These are present throughout the Black Sea.

Trends in quality

No quantitative or qualitative data exist for the historic (pre-1965) period. However, expert opinion is that the quality is likely to have been high and stable.

No quantitative or qualitative data exist for the present (1965 to present day) period. However, expert opinion is that the quality is likely to have declined based on knowledge of the habitats sensitivity towards eutrophication and development pressures. As these pressures increased throughout the 1980s and 1990s the rate of decline is also likely to have increased.

In future, the quality of the habitat is likely to improve as long as the current environmental conditions remain stable.

Overall the quality of this habitat is considered stable.

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

Pressures and threats

Eutrophication as a result of nutrient enrichment (N, P and organic matter) was the most significant historic pressure on the habitat. Between the mid-1970s and the mid 1980s, widespread and severe eutrophication occurred in the Black Sea, especially on the north-west shelf, caused by agricultural run-off to rivers entering the sea, and coastal industrial development. Whilst this pressure is now reduced, it remains a threat in the current and future periods, especially along coastal parts of non-EU countries which are not bound by legislation such as the Water Framework Directive (WFD) or Marine Strategy Framework Directive.

Coastal development, which can lead to habitat destruction and siltation, is a threat of current and future importance in all parts of the Black Sea. In Romania, Bulgaria, Crimea and the Caucasus intensive hotel development and the creation of artificial beaches are a threat to the underlying substrate. In Turkey, proposed road developments also threaten the substrate.

Collecting *Patella caerulea* for food or bait is a threat to the species composition of the habitat. This species plays a role in maintaining the habitats' structure and functionality by grazing the softer algal cover.

List of pressures and threats

Urbanisation, residential and commercial development

Urbanised areas, human habitation

Biological resource use other than agriculture & forestry

Fishing and harvesting aquatic resources

Pollution

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

Natural System modifications

Siltation rate changes, dumping, depositing of dredged deposits

Conservation and management

The habitat is protected within MPAs and Natura2000 sites in Romania and Bulgaria. In Romania Natura2000 sites have been designated specifically to protect this habitat.

In the future more protected areas should be designated to protect the habitat. This can be supported by restrictions on coastal developments and efforts to improve water quality (especially in non-EU states).

List of conservation and management needs

Measures related to marine habitats

Other marine-related measures

Measures related to spatial planning

Other spatial measures
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:

1170: MBLS U1

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

The habitat can recover naturally providing suitable substrate is present. However, there is no knowledge of the time required for recovery to take place.

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 %

Evidence of spatial decline exists but there is insufficient data on the extent of this habitat before declines began to make conclusions. This habitat has therefore been assessed as Data Deficient under criteria A for both the EU 28 and the EU28+.

Criterion B: Restricted geographic distribution

Criterion B	B1				B2				B3
	EOO	a	b	c	AOO	a	b	c	
EU 28	10,743 Km^2	No	Yes	No	25	No	Yes	No	No
EU 28+	>50,000 Km^2	No	Unknown	No	>50	No	No	No	No

The AOO and EOO are intrinsically small for the EU states. Declines in spatial extent, abiotic and biotic quality have halted. There is the potential for declines to continue in Bulgaria within the next 20 years due to coastal development. 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 Endangered under criteria B1b, Vulnerable under criteria B2b for the EU 28 and Least Concern for all other criteria for both the EU 28 and 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 %	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 to assess reductions in abiotic and/or biotic quality.

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	EN	VU	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
Endangered	B1b	Least Concern	-

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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