G3.7 Mediterranean lowland to submontane Pinus woodland

Summary

This habitat includes forests of *Pinus halepensis*, *P. brutia*, *P. pinaster* and *P. pinea* distributed on infertile soils mainly within the Mediterranean biogeographic region where they have played a fundamental role in shaping the traditional landscapes. They occur at a variety of altitudes on different substrates, the associated floras varying accordingly. Uncontrolled fire, often related to land abandonment and development processes, is a threat and grazing afterwards can influence regeneration. Integrated landscape management is essential to retain this habitat within the often complex contexts in which it occurs.

Synthesis

The habitat type qualifies as Least Concern (LC) because it has an extensive distribution (total estimated area, EOO and AOO) across the Mediterranean and a small part also to the Continental biogeographical zones, the reduction in quantity over the past 50 years has been very small (ca 2%) and in most areas the habitat has been stable (regarding its spatial extent). The decline in quality (abiotic and/or biotic) is slight to moderate (average severity 44%) affecting 5% of the extent of the habitat throughout its distribution over the past 50 years.

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

All described sub-habitat types, but especially the *Pinus pinea* indigenous woodlands, should be examined in a more detailed way.

Habitat Type

Code and name

G3.7 Mediterranean lowland to submontane Pinus woodland

Pinus halepensis forests at the lake Tsivlou in North Peloponnisos (Photo: I. Kokkoris).

Pinus pinea forests at the Strofilia area (Western Peloponnisos, Greece) where the most extensive forests of this type occur (Photo: I. Kokkoris).

Habitat description

Mediterranean lowland to submontane *Pinus* woodlands include forests of *Pinus halepensis* Mill., *P. brutia* Ten., *P. pinaster* Aiton and *P. pinea* L. These forests occur mainly within the Mediterranean biogeographic region of Europe, in areas with Csa, Csb and BSk climate type according to Köppen's classification and play a fundamental role in shaping the Mediterranean landscape. The three former pine species are fire resilient and produce a high number of serotinous cones.

• *P. halepensis* is distributed all over southern Europe (from Spain to European Turkey), as well as North Africa but is more widespread in the western part of its range. It grows on a variety of soils, and although it occurs more frequently on limestone and marl, it can grow also on very strong acidic soils, as those formed on gneiss (e.g. in Chalkidiki region; NE Greece). It forms stands with understory of evergreen broadleaved species (e.g. *Quercus coccifera, Phillyrea latifolia, Quercus ilex, Arbutus andrachne, Arbutus unedo, Pistacia lentiscus, Smilax aspera*) or phyganic species (e.g. *Erica manipuliflora, Cistus* sp.pl.). The plant communities of Aleppo pine may be considered in many cases as paraclimax vegetation, although in some arid or semi-arid sites they represent mature, stable forests.

• *P. brutia* forests are distributed in the eastern Mediterranean area. In Europe, the *P. brutia* forests are found at the northeastern part of the Greek mainland, at the Aegean islands (e.g. Thasos, Samos, Chios, Kos, Rhodes, Crete) and in Cyprus. They cover lowland to mountainous areas (in Cyprus they reach the altitude of 1600 m a.s.l). *P. brutia* forms open forests, with an understory occupied mainly by Mediterranean woody species, such as *Pistacia lentiscus, Arbutus unedo, Phillyrea latifolia, Olea europaea* subsp. *oleaster* and *Rhamnus lycioides* subsp. *oleoides*. It prefers calcareous and fissured soils, but it can be found also on siliceous ones. *P. brutia* often forms climax vegetation types more than its ecologically similar species, *P. halepensis*.

• *P. pinaster* grows on a variety of substrates and is distributed naturally at the western Mediterranean area of Europe (Iberian Peninsula, France and Italy), as well as at the northwest part of Africa. However, it is considered indigenous only in the Iberian Peninula. It has been widely used in reforestation and afforestation. It occupies sites with an unstable substrate, where soil conditions prevent the development of *Quercus* forests.

• *P. pinea* is distributed all over southern Europe (from Portugal to Greece and Cyprus), as well as in Syria and Lebanon. Its forests are more common in Spain, Portugal and Italy, while are rare in the other countries. Because of its edible seeds, much of its distribution is of artificial origin and it is difficult to determine its natural range. It grows mainly on acidic and sandy soils.

Indicators of quality:

- Natural composition of canopy
- Structural diversity/ complexity with (semi) natural age structure or completeness of layers (diversity of *Pinus* species age classes and existence of at least two - dominant and dominated - tree layers)
- High coverage of *Pinus* individuals in reproductive age (indicator of increased possibilities of successful post-fire recovery and low frequency of forest fires).
- Typical flora and fauna composition of the region
- Presence of old trees and a variety of dead wood (lying or standing) and the associated flora, fauna and fungi
- Absence or low cover (<5%) of non-native, of ruderal and grassland plant species in all layers
- Adequate regeneration of *Pinus* species in both the herb and shrub layers, although in some cases adequate regeneration is possible only after a forest fire.
- Existence of a shrub layer with cover higher than 50% (indicates natural formed forests and not disturbed).
- Low levels of soil compactness, absence of trampling and erosion (especially in the form of rills and

gullies), high cover of litter and well developed A_h horizon (indicates low intense of disturbances and adequate nutrient cycle).

Characteristic species:

Acer monspessulanum, *Aetheorhiza bulbosa*, *Allium subhirsutum*, *Alyssum lesbiacum*, *Anthyllis hermanniae*, *Arbutus andrachne*, *Arbutus unedo*, *Arisarum vulgare*, *Asparagus acutifolius*, *Asparagus aphyllus*, *Carex distachya*, *Carex flacca*, *Carex hallerana*, *Ceratonia siliqua*, *Cistus albidus*, *Cistus creticus*, *Cistus monspeliensis*, *Cistus salviifolius*, *Clematis flammula*, *Coronilla minima*, *Crataegus monogyna*, *Crepis fraasii*, *Daphne gnidium*, *Erica arborea*, *Erica manipuliflora*, *Eryngium campestre*, *Euphorbia spinosa*, *Galium rubrum*, *Genista acanthoclada*, *Genista fasselata*, *Genista hispanica*, *Hedera helix*, *Hieracium pilosella*, *Hippocrepis emerus*, *Jasminum fruticans*, *Juniperus oxycedrus*, *Juniperus phoenicea*, *Lonicera implexa*, *Myrtus communis*, *Odontites luteus*, *Olea europaea*, *Ononis minutissima*, *Osyris alba*, *Phillyrea angustifolia*, *Phillyrea latifolia*, *Pinus brutia*, *Pinus halepensis*, *Pinus pinaster*, *Pinus pinea*, *Pistacia lentiscus*, *Pistacia terebinthus*, *Prasium majus*, *Psoralea bituminosa*, *Quercus coccifera*, *Quercus ilex*, *Rhamnus alaternus*, *Rhamnus lycioides*, *Rhamnus myrtifolius, Rhamnus velutinus, Rosa sempervirens*, *Rosmarinus officinalis*, *Rubia peregrina*, *Rubus ulmifolius*, *Ruscus aculeatus*, *Sanguisorba minor*, *Smilax aspera*, *Spartium junceum*, *Staehelina dubia*, *Stipa bromoides*, *Teucrium chamaedrys*, *Teucrium montanum*, *Thymus vulgaris.*

Classification

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

EUNIS:

G3.7 Lowland to montane mediterranean *Pinus* woodland (excluding *Pinus nigra*)

EuroVegChecklist:

Pistacio lentisci-Pinion halepensis Biondi, Blasi, Galdenzi, Pesaresi et Vagge in Biondi et al. 2014

Alkanno baeoticae-Pinion halepensis Mucina et Dimopoulos in Mucina et al. 2009

Salvio officinalis-Pinion brutiae Konstantinidis et Mucina in Willner et al. 2014

Pinion pineae Feinbrun 1959

Annex I:

9540 Mediterranean pine forests with endemic Mesogean pines

Emerald:

G3.7 Lowland to montane mediterranean Pinus woodland

MAES-2:

Woodland and forest

IUCN:

1.4 Temperate Forest

EFT:

10.1 Thermophilous pine forest

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

or more biogeographic regions?
Yes

Regions
Mediterranean

Justification
The forests included to this habitat are typical and cover an extensive area in the Mediterranean biogeographical region.

Geographic occurrence and trends

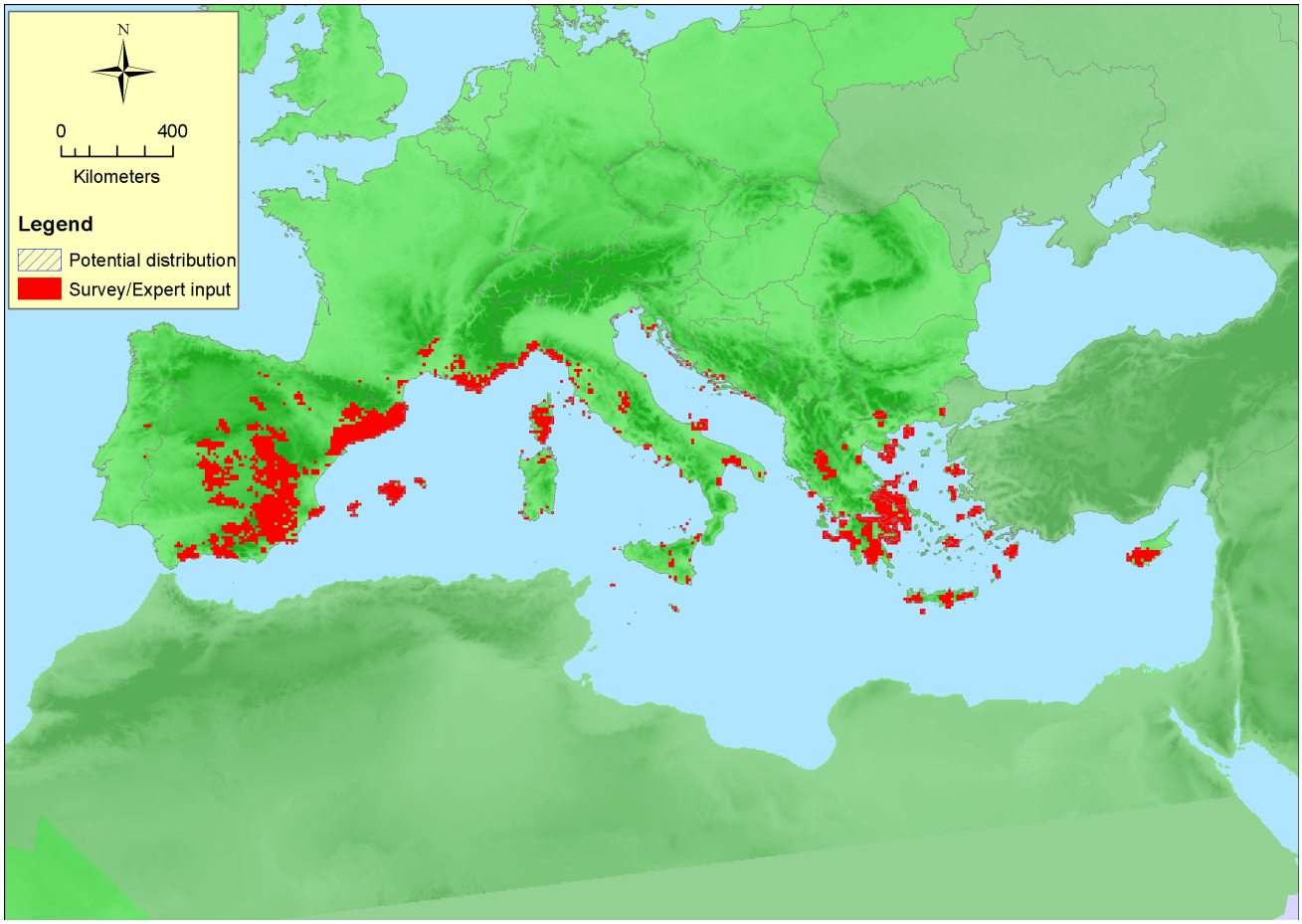
EU 28	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
Croatia	Present	170 Km^2	Unknown	Unknown
Cyprus	Present	1291 Km^2	Stable	Stable
France	Corsica: Present France mainland: Present	3770 Km^2	Stable	Stable
Greece	Crete: Present East Aegean: Present Greece (mainland and other islands): Present	6882 Km^2	Increasing	Increasing
Italy	Italy mainland: Present Sardinia: Present Sicily: Present	939 Km^2	Stable	Stable
Portugal	Portugal mainland: Present	511 Km^2	Decreasing	Unknown
Slovenia	Present	Unknown Km^2	Unknown	Unknown
Spain	Spain mainland: Present	140 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)
Albania	Present	Unknown Km^2	Unknown	Unknown
Former Yugoslavian Republic of Macedonia (FYROM)	Present	Unknown Km^2	Unknown	Unknown
Montenegro	Present	19 Km^2	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	2734150 Km^2	2352	13582 Km^2	
EU 28+	2734150 Km^2	2395	13582 Km^2	

Distribution map



The map is rather complete, with some data gaps for the eastern Adriatic coastal areas. Data sources: EVA, Art17.

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

More than 90% of the current distribution of the habitat type lies within the EU 28.

Trends in quantity

The extent of this habitat is generally stable to increasing and only in Portugal it is given as slightly decreasing.

- 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 has a large EOO and there has been no significant regression of the natural range of this habitat.
- Does the habitat have a small natural range by reason of its intrinsically restricted area?
  No
  Justification
  The habitat has a large natural range and occurs across the Mediterranean lowland to submontane zones playing a fundamental role in shaping the Mediterranean landscape.

Trends in quality

The average trend in quality is more or less stable throughout the distribution range of the habitat, over

the last 50 years. Most countries (among the ones that provided territorial data) report either no present-past decline in habitat quality or a slight decline with an intermediate severity, with reference to the last 50 years.

- Average current trend in quality
  EU 28: Stable
  EU 28+: Stable

Pressures and threats

Fire, although considered an integral part of the Mediterranean ecosystems, is a major factor of disturbance, a destructive factor from the view of reducing large areas of *Pinus* woodlands in the Mediterranean region. Especially the forest fires in the wildland-urban interface have become very common in the Mediterranean, as population and human infrastructure facilities are disseminated throughout the forest zones, especially in the vicinity of large cities and tourist resorts and also due to afforestation of abandoned agricultural lands located close to settlements. Agrarian activities, land abandonment and development processes are important underlying factors of fire occurrence in the Mediterranean. Grazing is a factor affecting the post-fire restoration of the pine Mediterranean forests and the mentioned changes in the primary production model in many Mediterranean lowland and sub-mountainous areas are pressures and threats on the *Pinus* woodlands.

List of pressures and threats

Agriculture

Intensive mixed animal grazing

Sylviculture, forestry

Forest and Plantation management & use
Grazing in forests/ woodland

Transportation and service corridors

Roads, motorways

Urbanisation, residential and commercial development

Urbanised areas, human habitation

Natural System modifications

Burning down

Conservation and management

The changes in the traditional landscape mosaic due to the application of reforestation practices (promoted the last five decades in the Mediterranean region), as well as the implementation of forest management practices in certain *Pinus* woodlands throughout their range, resulted in landscapes more susceptible to fuel accumulation which may lead to increased fire occurrence. The spatial variation in fuels is the most important factor influencing fire spread and severity. It is neccessary to implement integrated management plans of the landscape features, in order that a balance between the forest policies (leading to extensive reforestation and forest plantations) and a policy-driven management alternative in abandoned agricultural land is set.

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

Establishing wilderness areas/allowing succession
Manage landscape features

Measures related to hunting, taking and fishing and species management

Specific single species or species group management measures

Measures related to special resouce use

Regulating/Management exploitation of natural resources on land

Conservation status

Annex I:

9540: MED U1, CON U2

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

The effects of fire on ecosystems and landscapes vary from region to region as a result of fire history, regeneration patterns and topographical constraints and depending on the species (*Pinus halepensis, P. brutia* and *P. pinaster* from the one side and *P. pinea* on the other side). The time for woodlands recovery also varies from 10 to 50 years. This is why we are using two alternatives (naturally and through intervention) when completing the information below on the required effort. The first choice should be to let the restoration process through natural regeneration.

Effort required

10 years	20 years
Through intervention	Naturally

Red List Assessment

Criterion A: Reduction in quantity

Criterion A	A1	A2a	A2b	A3
EU 28	-2 %	Unknown %	Unknown %	Unknown %
EU 28+	-2 %	Unknown %	Unknown %	Unknown %

The estimated reduction in quantity (area covered by the *Pinus* woodlands) is due to fires that have burnt extensive areas over the past 50 years in Portugal, Spain and Italy; for the other countries quantitative data on the trend are not provided. However the reduction in quantity, which locally is often higher, is compansated in most cases (e.g. France and Greece) by the increase of the pine forest extent due to the observed decrease of pastoral land use; this is also due to the abandonment of agro-pastoral practices which promotes the expansion of the *Pinus* forests of the habitat.

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	Unknown
EU 28+	>50000 Km^2	No	Unknown	Unknown	>50	No	Unknown	Unknown	Unknown

The geographic distribution of the habitat is not restricted and there is not a reported continuing decline in spatial extent of the habitat. The Extent of Occurrence (EOO) and the Area of Occupancy (AOO) are substantially large (sources: HT 9540 + Alterra).

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	5 %	44 %	Unknown %	Unknown %	Unknown %	Unknown %
EU 28+	5 %	44 %	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 on the trend in quality, it is evident that over the last 50 years as an average no decline or a slight decline in quality (extent of degradation equals 2%) with moderate severity (44%) has been reported.

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

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