

## A3.2x Macaronesian seaweed communities on moderate energy infralittoral rock

### Summary

This infralittoral habitat occurs on bedrock and boulders in areas that are subject to moderately strong to weak tidal streams. It is present on all the Macaronesian archipelagos although different associated biotopes may be present depending on location. Two associated biotopes have been described in the Azores archipelago. The first is dominated by *Codium elisabethae*, *Halopteris filicina* and coralline crusts and the second by the green alga *Caulerpa webbiana* which was first reported in the Azores in 2002. In the southern Macaronesian archipelagos, a more diverse set of biotopes characterised by algae are recognised as well as the barren grounds created through the actions of sea urchins such as *Diadema africanum*.

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 Canaries 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 because of the lack of information on its area and 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	-

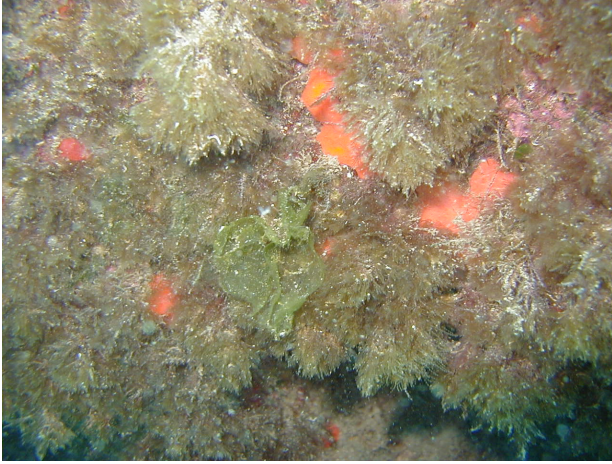
### Sub-habitat types that may require further examination

None.

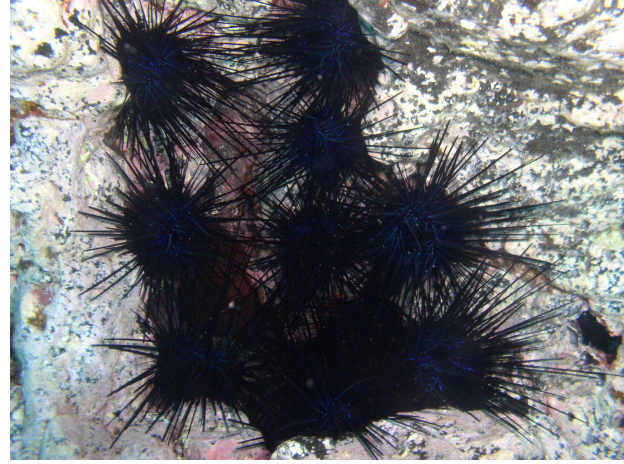
### Habitat Type

#### Code and name

A3.2x Macaronesian seaweed communities on moderate energy infralittoral rock



Abundant turf of *Halopteris filicina* on rock surfaces. Porto Santa, Madeira, Portugal (© R.Haroun).



Barren grounds biotopes of this habitat are characterised by an abundance of the sea urchin *Diadema africanum*. Canary Islands, Spain (© R.Haroun).

## Habitat description

This habitat occurs predominantly on moderately wave-exposed bedrock and boulders, that are subject to moderately strong to weak tidal streams. Two associated biotopes have been described in the Azores archipelago. The first is dominated by *Codium elisabethae*, *Halopteris filicina* and coralline crusts on moderate to sheltered bedrock. The second is characterised by dense patches of the green alga *Caulerpa webbiana*. This species was first reported in the Azores in 2002 and although not considered an invasive species in other parts of Macaronesia or the world it has many characteristics of such a species in the Azores.

In the southern Macaronesian archipelagos, a more diverse sub-set of habitats are recognised, such as that defined by *Stypocaulon scoparium* / *Halopteris filicina* (A3.2X3), more frequent in Azores and Madeira archipelagos and with fewer locations in Selvagem and the Canary Islands.

Other representative biotopes in the Canarian archipelago are barren grounds of the long spined sea urchin *Diadema africanum* (A3.2X4) or those constructed by other sea urchin species *Arbacia lixula* or *Paracentrotus lividus* on shallower infralittoral volcanic rocks (A3.2X5). *Corynactis viridis* defines another interesting biotope (A.3.2X6) mainly associated with sea urchins whereas different zooantids, such as *Isaurus tuberculatus*, *Zoanthus spp.* and *Palythoa spp.* are characteristic elements of another biotope (A3.2X7) in hard bottoms.

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 barren ground biotope, the associated species are the damselfish *Chromis limbata*, the arrow crab *Stenorhynchus lanceolatus*, the shrimp *Tuleariopsis neglecta* and the parasitic mollusc *Echineulima leucophaes*. The floristic component is very sparse with small specimens of the genera *Dyctiota*, *Lobophora* and *Liagora*.

Other introduced species like the red algae *Asparagopsis* spp. and the ascidean *Distaplia corolla* are the most common associated biota with the *Caulerpa* biotope in Azorean waters. Associated biota in the *Codium* biotope includes *Zonaria tournefortii*, *Bryopsis* spp., encrusting brown algae, *Microdictyon calodictyon* and the boring sponge *Cliona celata*. Associated biota in the *Halopteris filicina* biotope are *Padina pavonica*, *Asparagopsis* spp., *Zonaria tournefortii* and the sea urchin *Arbacia lixula*.

## Classification

EUNIS:

Proposed new level 4 of the EUNIS classification (2004) to incorporate Macaronesian level 5 habitats. A sub-habitat of 'Atlantic and Mediterranean moderate energy infralittoral rock' (A3.2).

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

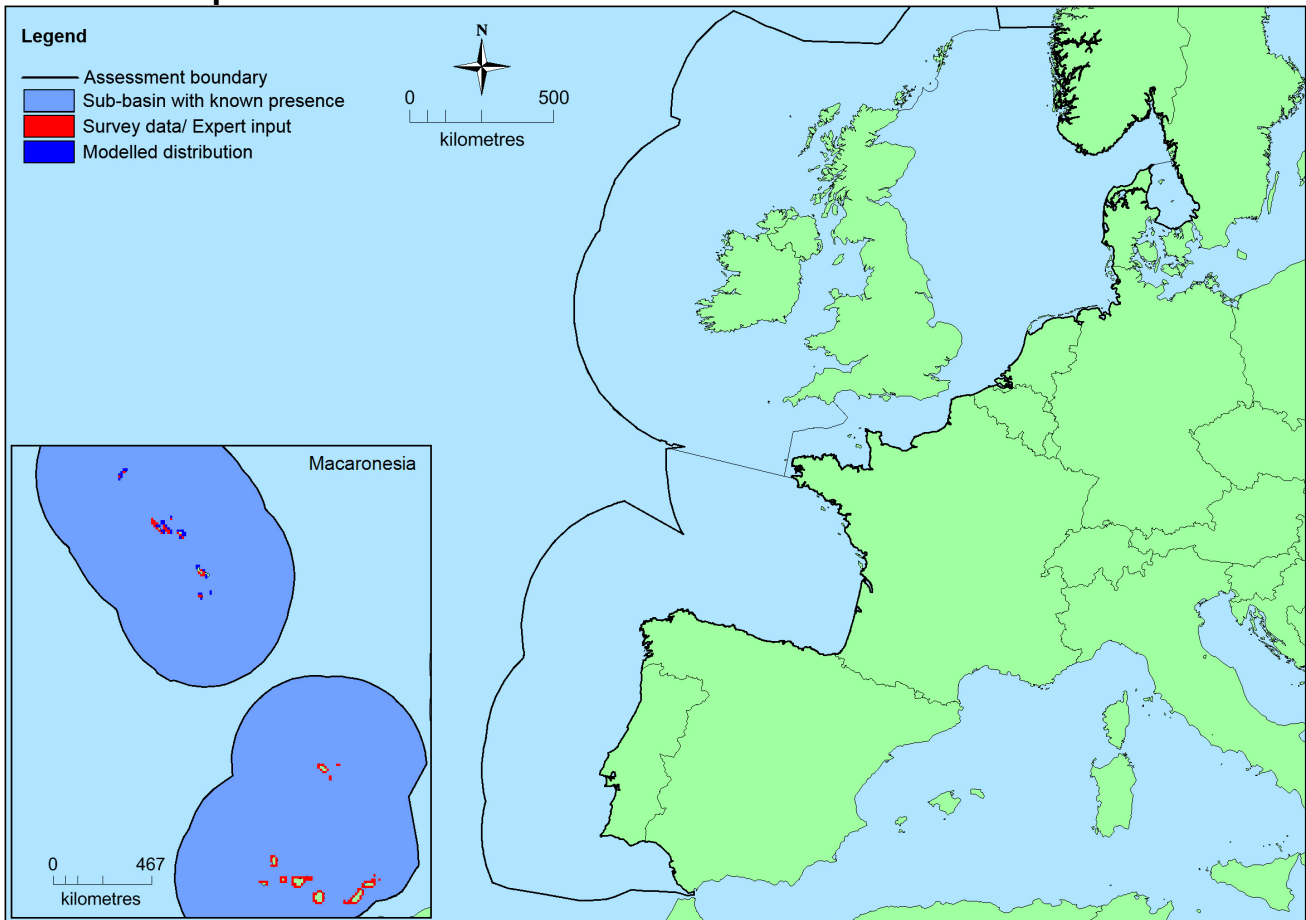
### Geographic occurrence and trends

Region	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
North-East Atlantic	Macaronesia: Present	Unknown Km <sup>2</sup>	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	725,661 Km <sup>2</sup>	178	Unknown Km <sup>2</sup>	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.
EU 28+	725,661 Km <sup>2</sup>	178	Unknown Km <sup>2</sup>	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 Macaronesian region of the North East Atlantic.

### 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 types and degrees of human pressures such as habitat destruction or modification (such as eutrophication processes) 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 occurs in the Azores, Madeira and the 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 occurs in the Azores, Madeira and the 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 degrees of human pressures such as habitat destruction or modification (such as eutrophication processes), 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**

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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. 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 but this is less likely given the exposed conditions where this habitat occurs.

The increase of international maritime traffic in the harbours of the main cities of the Canaries 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

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This habitat is included within some Marine Protected Areas where there are associated management measures, regulations and codes of conduct but not necessarily targeting this specific habitat. Regulation of coastal development, discharges to the marine environment and control on activities that may potentially 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

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

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### 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 criteria A.

### Criterion B: Restricted geographic distribution

Criterion B	B1				B2				B3
	EOO	a	b	c	AOO	a	b	c	
EU 28	>50,000 Km <sup>2</sup>	Unknown	Yes	No	>50	Unknown	Yes	No	No
EU 28+	>50,000 Km <sup>2</sup>	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 >50,000km<sup>2</sup> and AOO >50, this exceeds the thresholds for a threatened category on the basis of restricted geographic distribution. Historical trends are unknown but there may be declines in the future. 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

	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	LC	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

S. Wells.

### Date of assessment

09/10/2015

### Date of review

16/01/2016

## References

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