

A1.44 Pontic mediolittoral caves and overhangs

Summary

This habitat is present around the Black Sea in limestone cliffs and possibly volcanic and metamorphic rock. Where caves and overhangs occur on rocky shores, the shaded nature of the habitat diminishes the amount of desiccation suffered by biota during Aeolian periods of low water which allows certain species to proliferate. Historically the most significant pressure has been eutrophication, which is likely to have caused the greatest reductions in quality. This was most acutely experienced in the north-west Black Sea where there are high riverine inputs. Since the dissolution of the Soviet Union and subsequent economic collapse, industrial effluent discharge into the sea all but ceased (but could resume in future). Also, a reduction of transboundary pollution resulted from implementation of the WFD and DRPC, and extension of EU membership to Central Europe, leading to a reduction in the pressures. Coastal development, unsupervised tourism and rubbish dumping are further pressures known to affect the quantity and quality of the habitat.

Synthesis

In the EU 28 the habitat type is assessed as Endangered under Criterion B1 and B2. The EOO is 6,248 km². The AOO is km². There is a continuous decline in quality due to rubbish dumping and unsupervised tourism, solely based on expert opinion.

In the EU 28+ the habitat type is assessed as Least Concern under Criterion A1 and B. There has been a decline in extent of <25% in the last 50 years, based on expert opinion. The threatened categories for AOO and EOO are not met for Criterion B

Current total area of the habitat is unknown.

In the historic period (pre-1965) the habitat extent is believed to have remained stable in Turkey and Bulgaria as caves are typically located in steep cliffs in remote areas, which are unsuitable for development. In the recent past (1965 to present day) the habitat extent has remained stable and expert opinion is that this is predicted to remain the case in the future.

In the historic period (pre-1965) the quality of caves and overhangs are believed to have been stable. The Monk Seal (*Monachus monachus*) regularly used caves for breeding (based on expert opinion).

In the recent past (1965 to present day) the quality is believed to have remained stable in Turkey. Quality declines are believed to have occurred in Bulgaria associated with eutrophication, rubbish dumping and disturbance by tourists (based on expert opinion of the habitat and its likely response to known pressures). For instance, 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 and is likely to have caused a decline in biotic quality of the habitat as some quality indicators (e.g. sponges) are highly sensitive to these conditions.

In the future the habitat quality is expected to remain stable in Turkey because of the remote localities and low development pressure. In Bulgaria and Crimea peninsula the quality will depend on levels of protection, providing pollution control and regulations on rubbish dumping and unsupervised tourism are enforced.

Overall Category & Criteria			
EU 28		EU 28+	
Red List Category	Red List Criteria	Red List Category	Red List Criteria

Overall Category & Criteria			
Endangered	B1a,b,c and B2a,b,c.	Least Concern	-

Sub-habitat types that may require further examination

None

Habitat Type

Code and name

A1.44 Pontic mediolittoral caves and overhangs



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



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

Habitat description

Where caves and overhangs occur on rocky shores, the shaded nature of the habitat diminishes the amount of desiccation suffered by biota during Aeolian periods of low water which allows certain species to proliferate. In addition, the amount of scour, wave surge, sea spray and penetrating light determines the unique community assemblages found in upper, mid- and lower shore caves and overhangs on the lower shore. All around the Black Sea this habitat type occurs in the Sarmatian limestone cliffs in Russia, Ukraine, Romania, Bulgaria and Turkey. It may also occur in volcanic and metamorphic rocks, such as Maslen Nos Cape in Bulgaria. The height of the entrance varies from 50 cm up to 25 m depending on the strength of the waves. The length of the water gallery is between 3 and 50 m and is sometimes followed by dry or semi-dry galleries with sand, gravel and larger stones. Natural light does not reach the inner reaches of the longest caves. The temperature strongly depends on the situation outside the cave, although fluctuations are smaller and no extremely high or low values have been recorded.

Indicators of quality:

Biotic indicators of good quality include the presence of sponge assemblages and the abundance and extent of sponge crusts. Abiotic indicators of good quality include water quality (i.e. low nutrients: N, P) and absence of rubbish. There is insufficient information to set indicator thresholds required for monitoring purposes.

Characteristic species:

During the warm season some of the larger caves are inhabited by colonies of bat species (*Miniopterus schreibersii*, *Myotis blythii*, *Myotis myotis* and *Myotis capaccinii*). Birds may often also nest at the entrance of the caves. Caves with sandy underground banks were once regularly inhabited by the Monk Seal (*Monachus monachus*), which is now extinct in the Black Sea. The marine part of the caves is covered

by invertebrate- dominated communities. Sciaphilic algae is only present at or near the entrance, where there is still some, albeit diminished, light. Most frequent at the entrance are the red alga *Phyllophora crispa* and the brown alga *Zanardinia typus*, while inside the cave only encrusting algae (*Hildenbrandia*, *Lithophyllum*, *Phymatolithon*) occur. The completely dark interior is dominated by either hydrozoan and bryozoan turfs or extensive sponge crusts (erect sponges *Halichondria*, *Haliclona*, *Dysidea* spp. or thin crust sponges), depending on current intensity.

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. A sub-habitat of 'Littoral rock' (A1).

Annex 1:

8830 Submerged or partially submerged sea caves

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?

No

Justification

Caves are characteristic where geological conditions are suitable (erodable rocky cliffs). They are not widespread along the Black Sea coast.

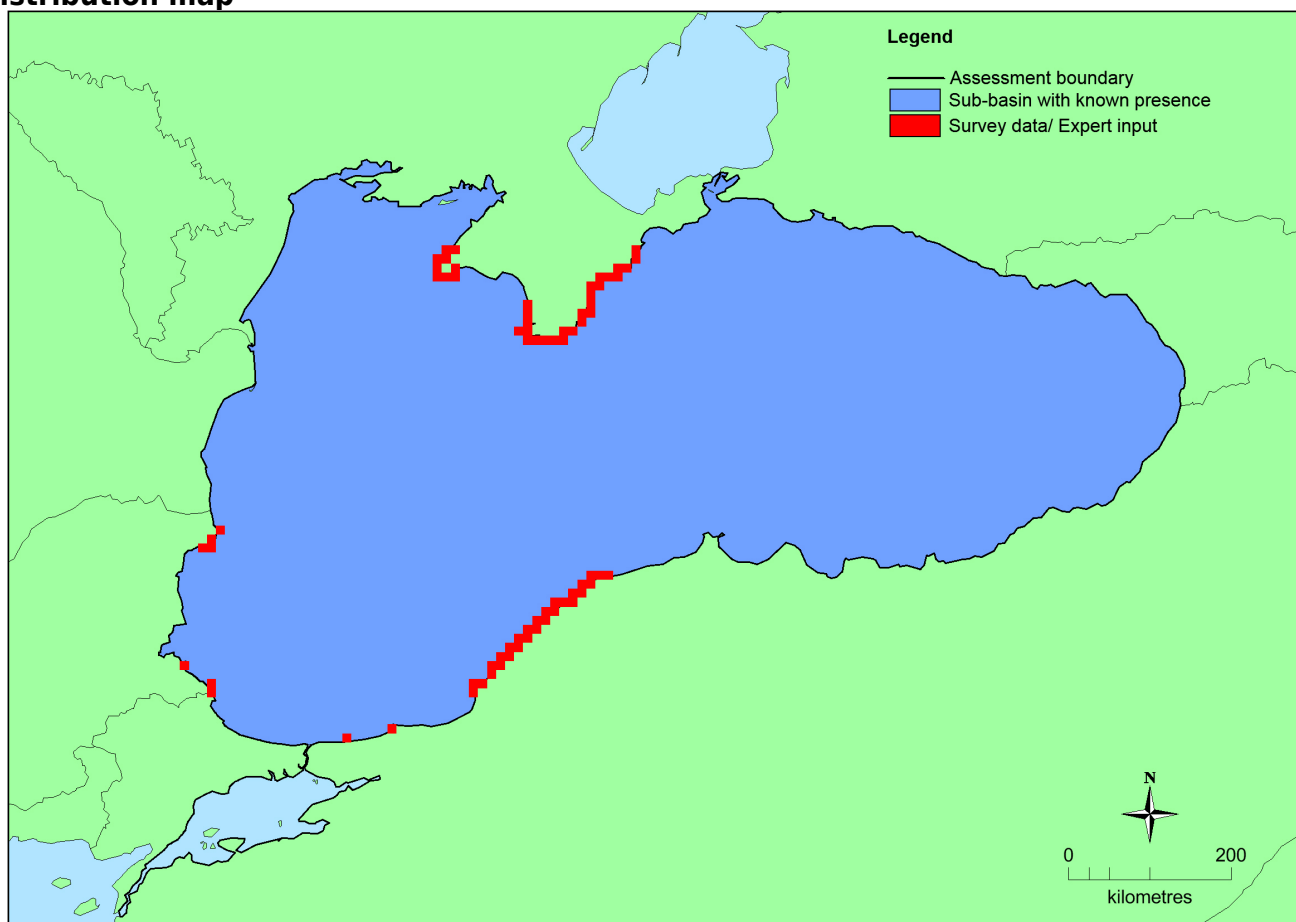
Geographic occurrence and trends

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	Stable	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	6,248 Km ²	7	Unknown Km ²	Current total area of the habitat is unknown.
EU 28+	199,003 Km ²	73	Unknown Km ²	Current total area of the habitat 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 11% of this habitat is estimated to be hosted by the EU28 in the Black Sea.

Trends in quantity

Current total area of the habitat is unknown. Area estimates are available at some localities however, these are only a small proportion of occurrence.

In the historic period (pre-1965) the habitat extent is believed to have remained stable in Turkey and Bulgaria as caves are typically located in steep cliffs in remote areas, which are unsuitable for development.

In the recent past (1965 to present day) the habitat extent has remained stable and expert opinion is that this is predicted to remain the case in the future.

- Average current trend in quantity (extent)

EU 28: Stable

EU 28+: Stable

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

No

Justification

The habitat has a small range in the EU 28 countries only, but this is not believed to be associated with an important decline during the last 50 years. In the EU 28+ the EOO exceeds 50,000 km² therefore it does not have a small natural range.

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

Yes

Justification

The habitat can only occur in certain rock types (Sarmatian limestone, igneous rock and calcarenite) and the distribution of these is very restricted. The EOO in the EU 28 countries is also less than 50,000 km².

Trends in quality

In the historic period (pre-1965) the quality of caves and overhangs are believed to have been stable. The Monk Seal (*Monachus monachus*) regularly used caves for breeding (based on expert opinion).

In the recent past (1965 to present day) the quality is believed to have remained stable in Turkey. Quality declines are believed to have occurred in Bulgaria associated with eutrophication, rubbish dumping and disturbance by tourists (based on expert opinion of the habitat and its likely response to known pressures). For instance, 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 and is likely to have caused a decline in biotic quality of the habitat as some quality indicators (e.g. sponges) are highly sensitive to these conditions.

In the future the habitat quality is expected to remain stable in Turkey because of the remote localities and low development pressure. In Bulgaria and Crimea peninsula the quality will depend on levels of protection, providing pollution control and regulations on rubbish dumping and unsupervised tourism are enforced.

- 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. 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 agreements such as the Water Framework Directive (WFD).

Coastal development in the future could lead to habitat destruction. However, most localities are remote and undesirable from a development perspective. Therefore the threat of this pressure is relatively low.

Rubbish dumping can affect the abiotic quality of the habitat and any resulting abrasion can damage the structure of the habitat (e.g. sponges and other invertebrates). Oil and other chemicals can reduce the water quality resulting in a reduction in sensitive species such as sponges.

Unsupervised tourism can reduce the biotic quality of the habitat through disturbance and displacement of

species.

Coastal erosion can reduce and increase the extent of the habitat. In severe cases erosion of caves can lead to caves collapsing and habitat destruction. This is a natural process which is unlikely to lead to a significant loss in a short time period. It should also be noted that surge gullies, caves and overhangs are formed as a result of erosion. Therefore the loss of any features is likely to be balanced by the formation of new features over time.

List of pressures and threats

Urbanisation, residential and commercial development

Other urbanisation, industrial and similar activities

Human intrusions and disturbances

Outdoor sports and leisure activities, recreational activities

Pollution

Nutrient enrichment (N, P, organic matter)

Input of contaminants (synthetic substances, non-synthetic substances, radionuclides) - diffuse sources, point sources, acute events

Oil spills in the sea

Input of litter (solid waste matter)

Natural biotic and abiotic processes (without catastrophes)

Erosion

Conservation and management

Some caves and overhangs are found within protected areas which provide protection from development. However, marine littering and unsupervised tourism remain pressures in these areas.

In the future, regulations on rubbish dumping and unsupervised tourism need to be enforced to improve the conservation status of the habitat.

List of conservation and management needs

Measures related to wetland, freshwater and coastal habitats

Restoring/Improving water quality

Measures related to marine habitats

Other marine-related measures

Measures related to spatial planning

Establish protected areas/sites

Measures related to urban areas, industry, energy and transport

Urban and industrial waste management

Conservation status

Annex 1-type:

8330: MBLs, U1

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

New caves and overhangs, can form over time but only through natural processes. Intervention is unlikely to increase the extent of this habitat. The habitat will recover naturally from quality degradation. Intervention can also be used to improve the quality of the habitat by controlling rubbish dumping and pollution.

Effort required

10 years
Naturally

Red List Assessment

Criterion A: Reduction in quantity

Criterion A	A1	A2a	A2b	A3
EU 28	<20 %	unknown %	unknown %	unknown %
EU 28+	<20 %	unknown %	unknown %	unknown %

Since 1965 there is not believed to have been a decline >20% of habitat extent or distribution (based on expert opinion). This habitat has therefore been assessed as Least Concern under criterion A.

Criterion B: Restricted geographic distribution

Criterion B	B1				B2				B3
	EOO	a	b	c	AOO	a	b	c	
EU 28	7,381 Km ²	Yes	Yes	Yes	7	Yes	Yes	Yes	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. There have been significant declines in the recent past which have left the habitat in a fragile state. Declines in abiotic and biotic quality are likely to continue due to weak enforcement of regulations but are not likely to become critically endangered or collapsed within a very short time period. This habitat has therefore been assessed as Endangered under criteria B1 and B2. The threshold values for threatened categories are not met 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 %	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 has been some decrease in the quality of this habitat over the last 50 years although the extent is difficult to quantify. Some continuing decline is predicted due to continuing pressures (recreational, coastal development and pollution).

This habitat has been assessed as Data Deficient under criteria C/D1.

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	EN	EN	LC	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD
EU28+	LC	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	B1a,b,c and B2a,b,c.	Least Concen	-

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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