A1.41: Communities of Mediterranean mediolittoral rockpools

Summary

This habitat is found in the intertidal zone and forms discrete patches along the Mediterranean coast. It is structured by a complex set of physical and biological factors that create great variability of rockpools. Information of its distribution in the Mediterranean is scarce with only a few studies providing data on the
structure of assemblages in this habitat.

Although the habitat might be impacted by anthropogenic impacts in the intertidal and shallow coastal region, the communities are adapted to rapidly changing conditions and could be fairly resilient to such impacts. Nonetheless, their recover capacity depends on the characteristics of the different rockpools. The main pressures are pollution from marine and terrestrial activities and habitat modification from coastal development. Because rockpools lie at the land and sea interface, the macroalgal assemblages are also expected to be strongly influenced by climate change and the combined effects of elevated CO_2 and temperature. Conservation and management measures which would benefit this habitat are mostly general rather than specific measures. They include pollution control and regulation, development control.Further work is needed to know its complete distribution and its conservation status in the Mediterranean.

Synthesis

There is a lack of published data on trends of this habitat and very little available information about its extent of occurrence or its area of occupancy. There have been no quantitative analyses examining the probability of extinction of the rockpools and the pressures affecting their quality. This habitat has a large EOO and AOO, and therefore qualifies as Least Concern under criterion B. However the habitat is assessed as Data Deficient both at the EU 28 and EU 28+ levels because of a lack of information on any trends in quantity and quality.

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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Mediolittoral rockpool fringed with green algae along the Catalan coast, Spain (© Littoral Cartography Group, CEAB, CSIC).

Habitat description

Rockpools occur where the topography of the shore allows seawater to be retained within depressions in the bedrock. As the associated communities are permanently submerged they are not directly affected by height on the shore and normal rocky shore zonation patterns do not apply. Factors such as pool depth, surface area, volume, orientation to sunlight, shading, internal topography, sediment content and type, together with wave exposure, shore height, and hence flushing rate, and the presence of absence of freshwater runoff, results in large spatial variation in community structure, even between adjacent pools at
the same shore height.

The provision of seawater to this habitat can be completely interrupted during long periods of calm sea conditions. In these cases, the habitat may face important changes in temperature, pH, salinity and oxygen concentration. Nitrogen concentration is very often high and seasonal changes more abrupt than
in the adjacent, regularly swashed communities. In these conditions, the development of macroalgal communities is hindered and green algae can dominate. Large numbers of benthic species and juvenile stages of some commercial species of fish may be present in rockpools.

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 over time.

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. Most of the associated species are opportunistic and show high turnover however changes in species richness and percent algae cover could indicate changes in the quality of the environment.

Characteristic species:

Rhodophyta (red algae): *Ceramium ciliatum, Gelidium pusillum, Ellisolandia elongata, Polysiphonia sertularioides, Hildenbrandia rubra, Neogoniolithon brassica-florida, Lithophyllum incrustans.*

Phaeophyta (brown algae): *Scytosiphon lomentaria, Petalonia fascia, Sphacelaria cirrosa, Cystoseira compressa.*

Chlorophyta (green algae): *Cladophora vagabunda, Chaetomorpha aerea, Ulva rigida, Ulva compressa, Ulva fasciata, Cladophora albida, Cladophora laetevirens, Cladophora dalmatica.*

Cyanophyta (blue-green algae): *Calotrix crustacea.*

Gastropoda: *Echinolittorina puncatata, Melaraphe neritoides, Phorcus turbinatus, Patella rustica.*

Cirripedia: *Chthamalus montagui.*

Decapoda: *Pachygrapsus marmoratus.*

Echinodermata: *Paracentrotus lividus, Arbaxia lixula*

Classification

EUNIS (v1405):

Level 4. A sub-habitat of A1.4 Features of littoral rock.

Annex 1:

1160 Large shallow inlets and bays

1170 Reefs

MAES:

Marine - Coastal

Marine - inlets and transitional waters

MSFD:

Littoral rock and biogenic reef

EUSeaMap:

Not mapped

IUCN:

12.1 Rocky shoreline

Barcelona Convention (RAC/SPA):

I. 4. 1. Biocenosis of supralittoral rock

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

No

Justification

Rock pools are widespread and common on rocky shores however as there is a limited tidal range in the

Mediterranean they are perhaps not typical of the biogeographical region.

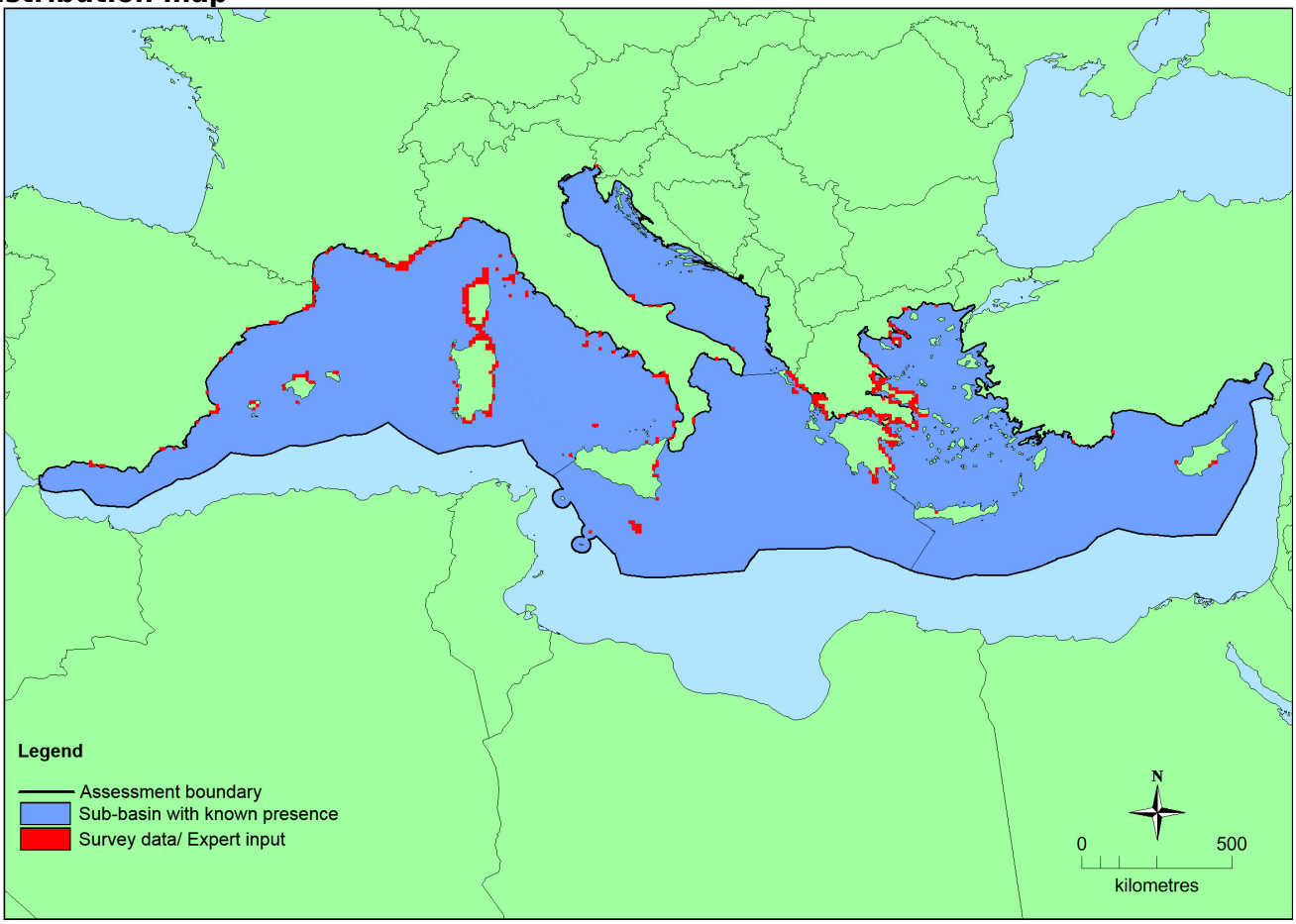
Geographic occurrence and trends

Region	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
Mediterranean Sea	Adriatic Sea: Present Aegian-Levantine Sea: Present Ionian Sea and the Central Mediterranean Sea: Present Western Mediterranean Sea: 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	2,208,801 Km^2	455	Unknown Km^2	
EU 28+	2,208,801 Km^2	457	Unknown Km^2	

Distribution map



This map has been generated using data from IUCN and the European Environment Agency (EEA), and supplemented with expert opinion (Bernhard Lehner and Petra Doell. World Wildlife Fund US, Washington DC, USA. Center for Environmental Systems Research, University of Kassel, Germany). 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?

This habitat does occur in the EU 28+ but the percentage is unknown.

Trends in quantity

There is a lack of information on the extent and trends in the quantity of this habitat. Given the scale of coastal development and the numerous waterfront developments along the Mediterranean coast, it can be inferred that some losses of this habitat has occured in the past. However, information to estimate these losses with the current and more precise distribution of this habitat is not available.

- 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
  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?
  Unknown
  Justification
  This habitat does have an intrinsically restricted area but does not have a small natural range as the EOO is larger than 50,000 km^2 .

Trends in quality

There are a few site-specific studies on trends in the quality of this habitat but insufficient information to determine overall trends in quality in the Mediterranean region.

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

Pressures and threats

The habitat is very unstable as it faces severe natural changes in environmental conditions. As a consequence most of the associated species are opportunistic and show a high turnover. The isolation from nearby seawater over long periods may cause strong evaporation, anoxia and salinity increments which could get worse with changes due to climate change and pollution. Recreational activities particularly during the summer season affect this habitat with the pressure on use on some sites and often the disposal of litter on the shore.

List of pressures and threats

Pollution

Pollution to surface waters (limnic, terrestrial, marine & brackish)
Nutrient enrichment (N, P, organic matter)
Oil spills in the sea
Toxic chemical discharge from material dumped at sea
Marine macro-pollution (i.e. plastic bags, styrofoam)
Input of litter (solid waste matter)

Climate change

Temperature changes (e.g. rise of temperature & extremes)

Wave exposure changes
Sea-level changes

Conservation and management

Conservation and management measures which would benefit this habitat are mostly general rather than specific measures. They include pollution control and regulation, development control and contingency plans to be followed in the event of a major pollution incident and measures to reduce global warming and sea level rise. Beneficial actions include mapping of the distribution of this habitat in the Mediterranean and the associated species, monitoring representative sites to examine trends in quantity and quality and further evaluation of the main pressures and required conservation actions to safeguard and restore this habitat where it has been degraded.

List of conservation and management needs

Measures related to wetland, freshwater and coastal habitats

Restoring/Improving water quality

Measures related to spatial planning

Other spatial measures
Establish protected areas/sites

Conservation status

Annex 1

1160: MMED XX

1170: MMED XX

This habitat does not have a particular status under the Barcelona Convention. It is listed as an Endangered habitat type under the Annex I of Convention on the Conservation of European wildlife and natural habitats (Bern Convention).

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

The heterogeneity of this habitat in terms of rock pool size, shape, assemblage composition and hervibores determine its recovery capacity. If conditions reverse, the habitat might be able to recover relatively quickly but this is largely dependant on the previous conditions and their effects.

Effort required

10 years
Naturally

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 no country specific data on the quanity of this habitat and insufficient information to determine overall trends. This habitat ha therefore been assessed as Data Deficient under Criterion A.

Criterion B: Restricted geographic distribution

Criterion B	B1				B2				B3
	EOO	a	b	c	AOO	a	b	c	
EU 28	>50,000 Km^2	Unknown	Unknown	No	>50	Unknown	Unknown	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 western and eastern Mediterranean. The precise extent is unknown however as EOO >50,000km^2 and AOO >50, this exceeds the thresholds for a threatened category on the basis of restricted geographic distribution. Trends are unknown. 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 under criteria B1(c) B2 (c) and B3 and 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%

The assessment of reduction in abiotic and/or biotic quality is difficult due to the lack of studies and data on past and present state conditions of rockpool habitats for the Mediterranean. At present, it is not possible to calculate the reductions in abiotic and/or biotic quality, although slight changes have been reported in the abiotic conditions of this habitat at several sites. This habitat has therefore been assessed as Data Deficient under Criterion C/D1 both at EU 28 and EU 28+ levels.

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	DD	DD	DD	DD	LC	LC	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
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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