

## F5.1 Mediterranean maquis and arborescent matorral

### Summary

This habitat includes evergreen sclerophyllous or lauriphylloous maquis vegetation with a more or less closed canopy structure, but also the low, sparse, garrigue-like siliceous scrub of the western Mediterranean and low matorral with a tree cover and usually tall and thick evergreen understorey occurring through the Mediterranean zone. Such vegetation occurs on a wide variety of substrates, with diverse associated floras, and may represent pre-forest communities, replacement stages of the climax forests, or permanent communities on xeric sites. Natural succession, intensive grazing, forest clearance and fires are major threats. Controlling such processes and interventions aid conservation.

### Synthesis

The habitat qualifies for the Least Concern (LC) category because it has an extensive distribution across the Mediterranean biogeographical zones, the reduction in quantity over the past 50 years has been very small (in fact in most areas the habitat area has been stable), and the decline in quality over the same period was slight to moderate affecting only a small part (9%) of the extent.

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

Several geographically differentiated sub-types may be distinguished. Such subtypes should be monitored in relation to the neighbouring vegetation communities in the succession line, because this habitat includes maquis and arborescent matorral that may represent pre-forest communities, replacement stages of the "climax" forests, or permanent communities on xeric sites.

### Habitat Type

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#### Code and name

F5.1 Mediterranean maquis and arborescent matorral



Dense evergreen tall maquis vegetation dominated by *Quercus coccifera*, *Pistacia lentiscus* and *Phillyrea latifolia* in the island of Corfu, Ionian islands (Photo: Panayotis Dimopoulos).



A typical display of maquis dense vegetation (impenetrable scrublands) with *Pistacia lentiscus*, *Olea europaea*, *Quercus coccifera* and *Calicotome villosa* in Nafpaktos, south central Greece (Photo: F. Xystrakis).

## Habitat description

This habitat includes the evergreen sclerophyllous or lauriphylloous shrub vegetation with a more or less closed canopy structure (maquis), the low, sparse, garrigue-like silicicolous maquis of western Mediterranean, as well as the communities of low arborescent cover and with a usually thick, high evergreen shrub stratum, occurring in the Mediterranean biogeographical zone. Maquis and arborescent matorral may represent pre-forest communities, replacement stages of the climax forests, or permanent communities on xeric sites. High maquis includes scrub of *Arbutus* spp., *Erica* spp., *Juniperus* spp., *Phillyrea* spp. and low maquis includes communities of *Cistus* spp., *Erica* spp., *Genista* spp., *Lavandula* spp. Primary matorral occurs on ecologically marginal sites, but more often this habitat is derived from degraded broad-leaved evergreen, thermophilous deciduous or conifer forests. *Juniperus* spp., *Ziziphus* spp., *Laurus nobilis* and *Quercus coccifera* may codominate. The habitat includes a broad variety of plant communities and so, it does not exhibit any specific ecological preference. It mostly occurs in the thermo- to meso-Mediterranean belts but it extends from the intermediate between tropical and Mediterranean zones (scrub steppes of the arid Iberian, North Africa, Anatolia and central Cyprus) to the supra-Mediterranean zone (*Cistus ladanifer* shrublands of the Iberian peninsula and southern France). The habitat does not show any relationship with one specific substrate and it is found on acid (e.g. *Ericion arboreae*; *Arbuto unedo-Laurion nobilis*), decalcified (e.g. *Cistus laurifolius* maquis) and alkaline soils. Grazing and fire are two of the most influential factors shaping the habitat's physiognomy, acting at varying and usually contradictory ways. *Cistus monspeliensis* maquis can be favoured from fire events and may dominate the landscape after fires. On the other hand, fire in *Juniperus* spp. arborescent matorrals can be a big threat to the habitat due to the low resistance to and poor recovery from fire of *Juniperus* species. With increasing summer aridity and human pressure, maquis resembles to garrigues as they become low and sparse. Moreover low, garrigues-like maquis are rather frequent in fire-prone regions. This habitat, besides the primary, edaphic- or climatic-controlled stands at marginal sites, has a strong plagioclimax character and so, its occurrence and quality mainly depends on the occurrence of low to intermediate disturbances at an acceptable periodicity.

Indicators of quality:

- Dense horizontal and vertical vegetation structure
- No indication of overgrazing
- Absence of active secondary succession towards forest ecosystems (absence of trees)
- Absence of grass encroachment
- Species richness of the stands
- Absence of invasive species
- Absence or low cover of ruderal species

Low levels of soil compactness, well developed Ah soil horizon and are good indicators of absence of over grazing that can result to degradation towards garrigues. On the other hand, the level of tree and grass encroachment and, generally, presence and abundance of a given set of typical species or functional traits (i.e. morphological, physiological and life history characteristics) can be used as proxy indicators of biodiversity levels and succession stage. Absence of invasive and/or ruderal taxa should be also considered as indication of good habitat quality.

Characteristic species:

*Acacia albida*, *Arbutus unedo*, *Calluna vulgaris*, *Ceratonia siliqua*, *Cistus albidus*, *C. crispus*, *C. incanus*, *C. ladanifer*, *C. laurifolius*, *C. monspeliensis*, *C. populifolius*, *C. psilosepalus*, *C. salvifolius*, *Cupressus sempervirens*, *Erica arborea*, *E. cinerea*, *E. lusitanica*, *E. scoparia*, *J. oxycedrus*, *J. phoenicea*, *J. thurifera*, *Laurus nobilis*, *Lavandula stoechas* subsp. *luisieri*, *L. stoechas* subsp. *pedemontana*, *L. stoechas* subsp. *stoechas*, *Myrtus communis*, *Olea europaea* subsp. *cerasiformis*, *O. europaea* var. *sylvestris*, *Phillyrea angustifolia*, *P. latifolia*, *Pistacia lentiscus*, *Quercus coccifera*, *Q. faginea*, *Q. ilex*, *Q. pyrenaica*, *Q.*

*rotundifolia*, *Q. suber*, *Rhamnus alaternus*, *Tetraclinis articulata*, *Viburnum tinus*, *Zelkova abelicea*, *Ziziphus lotus* and *Z. spina-christi*.

## Classification

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

EUNIS:

F5.1 Arborescent matorral

F5.2 Maquis

EuroVegChecklist:

*Acero sempervirentis-Cupression sempervirentis* Barbero et Quézel ex Quézel et al. 1993

*Arbuto andrachnae-Quercion cocciferae* Barbero et Quézel 1979

*Arbuto unedonis-Laurion nobilis* Rivas-Mart., Fernández-González et Lodi 1999

*Asparago albi-Rhamnion oleoidis* Rivas Goday ex Rivas-Mart. 1975

*Ceratonio-Pistacion lentisci* Zohary ex Zohary et Orshan 1959

*Ericion arboreae* (Rivas-Mart. ex Rivas-Mart. et al. 1986) Rivas-Mart. 1987

*Erico-Quercion ilicis* S. Brullo et al. 1977

*Juniperion turbinatae* Rivas-Mart. 1975 corr. 1987

*Oleo-Ceratonion siliquae* Br.-Bl. ex Guinochet et Drouineau 1944

*Periplocion angustifoliae* Rivas-Mart. 1975

*Pistacio terebinthi-Rhamnion alaterni* Barbero et Quézel ex Quézel et al. 1992

*Quercion alnifoliae* Barbero & Quézel 1979

*Quercion broteroii* Br.-Bl. et al. 1956 corr. Rivas-Mart. 1972

*Quercion calliprini* Zohary ex Quézel et al. 1992

*Quercion ilicis* Br.-Bl. ex Molinier 1934

*Oleo sylvestris-Quercion rotundifoliae* Barbero, Quézel et Rivas-Mart. in Rivas-Mart. et al. 1986 nom. invers. propos.

*Rhamno lycioidis-Quercion cocciferae* Rivas Goday ex Rivas-Mart. 1975

Annex I:

5210 Arborescent matorral with *Juniperus* spp.

5230 Arborescent matorral with *Laurus nobilis*

5310 *Laurus nobilis* thickets

5330 Thermo-Mediterranean and pre-desert scrub

9390 \*Scrub & low forest vegetation with *Quercus alnifolia*

Emerald:

F5.13 Juniper matorral

F5.18 Laurus nobilis matorral

F5.516 Laurus thickets

MAES:

Heathland and shrub

IUCN:

3.8 Mediterranean-type Shrubby Vegetation

Other relationships:

5340 a Greek habitat type which includes maquis, garrigues and similar vegetation other than phrygana and pseudomaquis

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

Yes

Regions

Mediterranean

Justification

The evergreen sclerophyllous or lauriphylloous scrubs included in this habitat represent the typical and most widespread vegetation type of the Mediterranean basin; different subtypes of this habitat either with a more or less closed canopy structure (maquis) or low, sparse, garrigue-like silicicolous maquis of western Mediterranean, or low arborescent cover and with a usually thick, high evergreen shrub stratum, occur exclusively in the Mediterranean zone.

**Geographic occurrence and trends**

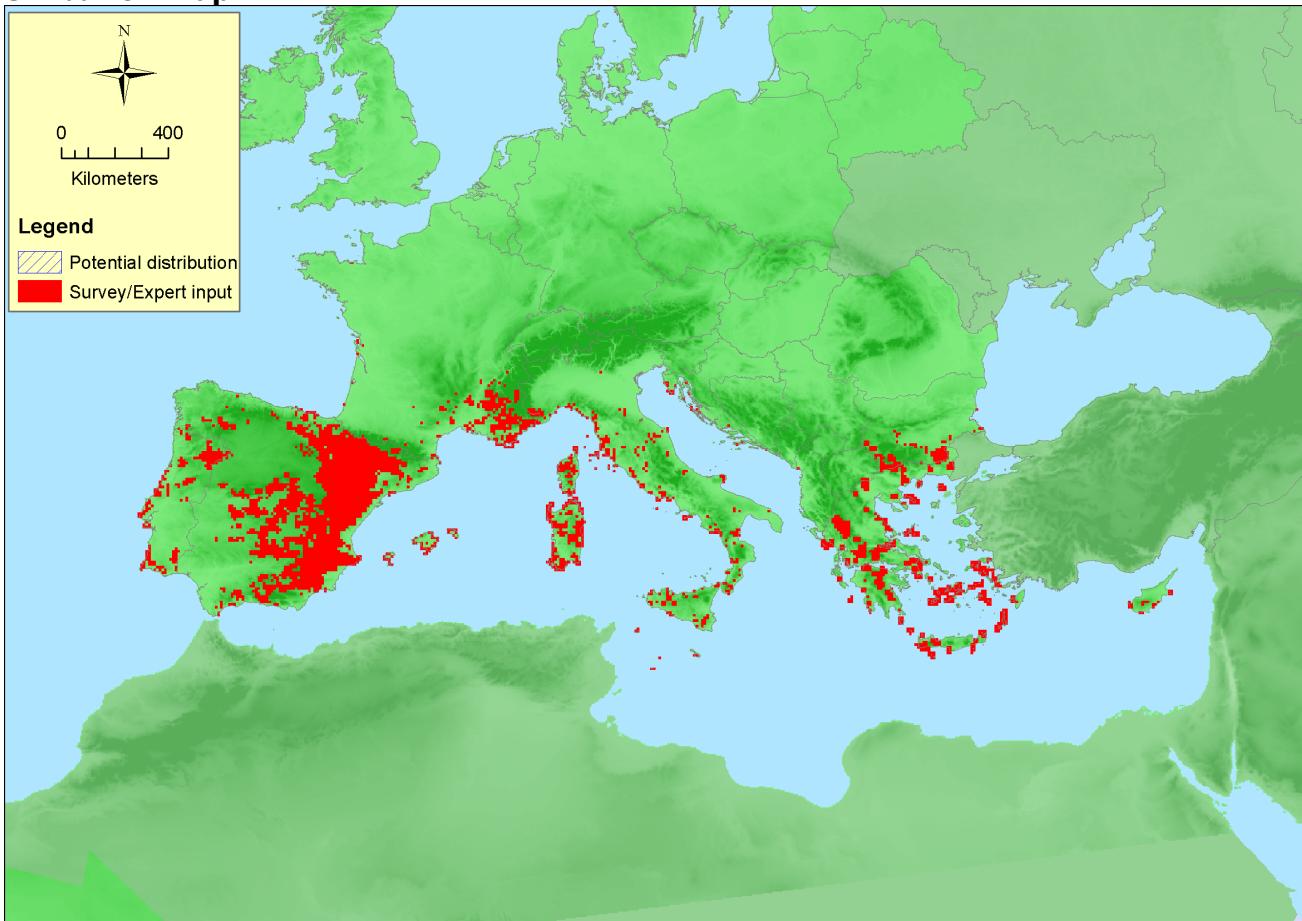
EU 28	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
Bulgaria	Present	184 Km <sup>2</sup>	Increasing	Stable
Croatia	Present	1208 Km <sup>2</sup>	Increasing	Stable
Cyprus	Present	56 Km <sup>2</sup>	Stable	Increasing
France	Corsica: Present France mainland: Present	218 Km <sup>2</sup>	Stable	Stable
Greece	Crete: Present East Aegean: Present Greece (mainland and other islands): Present	643 Km <sup>2</sup>	Stable	Increasing
Italy	Italy mainland: Present Sardinia: Present Sicily: Present	2205 Km <sup>2</sup>	Stable	Unknown
Malta	Present	Unknown Km <sup>2</sup>	Unknown	Unknown
Portugal	Portugal mainland: Present	19 Km <sup>2</sup>	Decreasing	Unknown
Spain	Balearic Islands: Present Spain mainland: Present	4990 Km <sup>2</sup>	Stable	Stable

EU 28 +	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
Albania	Present	Unknown Km <sup>2</sup>	Unknown	Unknown
Bosnia and Herzegovina	Present	20 Km <sup>2</sup>	Decreasing	Decreasing
Former Yugoslavian Republic of Macedonia (FYROM)	Present	Unknown Km <sup>2</sup>	Unknown	Unknown
Montenegro	Present	Unknown Km <sup>2</sup>	Unknown	Unknown
Serbia	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	3934300 Km <sup>2</sup>	3553	9523 Km <sup>2</sup>	Based on the existing data provided from EU Member States. This number is partially representing the current actual total area.
EU 28+	3934300 Km <sup>2</sup>	3575	>9523 Km <sup>2</sup>	No quantitative data exist for the EU 28+ countries. We have only the current estimated area in Bosnia & Herzegovina

### Distribution map



The map is rather complete for EU28, but has data gaps outside the European Union, like in the coastal regions of the Balkan countries. Data sources: Art17, EVA.

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

About 90% of its total Mediterranean distribution area lies within the EU 28.

### **Trends in quantity**

Out of the nine countries that have provided territorial data, 5 countries (Spain, France, Italy, Greece, Cyprus) report a stable quantity, 2 countries (Bosnia/Herzegovina and Portugal) report a slight decrease, and 2 countries (Bulgaria, Croatia) report a slight increase to the extent of the habitat.

- Average current trend in quantity (extent)

EU 28: Stable

EU 28+: Unknown

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

No

#### *Justification*

The habitat occurs most often in extensive stands and the various vegetation types of the maquis and the arborescent matorral are typical and the most widespread vegetation occurring in the Mediterranean basin.

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

No

#### *Justification*

The habitat is distributed across the entire Mediterranean biogeographical zone (including not only EU 28 and EU 28+ countries) but also in Turkey, Northern Africa, etc.

### **Trends in quality**

Of the 9 countries for which territorial data are available, only few quantitative data have been provided on trends in quality. The recent trend in quality is given mostly as experts opinion, either as stable (5 of the 9 countries) or increasing (2 of the 9 countries) to decreasing (1 of the 9 countries) and unknown (1 of the 9 countries). The European trend has been calculated although with many data gaps. Overall its is assessed that there is a stable to positive trend (increasing) with slight severity of degradation in the past.

- Average current trend in quality

EU 28: Stable

EU 28+: Unknown

### **Pressures and threats**

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The main pressures, which might become threats in the future, affecting the quality (structural elements) of the habitat are related to quality indicators of the habitat: intensive grazing (overgrazing can result to degradation towards garrigues), forest clearance and fires, as well as the biocoenotic evolution and succession (absence of active secondary succession towards forest ecosystems is also a good quality indicator for the habitat). The intensity of the pressures vary throughout the Mediterranean distribution area of the habitat.

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

#### **Sylviculture, forestry**

Forest and Plantation management & use

Forestry clearance

Removal of forest undergrowth

Grazing in forests/ woodland

## **Transportation and service corridors**

Roads, paths and railroads

## **Natural System modifications**

Fire and fire suppression

Burning down

## **Natural biotic and abiotic processes (without catastrophes)**

Biocenotic evolution, succession

## **Conservation and management**

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In most cases no management measures are needed or (to be accurate) is possible to be implemented. However, especially when the habitat occurs within a protected area of the Natura 2000 network or under another designated protection status, it would be possible to monitor and control the grazing intensity, as well as the cutting of shrubs and low trees (for fire wood) and in some cases the forest clearance. The level of tree and grass penetration and, generally, the presence and abundance of a given set of typical species or functional traits (i.e. morphological, physiological and life history characteristics) that can be used as proxy indicators of biodiversity levels and succession stage could be set as conservation objectives and certain measures to restore or improve these tall scrub habitats could be designed and implemented.

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

### **Measures related to forests and wooded habitats**

Restoring/Improving forest habitats

Adapt forest management

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

Manage landscape features

## **Conservation status**

Only for the Mediterranean Biogeographical region where the herein defined habitat F 5.1 (related partly or fully with the Annex I of the Dir. 92/43/EC habitat types (5230, 6310) occurs.

5230 U1

6310 U2

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

The habitat can restore naturally without any human intervention, even in short time periods.

### **Effort required**

20 years
Naturally

## **Red List Assessment**

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### **Criterion A: Reduction in quantity**

Criterion A	A1	A2a	A2b	A3
EU 28	-4.2 %	unknown %	unknown %	unknown %
EU 28+	-4.2 %	unknown %	unknown %	unknown %

The estimation of the decline in quantity is based on the territorial data provided by 7 of the 8 EU28 countries and shows a slight reduction in quantity the last 50 years. From the EU28+ countries, quantitative data were provided only by Bosnia & Herzegovina.

#### 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	Unknown	Unknown	>50	No	Unknown	Unknown	Unknown
EU 28+	>50000 Km <sup>2</sup>	Unknown	Unknown	Unknown	>50	Unknown	Unknown	Unknown	Unknown

The EOO, AOO and number of locations are all much higher than the thresholds under criterion B.

#### 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	8.9 %	25 %	unknown %	unknown %	unknown %	unknown %
EU 28+	8.9 %	25 %	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%

Both biotic and abiotic quality of the habitat have not substantially reduced the last 50 years. Decline in quality has been summarized on the basis of the national experts assessments. From the calculations of the trend in quality, it is evident that the last 50 years only a slight decline in quality (extent of degradation equals 8.9% with severity 25%) has occurred.

#### 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.

## 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	DD	DD	DD	LC	LC	LC	LC	DD	DD	DD	DD	DD	DD	DD	DD	DD
EU28+	LC	DD	DD	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

High (mainly based on quantitative data sources and/or scientific literature)

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## Date of assessment

28/12/2015

## Date of review

11/02/2016

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