

### H3.3 Macaronesian inland cliff

#### Summary

The perennial vegetation of crevices and ledges of cliff faces in Macaronesia away from coastal salt-spray is of very diverse character - some, for example, dominated by succulents, others rich in ferns and bryophytes characteristic of shaded situations - and it includes several hundreds of taxa endemic to the archipelagoes. The main threats are mountaineering and rock climbing, outdoor sports and leisure activities, and construction of infrastructures such as roads and motorways.

#### Synthesis

There is no evidence of significant past reductions, either in the last 50 years or historically, and also future prospects are good, as no serious threats are envisaged, besides touristic/leisure activities and putative faulty environmental impact assessments that may overlook this habitat as valuable. Reduction in quantity, reduction in quality and criteria of geographic distribution yield the Least Concern (LC) category. In spite of the LC category, conservation policy and management should restrict to the maximum any threat to or reduction of the habitat, as it has a very high conservation value, because of high endemism of species and communities with many local and regional varieties.

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

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

Four general subtypes can be distinguished based on species composition and different ecological conditions. However, at present, no data are available to carry out an individual assessment of each of them. In the future, if detailed plot sampling has been carried out, such an evaluation may be possible.

#### Habitat Type

##### Code and name

H3.3 Macaronesian inland cliff



*Aeonium glandulosum* community on cliff at the north face of Madeira (Photo: Sandra Mesquita).



*Monanthes polyphylla* subsp. *amydros* community on cliff of La Gomera, Spain (Photo: Sandra Mesquita).

## Habitat description

Perennial vegetation of rock walls not under the influence of sodium chloride of maritime origin. The habitat includes an enormous diversity of plant communities that, in turn, include several hundreds of *taxa* endemic to Macaronesia. The main large groups, that we consider as subtypes within H3.3, are: i) plant communities dominated by succulent rosetted chamaephytic *crassulaceae* (*Aeonium*, *Aichryson*, *Greenovia* and *Monanthes*) of rock surface or crevices, endemic to the Canaries and Madeira ( *Greenovio-Aeonietea* vegetation class). Although a few *taxa* reach the Azores archipelago (e.g. *Aichryson*), this vegetation type is not recognized there; ii) communities of shady, humid, earthy, rock wall surfaces dominated by ferns and mosses (*Anomodonto-Polypodietaea* vegetation class); iii) plant communities strictly of rock wall crevices directly exposed to rainfall, made up of a great diversity of habitat-specialists, both pteridophytes and vascular plants (*Asplenietaea trichomanis* vegetation class); iv) semi-nitrogen prone vegetation of rock wall crevices, including artificial old walls and buildings, dominated by hemi-cryptophytes and chamaephytes (*Parietarietaea judaicae*). The later, in spite of cosmopolitan distribution includes some endemic elements in Macaronesia. The subtypes thus considered are:

1. Succulent rosette *crassulaceae* vegetation of the Canaries and Madeira. (i) This subtype has an enormous diversity and endemism (see flora). Alliances included are *Soncho acaulis-Aeonion* (all canarian archipelago); *Greenovion aureae* (western Canaries); *Aichryso monanthesi-Monanthesion laxiflorae* (canarian and madeiran archipelagos, one taxon (*Aichryson villosum*) reaches the Azores but it belongs to subtype #2 there; *Sinapidendro-Aeonion glutinosi* (madeiran only).
2. Brio-pteridophytic shady earthy rock wall, seldom epiphytic communities of Canaries, Madeira and Azores. (ii) This subtype shares some flora with exclusively epiphytic communities (*Hymenophyllum thumbrigenis*) which is not considered here. Canaries, Madeira and Azores. The alliances included are: *Barthamio-Polypodion*, *Sellaginelo-Annogramion leptophyllae* and *Thelypterido-Woodwardion* of wet walls with large ferns.
3. Exposed rock wall crevices vegetation of the Canaries and Madeira. (iii) One alliance only: *Cheilanthes pulchellae* of xerophytic and termophyllous mafic rock crevices.
4. Semi nitrogen-prone wall vegetation. (iv) *Parietario-Galion*, *Cymbalario-Asplenion* and *Asplenion maritimi* alliances are present. All archipelagos.

Indicators of good quality:

Physiognomical integrity and presence of local/regional bioindicator sets should be maximal. Disturbance regimes, mostly soil/rock removal or removal of protective arboreal vegetation, for shade, in the case of subtype #2 are indicative of collapse/loss of ecological quality. Nitrogen-prone rock vegetation, *i.e* subtype #4 tends to dominate if disturbance increases. Sometimes type F6.8a ( macaronesian halo-nitrophyllous tender- leaf shrubs) can also tend to invade the habitat under disturbance.

Characteristic species:

*Flora*

Vascular plants:

Subtype #1 [the majority of characteristic *taxa*, but not the exhaustive list of all *taxa* to be found in the habitat]:

*Aeonium holochrysum*, *Aeonium smithii*, *Aeonium spathulatum*, *Aeonium urbicum*, *Andryala varia*, *Arabis caucasica*, *Ceterach aureum*, *Ceterach aureum var. parvifolium*, *Festuca agustini*, *Habenaria tridactylites*, *Hypericum reflexum*, *Monanthes muralis*, *Monanthes subcrassicaulis*, *Pericallis lanata*, *Rhamnus integrifolius*, *Senecio palmensis*, *Silene berthelotiana*, *Sonchus acaulis*, *Sonchus gummifer*, *Tinguarra cervariaefolia*, *Tolpis lagopoda*, *Aeonium balsamiferum*, *Aeonium canariense*, *Aeonium castello-paivae*,

*Aeonium cuneatum*, *Aeonium decorum*, *Aeonium gomeraense*, *Aeonium goochiae*, *Aeonium haworthii*, *Aeonium hierrense*, *Aeonium lancerottense*, *Aeonium manriqueorum*, *Aeonium mascaense*, *Aeonium nobile*, *Aeonium palmense*, *Aeonium percarneum*, *Aeonium rubrolineatum*, *Aeonium saundersii*, *Aeonium sedifolium*, *Aeonium subplanum*, *Aeonium tabulaeforme*, *Aeonium undulatum*, *Aeonium valverdense*, *Aeonium vestitum*, *Aeonium virgineum*, *Aeonium viscatum*, *Aeonium xburghardii*, *Aichryson bethencourtianum*, *Aichryson bollei*, *Aichryson brevipetalum*, *Allagopappus viscosissimus*, *Chrysoprenanthes pendula*, *Crambe arborea*, *Crambe laevigata*, *Crambe scaberrima*, *Dendriopoterium menendezii*, *Greenovia dodrentalis*, *Hypochoeris oligocephala*, *Micromeria teneriffae*, *Minuartia platyphylla*, *Parietaria filamentosa*, *Phyllis viscosa*, *Polycarpaea carnosae*, *Salvia broussonetii*, *Sedum lancerottense*, *Sonchus congestus*, *Sonchus radicans*, *Sonchus tectifolius*, *Sonchus tuberifer*, *Tolpis crassiuscula*, *Vieraea laevigata*, *Aeonium simsii*, *Babcockia platylepis*, *Greenovia aizoon*, *Greenovia aurea*, *Greenovia diplocycla*, *Silene pogonocalyx*, *Tolpis calderae*, *Aichryson bituminosum*, *Aichryson immaculatum*, *Aichryson laxum*, *Aichryson pachycaulon*, *Aichryson parlatorei*, *Aichryson punctatum*, *Aichryson tortuosum*, *Monanthes adenoscepes*, *Monanthes amygdros*, *Monanthes anagensis*, *Monanthes brachycaulon*, *Monanthes icterica*, *Monanthes laxiflora*, *Monanthes lowei*, *Monanthes pallens*, *Monanthes polyphylla*, *Aeonium glandulosum*, *Aeonium glutinosum*, *Aeonium x meyerheimii*, *Andryala crithmifolia*, *Crepis andryaloides*, *Galium productum*, *Matthiola maderensis*, *Micromeria thymoides* subsp. *thymoides* var. *cacuminicolae*, *Monizia edulis*, *Musschia aurea*, *Plantago leiopetala*, *Saxifraga maderensis* var. *maderensis*, *Saxifraga maderensis* var. *pickeringii*, *Sedum brissemoretii*, *Sedum farinosum*, *Sedum fusiforme*, *Sedum nudum*, *Sinapidendron angustifolium*, *Sinapidendron frutescens*, *Sinapidendron gymnocalyx*, *Sinapidendron rupestre*, *Sonchus ustulatus* subsp. *maderensis*, *Sonchus ustulatus* subsp. *ustulatus*, *Tolpis macrorhiza*, *Aichryson divaricatum*, *Aichryson dumosum*, *Aichryson villosum*, *Monanthes lowei*

#### Subtype 2#

*Davallia canariensis*, *Polypodium interjectum*, *Polypodium macaronesicum*, *Polypodium azoricum*, *Polypodium cambricum*, *Polypodium x fontqueri*, *Sellaginella denticulata*, *Asplenium hemionitis*, *Saxifraga portosanctanae*, *Annogramma leptophylla*, *Cystopteris viridula*, *Woodwardia radicans*, *Cystopteris diaphana*, *Sellaginella azorica*, *Thelypteris pozoi*, *Asplenium monanthes*

#### Subtype #3

*Asplenium adiantum-nigrum*, *Asplenium septentrionale*, *Asplenium trichomanes* subsp. *trichomanes*, *Asplenium trichomanes* subsp. *maderensis*, *Cheilanthes acrostica*, *Cheilanthes tinaei*, *Cosentinia vellaea* subsp. *bivalens*, *C. vellaea* subsp. *vellaea*, *Cheilanthes guanchica*, *Cheilantes maderensis*, *Notholaena marantae* subsp. *maranthae*, *Adiantum reniforme* subsp. *pusillum*, *A. reniforme* subsp. *reniforme*, *Asplenium aethiopicum* subsp. *aethiopicum*, *Asplenium aethiopicum* subsp. *braitwaitii*, *Asplenium monanthes*, *Cheilanthes pulchella*, *Notholaena maranthae* subsp. *cupripaleacea*, *Notholaena maranthae* subsp. *subcordata*.

#### Subtype #4.

Macaronesian endemics: *Tolpis succulenta*, *Hypericum x inodorum*, *Ceterach lolegnamense*, *Sonchus ustulatus* subsp. *maderensis*, *Sonchus ustulatus* subsp. *ustulatus*; most frequent dominant cosmopolitans: *Anthirrhinum majus*, *Chelidonium majus*, *Cymbalaria muralis*, *Cyrtomium falcatum*, *Erigeron karvinskianus*, *Parietaria judaica*, *Sonchus tenerrimus*, *Asplenium trichomanes* subsp. *quadrivalens*, *Trachelium caeruleum*, *Asplenium marinum*, *Centranthus ruber*, *Hyoscyamus albus*, *Umbilicus rupestris*.

#### Mosses (any subtype):

*Bartamia stricta*, *Exormotheca pustulosa*, *Pterogonium gracile*, *Reiboulia hemisphaerica*, *Frullania polistycha*, *Porella canariensis*, *Frullania microphylla*, *Corcenia coriandrena*, *Targionia hypophylla* (incomplete).

## Classification

This habitat may be equivalent to, or broader than, or narrower than the habitats or ecosystems in the following typologies.

EUNIS

H3.3 Macaronesian inland cliffs

EuroVegChecklist

*Soncho acaulis*- *Aeonion*

*Greenovion aureae*

*Aichryso laxi*-*Monanthes laxiflorae*

*Sinapidendro angustifolii*-*Aeonion glutinosi*

*Polypodium serrati* (includes *Sellaginella denticulatae*-*Annogrammon leptophyllae*)

*Thelipterido pozoi*-*Woodwardia radicans*

*Cheilanthes pulchellae*

*Cymbalaria*-*Asplenion*

*Galio valantiae*-*Parietaria judaicae*

*Asplenion marini*

Annex 1:

8220 Siliceous rocky slopes with chasmophytic vegetation

Emerald:

No relationship

MAES-2:

Sparsely vegetated land

IUCN:

Rocky areas [e.g. inland cliffs, mountain peaks]

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

Yes

Regions

Macaronesian

Justification

All subtypes, except #4, are defined by strict Macaronesian endemics, some even at the genus level (e.g. *Aeonium* p.max.p., *Monanthes*, *Greenovia*). Especially subtype #1 (late-deciduous rosette *Crassulaceae*) is a unique vegetation, exclusive of Macaronesian islands.

## Geographic occurrence and trends

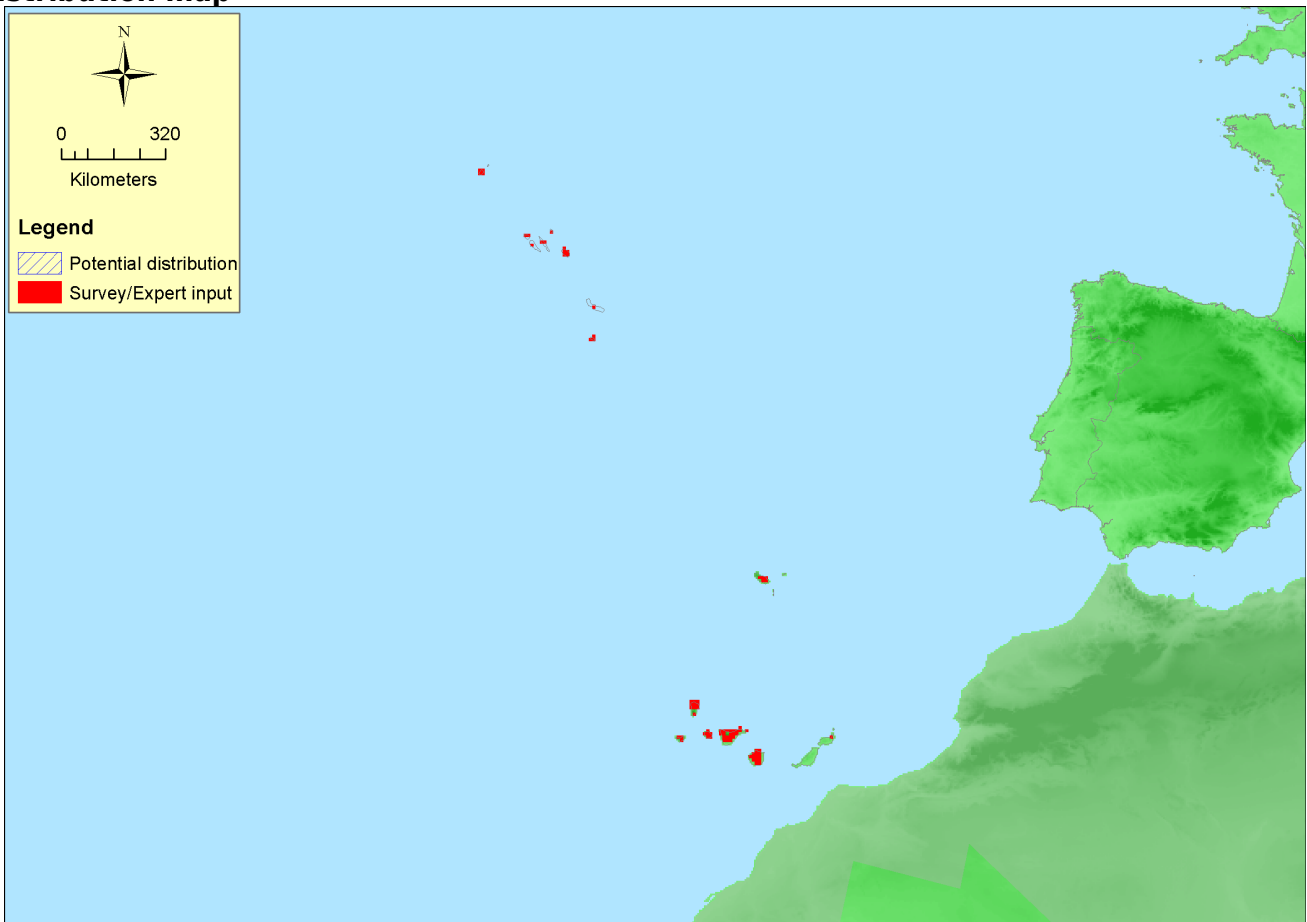
---

EU 28	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
<i>Portugal</i>	Madeira: Present Portugal Azores: Present Savage Islands: Uncertain	190 Km <sup>2</sup>	Stable	Stable
<i>Spain</i>	Canary Islands: Present	23 Km <sup>2</sup>	Stable	Stable

### Extent of Occurrence, Area of Occupancy and habitat area

	Extent of Occurrence (EOO)	Area of Occupancy (AOO)	Current estimated Total Area	Comment
EU 28	613200 Km <sup>2</sup>	79	213 Km <sup>2</sup>	
EU 28+	613200 Km <sup>2</sup>	79	213 Km <sup>2</sup>	

### Distribution map



The map is likely to be complete. Data sources: Art17.

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

100% of the habitat type lies within the EU28.

### Trends in quantity

Trends in past (50 years time span), actual and future are reported by territorial experts and taken by assessors as 'stable'.

- 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*

There is no evidence of relevant regression in habitat's area.

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

No

*Justification*

The habitat does not have a 'small' range due to EEO >50.000 Km<sup>2</sup> and AOO>50 10x10 Km gridsquares. The AOO however, is only slightly higher than the 50 grid cell threshold for criterion B2.

## **Trends in quality**

Actual, past (50 years) or future trends area appreciated as 'stable' or in worst case scenario as unknown extent affected by 'slight -0,3 severity.

- Average current trend in quality

EU 28: Stable

EU 28+: Stable

## **Pressures and threats**

---

Main threats are mountaineering & rock climbing, outdoor sports and leisure activities and construction of infrastructures such as roads and motorways.

### **List of pressures and threats**

#### **Transportation and service corridors**

Roads, motorways

Bridge, viaduct

#### **Human intrusions and disturbances**

Mountaineering & rock climbing

Trampling, overuse

## **Conservation and management**

---

Conservation of inland cliffs depends on adoption of legal planning instruments, restricting the disturbance or use of cliffs either for sport/touristic activities and avoidance of destruction by construction of infrastructures such as roads.

### **List of conservation and management needs**

#### **Measures related to spatial planning**

Establish protected areas/sites

Legal protection of habitats and species

Manage landscape features

#### **Measures related to urban areas, industry, energy and transport**

Specific management of traffic and energy transport systems

### **Conservation status**

Annex 1:

8220: MAC U2

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

Recovering of this vegetation type will be uncertain, slow and only if environmental conditions (habitat) are again met. Eventually it may slowly establish from nearby populations, if these exist. Absence of nitrates, shade (in the subtypes under shade), elimination of competing vegetation and substratum recovery would be needed (active potential habitat recovery).

### Effort required

20 years	50+ years
Through intervention	Naturally

## Red List Assessment

### Criterion A: Reduction in quantity

Criterion A	A1	A2a	A2b	A3
EU 28	0 %	0 %	0 %	unknown %
EU 28+	0 %	0 %	0 %	unknown %

No past decline has been reported, and territorial experts and assessors estimate a stable condition. Also, it is expected that the area remains stable in the future. Long-term historical changes are unknown.

### Criterion B: Restricted geographic distribution

Criterion B	B1				B2				B3
	EOO	a	b	c	AOO	a	b	c	
EU 28	>50000 Km <sup>2</sup>	No	No		79	No	No		
EU 28+	>50000 Km <sup>2</sup>	No	No		79	No	No		

The AOO values are not much higher than the thresholds for B2, but stability is assumed for the past (50 years) and future time-frame and no serious threats are envisaged, for both B1 and B2 criteria. The habitat exists at many locations.

### 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 %	30 %	unknown %	unknown %	unknown %	unknown %
EU 28+	unknown %	30 %	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%

Some influence of actual threats are assumed (see Pressures and Threats) due to road building and leisure/touristic activities, and therefore a slight severity (30%) in an unknown (but relatively small) proportion of the habitat is assumed.

### 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 that estimates 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	LC	LC	DD	LC	LC	LC	LC	DD	DD	DD	DD	DD	DD	DD	DD	DD
EU28+	LC	LC	LC	DD	LC	LC	LC	LC	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
Least Concern	-	Least Concern	-

### Confidence in the assessment

Low (mainly based on uncertain or indirect information, inferred and suspected data values, and/or limited expert knowledge)

### Assessors

J. Capelo

### Contributors

Habitats Definition: J. Capelo

Territorial data: J. Loidi, J. Capelo, D. Espírito Santo (with Miguel Sequeira and Roberto Jardim as advisors).

Working Group Sparsely Vegetated Habitats: F. Essl, G. Giusso Del Galdo, A. Mikolajczak, D. Paternoster, M. Valachovič, M. Valderrabano

### Reviewers

J. Janssen

### Date of assessment

22/10/2015

### Date of review

09/09/2016

### References



---

CAPELO, J., J. C. COSTA, M. LOUSÃ, S. FONTINHA, R. JARDIM, M. SEQUEIRA & S. RIVAS-MARTÍNEZ (2000). Vegetação da Madeira (Portugal): aproximação à tipologia fitossociológica. *Silva Lusitana* 7(2) : 257 - 279.

CAPELO, J., M. SEQUEIRA, R., JARDIM, S. MESQUITA & J. C. COSTA (2005) The vegetation of Madeira Island (Portugal). A brief overview and excursion guide. *Quercetea* 7: 105 -122

COSTA, J.C., C.NETO, C. AGUIAR, J. CAPELO, M.D. ESPÍRITO-SANTO, J. HONRADO, C. PINTO-GOMES, T. MONTEIRO-HENRIQUES, M. SEQUEIRA & M. LOUSÃ (2012) Vascular Plant Communities in Portugal (continental, Azores & Madeira) *Global Geobotany* 2: 1 -180.

COSTA, J.C., J. CAPELO, R. JARDIM, M. SEQUEIRA, D. ESPÍRITO-SANTO, M. LOUSÃ, S. FONTINHA, C. AGUIAR & S. RIVAS-MARTÍNEZ in CAPELO, J. (ed.) (2004) Catálogo sintaxonómico e florístico das comunidades vegetais da Madeira e Porto Santo. *Quercetea* 6: 61-186.

RIVAS-MARTÍNEZ, S., W. WILDPRET, M. DEL ARCO, O. RODRÍGUEZ, P.L. PÉREZ DE PAZ, A. GARCIA-GALLO, J.R. ACEBES, T.E. DÍAZ & F. FERNÁNDEZ-GONZÁLEZ (1993) - Las comunidades vegetales de la Isla de Tenerife (Islas Canarias). *Itinera Geobotanica* 7: 169-374.