

G3.9b Mediterranean Cupressaceae woodland

Summary

This habitat combines conifer woodland dominated by *Cupressus sempervirens* and/or various *Juniperus* species, and very locally *Tetraclinis articulata*, on mountainous rocky slopes, in a wide range of altitudes, slopes and expositions at scattered localities through the Mediterranean region. There is usually a moderately open canopy often with thermophilous coastal pines or some Mediterranean broadleaves, and a diversity of associated floras reflecting the terrain and local climate. Firewood collection and charcoal production have much affected this habitat but abandonment offers opportunities for its spread. Forest clearance and intensive grazing and browsing remain as threats to existence or regeneration. Competition with broad-leaved deciduous species also contributes to structural and functional changes. Conservation should focus on encouraging natural regeneration.

Synthesis

Although the quantitative data for quality are lacking for almost half of the countries where the habitat is distributed, the Red List Criteria qualify for a Least Concern Status. This assessment is due to the extensive distribution in across the Mediterranean, the reduction in area has been small (mostly stable or slight reduction) and the quality decline occurs over small proportion of the total area.

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

A very variable habitat, which combines conifer woods dominated by *Cupressus sempervirens* and/or various juniper species, including *Juniperus excelsa*, *J. drupacea*, *J. foetidissima* and *J. thurifera*. The few stands of *Juniperus phoenicea* and *J. oxycedrus* that qualify as woodlands are also included under this unit. The main emphasis for further research and monitoring of the trends in quality and quantity should be given to the woodlands dominated by *Juniperus excelsa*, *J. drupacea* and *J. thurifera*. Attention should also be paid to the lowlands of the distribution range of *Cupressus sempervirens* woodlands in the island of Crete.

Habitat Type

Code and name

G3.9b Mediterranean Cupressaceae woodland



Cupressus sempervirens stands in Lefka Ori, Crete, Greece (Photo: F. Xystrakis).



Juniperus thurifera stands belonging to the association Juniperetum hemisphaericothuriferae, Soria area in Central Spain (Photo: A. Arzac).

Habitat description

This habitat combines conifer woods dominated by *Cupressus sempervirens* and/or various juniper species, including *Juniperus excelsa*, *J. drupacea*, *J. foetidissima* and *J. thurifera*. The few stands of *Juniperus phoenicea* and *J. oxycedrus* that qualify as woodlands are also attributed in this unit. The following sub-types can be distinguished:

- Natural *Cupressus sempervirens*-dominated woodlands are found in South Anatolia, Cyprus, Syria, Palestine, Lebanon, Cyrenaica and the islands of southeast Greece, while isolated occurrences are also reported in Iran, Tunisia and Morocco. They form moderately open (cover ca. 60%) to open canopies often with thermophilous coastal pines (*Pinus halepensis*, *P. brutia*) or forming mixed stands with *Acer sempervirens* and *Quercus coccifera*. The woodlands are found on mountainous rocky slopes, in a wide range of altitudes, slopes and expositions. *C. sempervirens* form stands from the thermo- to the upper levels of the supra-Mediterranean zones and exhibits no clear preference for geological substrate, growing on shallow and dry to deep and moist soils.
- *Juniperus excelsa* woodlands are distributed throughout the eastern Mediterranean, from the southern and central Balkans (Greece, Albania, Bulgaria, FYROM), through Anatolia (regionally widespread and continuously distributed along the Taurus chain in southern Anatolia), to Ukraine and Crimea, central and southwest Asia (Turkmenistan, Cyprus, Iran, Lebanon, Syria), Caucasus (Armenia, Azerbaijan, Georgia) and east Africa (Quézel and Médail 2003). The species does not occur in regions with annual precipitation below 500 mm. In the Balkan peninsula, the altitudinal range of distribution is from 100 to 1300 m, yet in Turkey it goes up to 2200 m. It occurs in xerothermic sites, most frequently on limestone, diabase or serpentine, and often forms rather small, almost pure associations.
- *Juniperus foetidissima* woodlands are found in mountainous areas of the eastern Mediterranean region, mainly in the central and south Balkans (Albania, FYROM, Greece), Cyprus, Lebanon, Syria, Asiatic Turkey (rare or absent on the interior plateau), SE Caucasus to the coast of the Caspian Sea in Azerbaijan, along the coast of the Black Sea near Novorossiysk and in the Crimea (Farjon 1992). The *Juniperus excelsa* and *J. foetidissima* woodlands exhibit growth plasticity and can adapt to the soil dryness of the mountainous rocky slopes, forming the human-induced tree limits. They mainly occur on limestones in the meso- to upper supra-Mediterranean zone. Their canopy is moderately open (cover ca 60%) to open (cover <50%). Deciduous elements in the canopy are not uncommon, as for example *Fraxinus ornus*, *Carpinus orientalis* and *Quercus pubescens*, while at the higher altitudes the junipers are often associated with *Astracantha cretica*, *Daphne oleoides* and *Stipa pennata*.
- *Juniperus drupacea* woodlands are distributed in the Mediterranean, where they occur in Syria, Lebanon, Israel, Southern Turkey and two mountain locations in Greece (the species just reaches southeastern Europe). In the south Peloponnese mountains in Greece (Parnon and Taigetos), they occupy somewhat extended areas, but in general these woodlands are more widespread outside Europe in Turkey and the Middle East. Within this distribution range, *J. drupacea* forms mixed montane conifer forests with *Abies cilicica*, *A. cephalonica*, *Pinus brutia*, *P. nigra*, *Cedrus libani*, *Juniperus excelsa*, *J. foetidissima*, *J. oxycedrus*, *Quercus coccifera*, *Q.*

ilex and sometimes with *Fagus orientalis*. Much of its habitat has been modified into maquis vegetation. It grows on shallow, rocky soils, usually on calcareous or granite rocks at altitudes of between 600-1800 m and occurs in small groups or as solitary trees mixed with other conifer species. • *Juniperus thurifera* woodlands are scattered throughout the western Mediterranean basin and are relicts from the Tertiary distribution of the species pattern, a now disjunct spread occurring from Algeria and Morocco over the Iberian Peninsula and the Pyrenees to the French and Italian Alps and to Corsica. In general, these woodlands occur in a wide ecological amplitude, forming open stands from an altitude of 140m in Spain to more than 3000m in Mt. Atlas, Morocco. More specifically, and in contrast to the situation in Europe and Algeria, where *J. thurifera* occurs from 200 to 1800m, the Moroccan stands are associated with sub-humid cold winter bioclimates at the tree line, mainly between elevations of 1800 and 3150m. In Algeria, thuriferous juniper is limited to the Aurès mountains with a number of scattered and often very large trees that are probably the remains of formerly more extensive stands. The *Juniperus thurifera* woodlands are found on various substrates, slopes and inclinations of the supra-Mediterranean zone. The juniper is often associated with *Pinus nigra* subsp. *nigra*, *Quercus pubescens*, *Q. ilex* and other Juniper species. • Woodlands of *Tetraclinis articulata* are restricted to the dry coastal region of Cartagena in south-east Spain (regarding Europe), where these occur as scattered stands with a typical maquis understorey; in North Africa these woodlands are widespread in lowland areas of Morocco and Algeria. Since the canopy of all *Cupressaceae* woodlands is open, the presence of typical woodland species in the ground-flora is expected to be relatively limited, while, on the other hand, perennial steppe species are expected to dominate

Indicators of quality:

- No forest exploitations (if applicable, mainly azonal types with high nature value)
- Natural composition of canopy
- Structural diversity/ complexity with (semi)natural age structure or completeness of layers
- Typical flora and fauna composition
- Presence of old trees and a variety of dead wood (lying or standing) and the associated flora, fauna and fungi
- Presence of natural disturbance such as treefall openings with natural regeneration
- Long historical continuity (ancient woodland) with high species diversity
- Survival of larger stands of forest without anthropogenic fragmentation and isolation (to support fauna which need large undisturbed forests)
- Absence of non-native species in all layers (flora & fauna)
- No man-induced very high population levels of ungulates
- Absence of i) soil trampling signs, ii) deformation of woody species due to over-browsing, iii) logging, iv) fire signs, v) ruderal taxa.

Characteristic species:

Juniperus thurifera woodlands: *Hormathophylla spinosa*, *Berberis hispanica*, *B. vulgaris* ssp. *cantabrica*, *Bupleurum fruticosum* subsp. *spinosa*, *Daphne laureola*, *Ephedra major*, *Juniperus communis* subsp. *hemisphaerica*, *J. Juniperus communis* subsp. *nana*, *J. sabina*, *Pinus sylvestris*, *P. nigra* subsp. *salzmannii*, *Prunus prostrata*, *Rhamnus alpinus*, *Viburnum lantana*;

Cupressus sempervirens woodlands: *Acer sempervirens*, *Asperula rigida*, *Centaurea raphanina*, *Crepis fraasii*, *Cupressus sempervirens*, *Cylamen creticum*, *Erica arborea*, *Lamyropsis cynaroides*, *Luzula nodulosa*, *Pistacia lentiscus*, *Prasium majus*, *Quercus coccifera*, *Q. Ilex*, *Ruscus aculeatus*, *Teucrium microphyllum*;

Juniperus drupacea woodlands: *Abies cephalonica*, *Galium peloponnesiacum*, *Juniperus drupacea*, *Iris unguicularis*, *Phillyrea latifolia*, *Luzula nodulosa*, *Digitalis ferruginea* ;

Juniperus excelsa & *J. foetidissima* woodlands: *Juniperus excelsa*, *J. foetidissima*, *Astracantha cretica*,

Berteroa obliqua, *Melica ciliata*, *Festuca jeanpertia*, *Juniperus oxycedrus*, *Malcolmia graeca* subsp. *bicolor*, *Teucrium chamaedrys* subsp. *chamaedrys*, *Pterocephalus perennis*, *Scutellaria rupestris* subsp. *parnassica*, *Ajuga orientalis*, *Stipa pulcherrima*, *Achillea fraasii*, *Morina persica*, *Minuartia hamata*, *Silene congesta*;

Tetraclinis articulata woodlands: *Peroploca angustifolia*, *Euphorbia dendroides*, *Juniperus phoenicea* subsp. *turbinata*, *Calicotome infesta*, *Ephedra fragilis*, *Retama raetam* subsp. *gussoniei*, *Pistacia lentiscus*, *Teucrium fruticans*, *Asparagus acutifolius*, *Phillyrea latifolia*, *Ruta chalapensis*, *Erica multiflora*, *Asphodelus ramosus*, *Hyparrhenia hirta*.

Classification

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

EUNIS:

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EuroVegChecklist:

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

Juniperion thuriferae Rivas-Mart. 1969

Junipero excelsae-Quercion pubescentis Jakucs 1960

Juniperion excelsae Em 1985

Abietion cephalonicae Horvat et al. 1974

Juniperion excelsae-foetidissimae Em ex Matevski et al. 2010 (Matevski et.al. 2010)

Berberido creticae-Juniperion foetidissimae Brullo, Giusso & Guarino 2001 (Brullo et.al. 2001)

Annex 1:

9290 *Cupressus forests (Acero-Cupression)

9560 *Endemic forests with *Juniperus* spp.

9570 **Tetraclinis articulata* forests

Emerald:

G 3.9 Coniferous woodland dominated by Cupressaceae or Taxaceae

MAES:

Woodland and Forest

IUCN:

1.4 Temperate forest

EFT:

10.7 Juniper forests, 10.8 Cypress forest, 10.9 Cedar forest, 10.10 *Tetraclinis articulata* stands

VME:

K3 Juniper & Cypress open woodlands and scrub

Does the habitat type present an outstanding example of typical characteristics of one

or more biogeographic regions?

Yes

Regions

Alpine

Atlantic

Continental

Mediterranean

Justification

This habitat includes various sub-habitats, of which the only the *Cupressus sempervirens* woodlands represent an outstanding example of the Mediterranean biogeographical region from the point of view of their unique presence and total cover in two Mediterranean countries: >98% in Greece and ca. 2% in Cyprus. This broad in concept habitat has a primarily Mediterranean character which it is represented in other regions as a remnant of a past broader distribution (relictual).

Geographic occurrence and trends

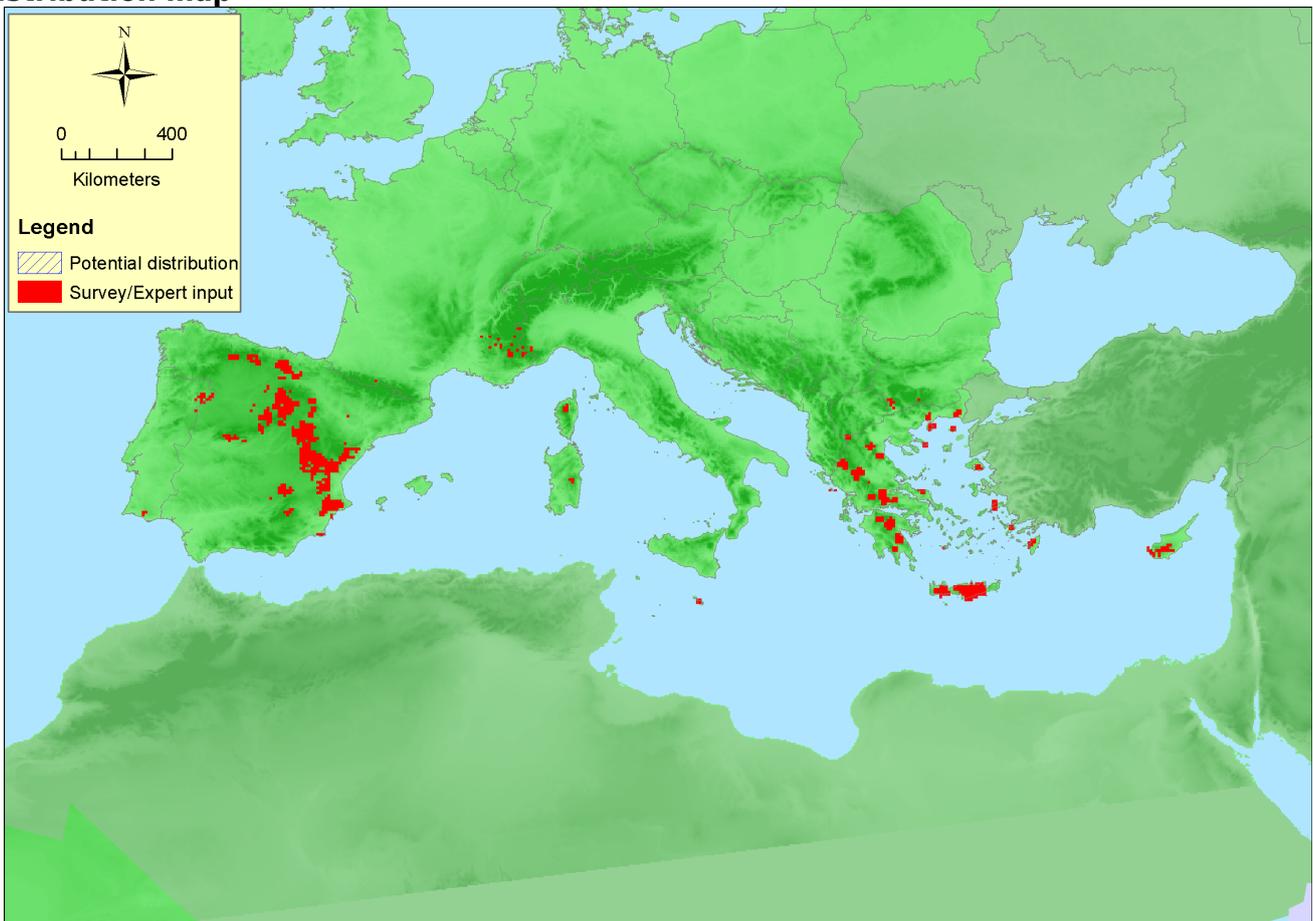
EU 28	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
<i>Bulgaria</i>	Present	6 Km ²	Stable	Decreasing
<i>Cyprus</i>	Present	5.84 Km ²	Stable	Stable
<i>France</i>	France mainland: Present	28 Km ²	Stable	Stable
<i>Greece</i>	Crete: Present East Aegean: Present Greece (mainland and other islands): Present	500.6 Km ²	Increasing	Stable
<i>Italy</i>	Italy mainland: Present Sardinia: Present Sicily: Present	1.7 Km ²	Increasing	Decreasing
<i>Portugal</i>	Portugal mainland: Present	50 Km ²	Increasing	Unknown
<i>Spain</i>	Spain mainland: Present	1089.27 Km ²	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)
<i>Albania</i>	Present	Unknown Km ²	Unknown	Unknown
<i>Former Yugoslavian Republic of Macedonia (FYROM)</i>	Present	32 Km ²	Stable	Stable

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>	2558850 Km ²	770	1713 Km ²	Based on the existing data provided by EU Member States. This number is well representing the current actual total area.
<i>EU 28+</i>	2558850 Km ²	770	32 Km ²	Based on the data provided by one of the EU28+ countries. This number is partially and with uncertainty representing the current actual total area.

Distribution map



The map is rather complete, although some gaps along the Eastern Adriatic coast may exist. Data sources: Art17, EVA.

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

More than 70%

Trends in quantity

The trends of increase and stability in quantity (extent, distribution) have been reported from different countries. The increase and/or stability is mainly related to the reduction of the intensity of the human pressures applied in the *Juniperus* and *Cupressus* woodland communities in the EU28, as well as in the EU28+.

- Average current trend in quantity (extent)
EU 28: Increasing
EU 28+: Stable
- Does the habitat type have a small natural range following regression?
No
Justification
The decline has stopped.
- Does the habitat have a small natural range by reason of its intrinsically restricted area?
No
Justification
The habitat has a broad natural range.

Trends in quality

From the countries that have provided territorial data on quality, it becomes evident that either there is no negative trend or there is only slight decline in quality in parts of its distribution range.

- Average current trend in quality

EU 28: Stable

EU 28+: Stable

Pressures and threats

The most significant pressure and threat for the *Juniperus* and *Cupressus* woodlands -applied more intensively in the past- is extensive woodcutting for timber, firewood, charcoal and fodder at the distribution limits of these Mediterranean woodlands. Large trees have been utilized in the past for making of durables like furniture, but its commercial use is now limited. In some areas firewood may still be extracted from the all the species of *Juniperus*, as well as of *Cupressus sempervirens*. Uncontrolled logging, forest clearance, intensive (over-) grazing and browsing, as well as uncontrolled logging may severely influence regeneration patterns and typical structure affecting the conservation status of these woodlands. Competition with broad-leaved deciduous species also contributes to structural and functional changes of the Mediterranean *Cupressaceae* woodlands.

List of pressures and threats

Sylviculture, forestry

Forestry clearance

Removal of forest undergrowth

Forest exploitation without replanting or natural regrowth

Grazing in forests/ woodland

Natural System modifications

Burning down

Reduction or loss of specific habitat features

Anthropogenic reduction of habitat connectivity

Natural biotic and abiotic processes (without catastrophes)

Species composition change (succession)

Conservation and management

According to the present knowledge, no specific management measures are implemented within the distribution area of this habitat (EU28, EU28+); it is rather not necessary for the conservation of the Mediterranean *Cupressaceae* woodlands, due also to the changes in the pastoral systems and the abandonment of villages. Permanent plots monitoring of the structural elements (including their floristic composition) would support the restoration measures to be undertaken in the cases of unfavorable conservation status. The management measures should be in the direction of keeping the openings among the sparsely distributed *Juniperus* spp. and *Cupressus* woodlands.

List of conservation and management needs

No measures

No measures needed for the conservation of the habitat/species

Measures related to forests and wooded habitats

Restoring/Improving forest habitats

Measures related to special resource use

Regulating/Management exploitation of natural resources on land

Conservation status

Annex I:

9290 MED FV

9560: ALP U1, ATL XX, CON U1, MAC U1, MED U2

9570: MED U1

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

The recovery of this habitat should only be based on natural processes (spontaneous regeneration), under the precondition that a well worked out management plan will be implemented regulating the grazing and thus the survival of the seedlings from the trampling and browsing.

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	-0.4 %	unknown% %	unknown% %	unknown% %
EU 28+	-0.4 %	unknown% %	unknown% %	unknown% %

The reduction in quantity is very slight; the calculation (estimation of the decline) is based on almost all the countries that have provided territorial data (except France for which no trend has been reported).

Criterion B: Restricted geographic distribution

Criterion B	B1				B2				B3
	EOO	a	b	c	AOO	a	b	c	
EU 28	>50000 Km ²	No	Unknown	Unknown	>50	No	Unknown	unknown	Uknown
EU 28+	>50000 Km ²	No	Unknown	Uknown	>50	No	Unknown	Unknown	Uknown

The habitat is relatively widespread in the Mediterranean with main distribution areas in Portugal and Spain to the western part of the Mediterranean and in Greece to the eastern part of the Mediterranean. The EOO is larger than 50000 and the AOO larger than 50 km².

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	0.22 %	0.25 %	unknown %	unknown %	unknown %	unknown %
EU 28+	<1 %	<1 %	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%

The decline in quality is estimated on the basis of the national experts estimates (countries that have provided data); no or slightly affected area (0.25%) of low severity has been reported for the habitat. The current trend regarding the biotic and abiotic quality of the habitat is stable to slightly decreasing to one country.

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	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

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

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