

A3.3X/3.33 Macaronesian submerged fucoids, green or red seaweeds on full salinity infralittoral rock

Summary

This habitat, found throughout the Macaronesian islands, in rocky infralittoral areas and is characterised by the presence of many photophilic algae. The species and associated biotopes are strongly influenced by light levels with green algae such as *Codium* species in the shallowest lightest conditions, fucoids (e.g. species of *Cystoseria* and *Sargassum*), and in areas of low light intensity red algae such as *Botryocladia* spp., *Halymenia* spp. and, *Sebdenia* spp. There is an abundant and diverse associated fauna including molluscs, crustaceans echinoderms and numerous fish.

The main threat to this habitat is related to the high intensity of urban coastal development which has taken place on the most populated islands of Macaronesia in recent decades. This has exerted significant pressures on coastal habitats and can have a detrimental effect on adjacent sublittoral habitats such as this. Fishing and poaching activities are other important indirect causes of habitat degradation in the infralittoral zone. The increase of international maritime traffic in the harbours of the main cities of the Canary Archipelago and, more recently, oil-platform maintenance work, are a potential entrance vector for marine exotic species although any ecological effects on Macaronesia habitats have not been yet evaluated.

Beneficial measures include the regulation of coastal development and of discharges to the marine environment as well as controls on the introduction of invasive species. Marine Protected Areas which include this habitat can act as a focus for the introduction of such measures.

Synthesis

There is insufficient information to determine historical, current or future trends in quantity or quality of this habitat although it is considered likely to decline in the future if conservation measures are not introduced.

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 given the lack of information on its trends in quantity and quality and the fact that its overall distribution is unknown.

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

A3.3X/3.33 Macaronesian submerged fucoids, green or red seaweeds on full salinity infralittoral rock



The green alga *Codium decorticatum* growing amongst pebbles. Porto Santo, Madeira (© R.Haroun).

Habitat description

This habitat is found throughout the Macaronesian islands in rocky infralittoral areas and is characterised by the presence of many photophilic algae.

In shallow waters 2-3m around the Azores the habitat is dominated by *Codium fragile* although in places the invasive species *C. fragile* spp. *tomentosoides* has also become established. In the southern Macaronesian archipelagos of Madeira, Selvagen and the Canaries other *Codium* spp. are characteristic elements of this habitat either as conspicuous narrow belt of crustose species (*C. intertextum*, *C. adhaerens*) in the infralittoral fringe, globose to subglobose, somewhat flattened specimens of *C. elisabethiae* / *C. bursa*, or frondose and large specimens in crevices and overhangs (*C. taylorii*) or attached to pebbles (*C. decorticatum*).

In shallow sublittoral rocks, it is also possible to find the biotope of the green macroalgae *Dasycladus vermicularis* - *Halimeda discoidea* - *Acetabularia acetabulum* with the gasteropod *Elysia timida*. Where there is some organic matter sedimentation the red algae *Halopithys incurva*, *Digenea simplex*, *Rytiphlaea tinctoria* and *Alsidium corallinum* are more common.

The fucoids *Cystoseira mauritanica*, *C. tamariscifolia* and sometimes, *C. abies-marina* and *c. foeniculacea*, *Sargassum vulgare* - *S. desfontainesii* - *S. furcatum* are the main elements of other biotopes, with many marine invertebrates associated (copepods, amphipods, hydrozoans, etc.). A seasonal biotope during spring - summer months is characterized by *Sporochnus* spp.

In deeper waters with low light intensity the associated biotopes include those characterised by the red macroalgae *Botryocladia*, *Halymenia*, *Sebdenia* and less frequently *Kallymenia*. In some detritic sediments, the introduced tropical green seaweed *Caulerpa racemosa* var. *cylindracea* could be observed between 10 - 50 m. depth. Associated species are the polychaete *Ditrupa arietina*, decapods such as *Paromola cuvieri* and *Cancer bellianus*, bryozoans of the genus *Cupuladria* and the sea urchins *Cidaris cidaris* and *Genocidaris maculata*.

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.

Characteristic species:

In the Canary Islands, common associated species are the anthozoan *Palythoa canariensis* and the bivalve *Spondylus senegalensis* as well as the red macroalgae *Nemastoma canariensis* and the sponges *Aplysina aerophoba* e *Ircinia spp.* The Azores archipelago is the southwestern limit of distribution of *Codium fragile ssp. atlanticum* but the invasive species *C. fragile ssp. tomentosoides* has also established successful populations in the archipelago.

The biodiversity of these biotopes is high, with the dominant macroalgal species associated with other macroalgae, such as the perennial species *Halopteris scoparia* *Cladostephus spongiosus* and *Padina pavonica* or the annual green macroalgae *Acetabularia acetabulum*. Among these species it is possible to observe turf species, such as *Ellisondia elongata* *Jania rubens*, *Jania corniculata* or *Haliptilon virgatum*, *Amphiroa rigida*, erect species such as *Liagora distenta*, *Hypnea musciformis*, *H. cervicornis*, or epiphytes as *Falkenbergia rufolanosa*. Among gastropod molluscs, *Haliotis tuberculata*, *Gibbula spp.*, *Rissoa spp.*, *Aplysia spp.*, *Elysia timida*, *Ocenebra erinacea*, *Ocenebrina edwardsi*, *Stramonita haemastoma* and *Nassarius incrassatus* are observed. The most common echinoderms are *Sphaerechinus granularis*, *Paracentrotus lividus* and *Arbacia lixula* (sometimes also the long spined sea urchin *Diadema africanum*) and the seastar *Echinaster sepositus*. The ichthyofauna is diverse and common species are *Sparus aurata*, *Sciaena umbra*, *Ephinephelus marginatus* and *Hippocampus hippocampus*.

Classification

EUNIS (2004):

Level 4. A sub-habitat of 'Atlantic and Mediterranean low energy infralittoral rock' (A3.3) modified to incorporate Macaronesian habitats.

Annex 1:

1170 Reefs

MAES:

Marine - Marine inlets and transitional waters

Marine - Coastal

MSFD:

Shallow sublittoral rock & biogenic reef

EUSEaMap:

Shallow photic rock or biogenic reef

IUCN:

9.2 Subtidal rock and rocky reefs

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

Unknown

Justification

There is insufficient information to determine whether this habitat is an outstanding example of typical characteristics of the North East Atlantic region.

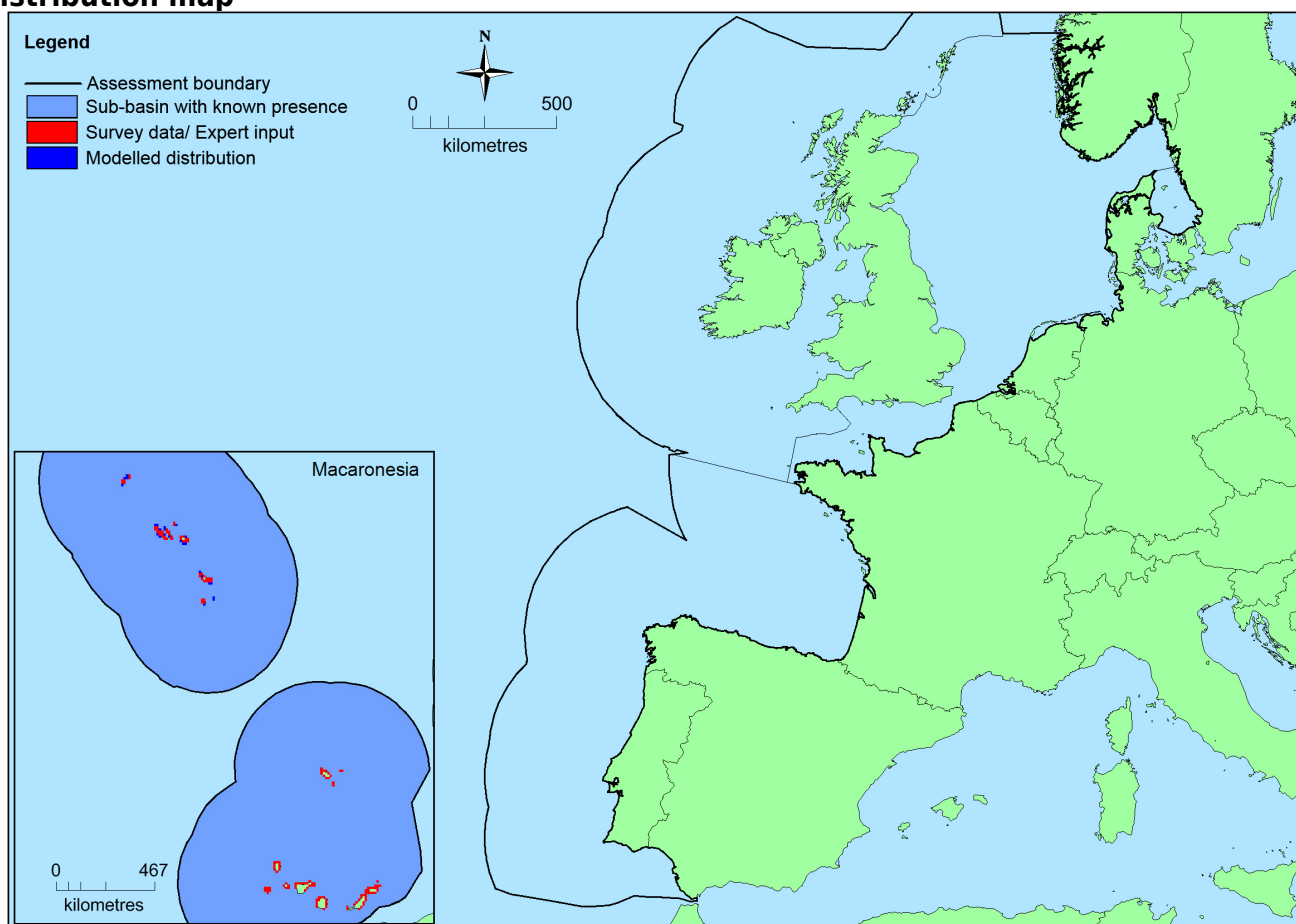
Geographic occurrence and trends

Region	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
<i>North-East Atlantic</i>	Macaronesia: 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
<i>EU 28</i>	718,914 Km ²	173	Unknown Km ²	EOO and AOO have been calculated on the available data. Although this data set is known to be incomplete the figures exceed the thresholds for threatened status.
<i>EU 28+</i>	718,914 Km ²	173	Unknown Km ²	This habitat does not occur outside the EU28

Distribution map



There are insufficient data to provide a comprehensive and accurate map of the distribution of this habitat. This map has been generated using EMODnet data from modelled/surveyed records for the North East Atlantic (and supplemented with expert opinion where applicable) (EMODnet 2010). 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 is not the full distribution of the habitat.

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

100% is hosted by EU 28 in the North East Atlantic Macaronesian region.

Trends in quantity

There is insufficient information on past extent of this habitat to determine historical trends in quantity. As it occurs in shallow waters which are subject to different degrees of human pressures such as habitat destruction or modification it is considered likely to decline in the future if conservation measures are not introduced.

- 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 it is present in the Azores, Madeira and Canary Islands.

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

No

Justification

This habitat does not have a small natural range as it is present in the Azores, Madeira and Canary Islands.

Trends in quality

There is insufficient information about this habitat to determine historical trends in quality. As it occurs in shallow waters which are subject to different types and degrees of human pressures such as habitat destruction or modification it is considered likely to decline in the future if conservation measures are not introduced.

- Average current trend in quality

EU 28: Unknown

EU 28+: Unknown

Pressures and threats

The main threat to this habitat is related to the high intensity of urban coastal development which has taken place on the most populated islands of Macaronesia in recent decades. Harbour construction and tourism resorts have exerted significant pressures on coastal habitats and can result in increased sedimentation and changes in the hydrogeological regime, with detrimental effects on adjacent sublittoral habitats such as this. Illegal fishing and poaching activities have become important indirect causes of habitat degradation in the infralittoral zone. Poorly managed waste disposal and sewage discharge can be an additional pressure.

The increase of international maritime traffic in the harbours of the main cities of the Canary archipelago

and, more recently, oil-platform maintenance work, may potentially lead to the introduction of marine exotic species. The ecological effects of such species in Macaronesian habitats have not been evaluated.

List of pressures and threats

Urbanisation, residential and commercial development

- Urbanised areas, human habitation
- Discharges

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)
- Marine water pollution

Invasive, other problematic species and genes

- Invasive non-native species

Conservation and management

This habitat is included within some Marine Protected Areas where there are associated management measures, regulations and codes of conduct but not necessarily targetting this specific habitat. Regulation of coastal development and discharges to the marine environment and control of activities that might lead to the introduction of invasive species are other measures that could benefit this habitat.

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

Measures related to urban areas, industry, energy and transport

- Urban and industrial waste management
- Managing marine traffic

Conservation status

Annex 1:

1170: MMAC FV.

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

There is insufficient information to determine whether this habitat retains the capacity to recover when severely damaged.

Effort required

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 %

This habitat is only present in the EU 28 in the North East Atlantic region. There is insufficient information on the past extent of this habitat to determine historical trends in quantity. As it occurs in shallow waters, in areas subject to pressure from development, it is considered likely to decline in the future if conservation measures are not introduced. The scale of any such future decline cannot be estimated at the present time. This habitat has therefore been assessed as Data Deficient under criterion A for both the EU 28 and EU 28+.

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	Yes	No	>50	Unknown	Yes	No	No
EU 28+	>50,000 Km ²	Unknown	Yes	No	>50	Unknown	Yes	No	No

This habitat has a large natural range in the North East Atlantic region. The precise extent is unknown however as EOO >50,000 km² and AOO >50, this exceeds the thresholds for a threatened category on the basis of restricted geographic distribution. Past trends are unknown and it is considered likely to decline in the future if conservation actions are not taken. 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(b,c) B2 (b,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%

This habitat occurs in the infralittoral zone of the Macaronesian islands which are subject to different types and degrees of human pressures such as habitat destruction or modification. There is insufficient information to determine historical or future trends in quality although it is considered likely to decline in quality in the future if conservation measures are not introduced. This habitat has therefore been assessed as Data Deficient under 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	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)

Assessors

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Reviewers

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