

F8.2 Madeirean xerophytic scrub

Summary

This endemic scrub of succulent shrubs and small trees is confined to rocky lowland cliffs on Madeira, including both primary vegetation, degraded serial stages and transitions to halophytic scrub, heathland and forest. It is strongly threatened by urban development with most locations being very small and embedded in an urban or semi-rural landscape, and also by invasion of non-native grasses and cacti. The creation of miniature reserves and mitigation of impacts are essential.

Synthesis

The very large reduction in area (-85%) over a 50 year timespan due to urban expansion leads to the Red List category Endangered (EN) under criterion A1. The same category is assessed from the very restricted geographic distribution (both in extent and area of distribution) in combination with continuing negative trends and threats (criteria B1 and B2).

Overall Category & Criteria			
EU 28		EU 28+	
Red List Category	Red List Criteria	Red List Category	Red List Criteria
Endangered	A1, B1, B2	Endangered	A1, B1, B2

Sub-habitat types that may require further examination

Several varieties with a high risk of extinction may be distinguished. The *Euphorbia piscatoria* subtype is likely to be the less threatened subtype, as it develops from agricultural abandonment. All other subtypes however have a small area and occur relatively isolated. Especially the climax vegetation of the *Olea-Maytenus* subtype should be further examined, as it may reach the Critically Endangered (CR) category, since it is the most rare type and still under threat.

Habitat Type

Code and name

F8.2 Madeirean xerophytic scrub



Xerophytic scrub dominated by *Olea maderensis* and *Maytenus umbellata* on the southern slope of Madeira Island (Photo: Jorge Capelo).



Xerophytic scrub of *Euphorbia piscatoria*, *Echium nervosum* and *Globularia salicina* on the southern slope of Madeira Island (Photo: Jorge Capelo).

Habitat description

Xerophytic nano- to microphanerophytic communities, sclerophyllous, succulent (or having other kinds of morphological adaptations to drought) of the lower altitudes in Madeira island. These include: (1) communities dominated by paleomediterranean shrubs or small trees: *Olea*, *Maytenus*, *Chamaemeles*: with hard leathery leaves (*Mayteno-Oleion maderensis*) that stand for mature zonal vegetation of permanent character in thin cambisols of rocky steep cliffs in the infra to thermomediterranean (sometimes infra-thermotemperate in the north face) semi-arid to dry belts. In their upper altitude limit some of these communities (*Myrtus communis* with *Hypericum canariense*) may be the natural edge or first seral stage of the *Apollonias barbujana* thermomediterranean sub-humid forests (included in G2.3 type, *Visneo-Apollonion*); (2) Thick succulent stemmed *Euphorbia piscatoria* summer-deciduous communities that are seral stages of the former (i.e. i)), permanent communities or pioneer in rocky leptosols, for instance in low altitude abandoned fields; (3) inframediterranean/temperate sub-humid half-sclerophyllous tall shrub communities of the northern face, transitional from xerophytic to mesophytic heathlands (*Syderoxylon mirmulans* community: *Visneo-Apollonion barbujanae*); (4) chamaephytic communities of neomediterranean shrubs, having rolled, hairy, waxy or resinous leaves, or exhibiting leaflessness the most part of the year, that are seral stages of the zonal sclerophyllous types, pioneer or sometimes permanent in semiarid steep rocky cliffs (*Soncho-Artemision argenteae*); (5) xerophytic succulent low-scrub semi-halonitrophyllous under some influence of salt winds and nitrates from bird dropping deposition of *Calendula maderensis* (*Argyranthemum succulentum-Calendulion maderensis*).

The two later variants (iv) and v)) could be together separated as a subtype within the F8.2 type, but since they are found usually in mosaic with the other variants without regional or landscape separation, this is superfluous for habitat typology purposes. The main contacts of the F8.2 type are with *Grenovio-Aeonietea* succulent rock wall vegetation (*Sinapidendro-Aeonion glutinosi*, H3.3 Macaronesian inland cliffs). Where the semi-halonitrophyllous scrubs are not found in mosaic with other communities of H8.2, they can be considered as type H6.8a Mediterranean halo-nitrophilous scrubs.

Indicators of good quality:

In general, dominant plants and the bioindicator set should be identified at its maximum number as a measure of ecological integrity (see characteristic species, flora, vascular plants). As to the sclerophyllous or half-sclerophyllous variants (i and ii) that are successionaly replaced by the ii) or iv) variants by disturbance, the more elements of *Euphorbia piscatoria* community (*E. piscatoria*, *Echium nervosum* or *Globularia salicina*) or any of the iv) variant (*Carlina salicifolia*, *Artemisia argentea*, *Erysimum maderense*, *Genista tenera*, *Helichrysum monizii*, *Micromeria varia* subsp. *thymoides* and *Phagnalon lowei*), the more the sclerophyllous i) variant is formally close to collapse. Nevertheless, since this happens from natural or expected human-induced causes and the seral stages are themselves floristically valuable, some care should be taken in evaluating the whole of the mosaic of variants within the F8.2 type for conservation purposes. The same reasoning applies to the v) variant (indicators: *Argyranthemum pinnatifidum* subsp. *suculentum* and *Calendula maderensis*). Reliable indicators of degradation are the increase in dominance of tall-grass stages: *Hyparrhenia sinaica* (= *H. hirta* auct. mad.), *Cenchrus ciliaris*, *Dactylis glomerata* subsp. *hylodes* or any kind of disturbance-prone or nitrophyllous vegetation.

Note on delimitation of habitat type

We restrict the habitat concept to the xerophytic hard-leaved/succulent in low-altitude (infra-thermomediterranean) semi-arid to dry nano-microphanerophytic shrub communities (*Rhamno-Oleetea cerasiformis*) and also including xerophytic low-scrub in high sea cliffs under the moderate influence of salt winds and nitrates from sea bird droppings (semi-halonitrophyllous communities: *Pegano-Salsoletea*). Due to its transitional character between xerophytic high scrub (*Mayteno-Oleion*) and driest/hottest laurel forest (*Visneo-Apollonion*), the *Sideroxylon mirmulans* tall-scrub is also included in the type. Chamaephytic communities of salt-rich soil in sea-cliffs under strong influence of salt spray close to wave breaks are not included (*Helichrysis obconico-devium*) and belong to habitat type B3.1-3c - Macaronesian rocky sea cliffs

and shores. Also, chamaephytic vegetation dominated by succulent crassulaceae (*Aeonium* sp. pl.) is excluded and considered in H3.3.- Macaronesian inland cliffs.

Characteristic species:

Flora

Vascular plants: *Olea maderensis* (Lowe) Rivas Mart. & Del Arco (dom.), *Rubia fruticosa* subsp. *fruticosa*, *Asparagus scoparius*, *Bupleurum salicifolium* subsp. *salicifolium*, *Ephedra fragilis* var. *dissoluta*, *Erysimum bicolor*, *Globularia salicina* (dom.), *Hypericum canariense* var. *floribundum* (dom.), *Jasminum odoratissimum*, *Myrtus communis*, *Tamus edulis*, *Teucrium heterophyllum*, *Asparagus umbellatus* subsp. *lowei*, *Chamaemeles coriacea**, *Convolvulus massoni*, *Crambe fruticosa*, *Echium nervosum* (dom.), *Echium portsanctensis*, *Euphorbia piscatoria* (dom.), *Sideroxylon mirmulans* (dom.), *Helichrysum melaleucum*, *Jasminum azoricum*, *Maytenus umbellata* (dom.), *Plantago maderensis*, *Prasium medium*, *Scilla madeirensis*, *Sideritis candicans* var. *multiflora*, *Carlina salicifolia*, *Artemisia argentea*, *Cheirolophus massonianus*, *Erysimum arbuscula*, *Erysimum maderense*, *Genista tenera*, *Helichrysum monizii*, *Lotus argyroides*, *Lotus macranthus*, *Micromeria varia* subsp. *thymoides* var. *thymoides*, *Phagnalon lowei*, *Atriplex glauca* subsp. *ifnensis*, *Atriplex halimus*, *Chenoleoides tomentosa*, *Launea arborescens*, *Lycium intricatum*, *Lavandula pinnata*, *Schizogyne sericea*, *Argyranthemum pinnatifidum* subsp. *suculentum*, *Calendula maderensis*.

* this genus is endemic to Madeira.

Classification

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

EUNIS:

F8.2 Xerophytic scrub of Madeira

EuroVegChecklist:

Mayteno umbellatae-Oleion maderensis (whole)

Soncho ustulati-Artemision argenteae (whole)

Argyranthemum suculentum-Calendulion maderensis (whole)

Visneo mocanerae-Apollonion barbujanae (a small part: *Helichryso melaleuci-Sideroxyletum mirmulans*)

Annex 1:

-

Emerald:

-

MAES-2:

Heathland and shrub

IUCN:

3.5. Subtropical/Tropical Dry Shrubland

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

Yes

Regions

Macaronesian

Justification

The habitat type is restricted to rock walls in the low-altitude southern face of Madeira Island (with few impoverished location in the northern face). It is dominated by endemic shrubs: *Olea maderensis*, *Maytenus umbellata*, *Echium nervosum*, *Euphorbia piscatoria*. And even includes an endemic genus: *Chamaemeles* Lindl.

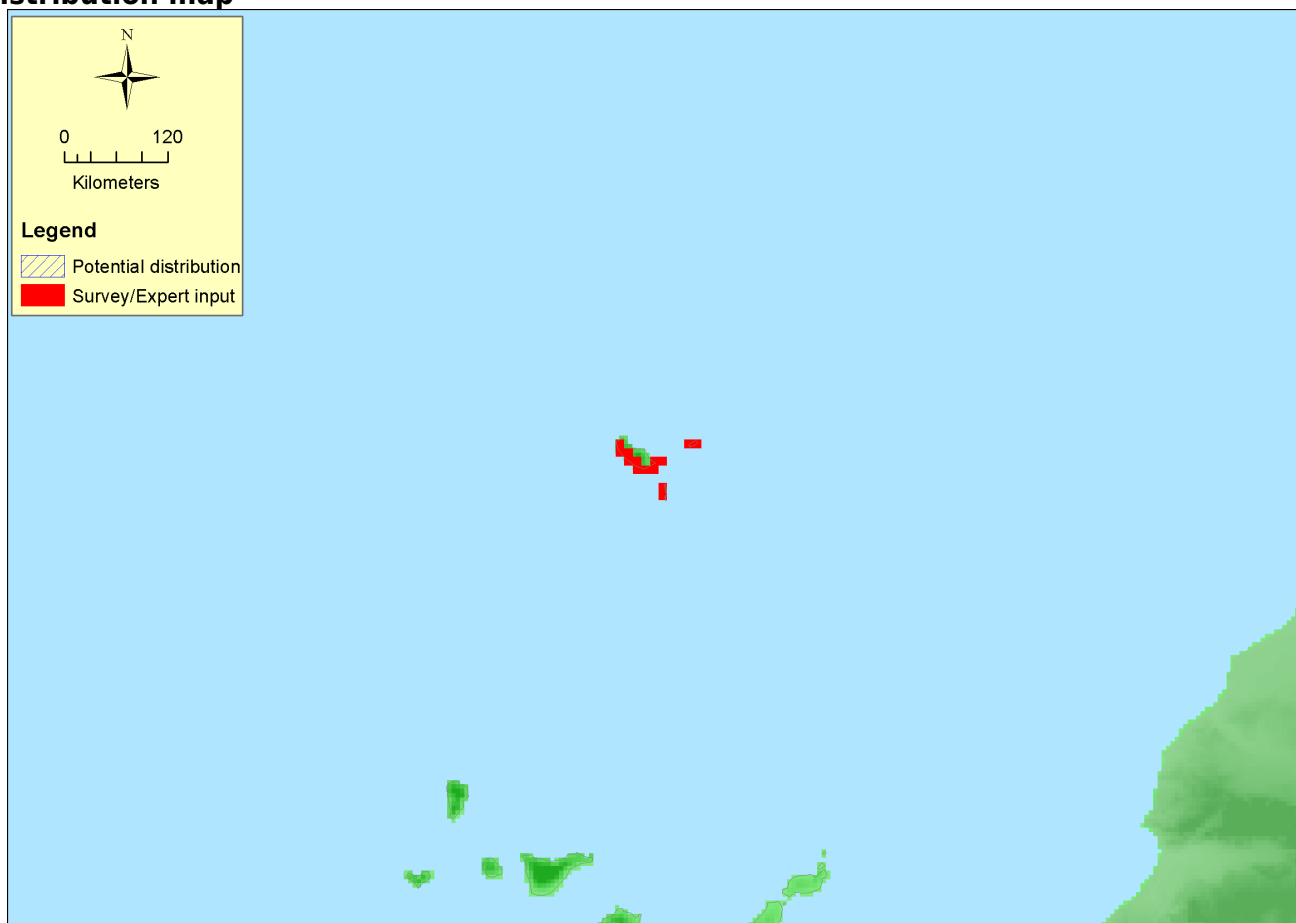
Geographic occurrence and trends

EU 28	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
Portugal	Madeira: Present	2 Km ²	Decreasing	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	4550 Km ²	14	2 Km ²	
EU 28+	4550 Km ²	14	2 Km ²	

Distribution map



The map provides the complete distribution of the habitat. Data sources: LIT.

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

The whole of the habitat area is within the EU28

Trends in quantity

Although one of the variants of the habitat, probably has somewhat recovered in the last two decades due to abandonment of traditional agricultures (the *Euphorbia piscatoria*-dominated variant ii), the general trend is estimated to be of a severe reduction in the 50 year time span. The assessor's estimate is of - 85% area reduction, in this period, due to a great urban expansion since 1974 taking place in the lower altitudes of the southern face of the island (which is the optimum area of the habitat). Historical reduction was not reported, but assessors by comparing the potential area (Natural Potential Vegetation Map) and the actual area and agricultural historical records estimate that reduction might have been greater than 50%. Future trends is that the rate of area reduction is much lower due to conservation policies, but as conflicts with urban expansion still are expected, the absolute area of habitat might decrease all the same.

- Average current trend in quantity (extent)

EU 28: Decreasing

EU 28+: Decreasing

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

Yes

Justification

The habitat has a small (EEO = 2.380 Km²) range (AOO = 8 (eight) 10 x 10 gridsquqres) and has suffered a great reduction in the last 50 years (85%).

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

Yes

Justification

The habitat has a small (EEO = 2.380 Km²) range (AOO = 8 (eight) 10 x 10 gridsquqres).

Trends in quality

There is no territorial information to evaluate any of the parameters to estimate quality reduction. Assessors estimate a decrease as average current trend.

- Average current trend in quality

EU 28: Decreasing

EU 28+: Decreasing

Pressures and threats

The main threat is urban expansion, due to buildings and infrastructure associated to transport. Further, stabilization of rock walls and steep slopes by engineering procedures often leads to degradation or collapse of sites with the habitat. Finally, the invasion of alien species is also a threat, like reeds (*Arundo donax*) and exotic cactusses (*Opuntia tuna*).

List of pressures and threats

Transportation and service corridors

Roads, motorways

Bridge, viaduct

Tunnel

Urbanisation, residential and commercial development

Continuous urbanisation

Invasive, other problematic species and genes

Invasive non-native species

Conservation and management

Restoration of Madeirean xerophytic scrub should follow the following principles:

1. Establishment of protected areas (micro-reserves) with strict protection of habitat sites and component species as many small locations are within urban or semi-urban context.
2. Removal of pressures or any kind of human-induced disturbance.
3. Removal of alien invaders
4. Allow urban development to take such micro-reserves in account with a buffer around them.

List of conservation and management needs

Measures related to forests and wooded habitats

Restoring/Improving forest habitats

Measures related to spatial planning

Establish protected areas/sites

Legal protection of habitats and species

Manage landscape features

Conservation status

No related Annex I types

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

Although some of the characteristic species may establish relatively quickly, it is assessed that recovery to a species-rich, natural vegetation takes relatively long.

Effort required

10 years	20 years	50+ years
Naturally	Naturally	Naturally

Red List Assessment

Criterion A: Reduction in quantity

Criterion A	A1	A2a	A2b	A3
EU 28	-85 %	slight decrease %	unknown %	>50% %
EU 28+	-85 %	slight decrease %	unknown %	>50% %

Over a 50-year time span a reduction in its area is estimated of -85% due to recent urban development. Historical reduction is estimated to be large as well, due to urban and agricultural land use and, surely, larger than 50% of the original area. Future trends are expected to be of lower reduction rates, as protection measures were issued, although conflicts with urban development objectives are still to be expected. A slight further decrease of the already critical area is therefore not unrealistic. The figures lead to the category Endangered (EN) for A1 and Vulnerable (VU) for A3.

Criterion B: Restricted geographic distribution

Criterion B	B1				B2				B3
	EOO	a	b	c	AOO	a	b	c	
EU 28	4550 Km ²	Yes	Yes		14	No	No		
EU 28+	4550 Km ²	Yes	Yes		14	No	No		

The habitat range is small (EOO=4550 Km²) and the same goes for the distribution (AOO = 14 grid cells). The number of 10 x 10 km locations is likely not to have declined, but a large reduction in area (inside the grid cells) has occurred. Some reduction due to urbanistic pressure is still to be expected in spite of protective measures, so criteria B1a and b apply. These figures lead to the category Endangered (EN) for B1 and B2.

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	30 %	50 %	unknown %	unknown %	unknown %	unknown %
EU 28+	30 %	50 %	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%

No territorial data were available, but based on expert knowledge it is estimated that a reduction in quality occurred over the last 50 years in 30% of the area with moderate severity (50%), mainly caused by invasion of non-native plant species. This assessments just leads to the category Near Threatened (NT).

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	EN	LC	DD	VU	EN	EN	DD	NT	DD	DD	DD	DD	DD	DD	DD	DD	DD
EU28+	EN	LC	DD	VU	EN	EN	DD	NT	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	A1, B1, B2	Endangered	A1, B1, B2

Confidence in the assessment

Medium (evenly split between quantitative data/literature and uncertain data sources and assured expert knowledge)

Assessors

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Date of assessment

19/10/2015

Date of review

09/09/2016

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