F3.1a Lowland to montane temperate and submediterranean Juniperus scrub

Summary

This habitat of temperate and submediterranean scrub dominated by *Juniperus communis* subsp. *communis* is widespread through the lowlands and montane belt of Europe It occurs on both nutrient poor, calcareous soils where the associated flora has much in common with calcicolous grasslands, and deep sandy more acidic soils, where the vegetation is heathy. The habitat is part of old, pastoral landscapes needing extensive grazing and has suffered much from abandonment or the eutrophication that comes with agricultural improvement. Natural recovery of the habitat seems quite difficult.

Synthesis

All provided data lead to the conclusion that the habitat qualifies as Least Concern (LC) for both trends in quantity and trends in quality. For both indiactors there is a slight negative trend, but these are relatively far from the threshold for Vulnerable. Only the provided data for long term historical trends would lead to the catagory Vulnerable (VU), but there is limited data on this indicator, covering less than 10% of the area of the type, and it is likely that these data are not representative for the complete range.

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 main division for the habitat would be in a subtype on acidic soils, and one on calcareous soils. These subtypes have very few species in common, except for the shrub *Juniperus communis* subsp. *communis* itself. It is unknown whether one of these subtypes is more vulnerable than the other, and the provided data does not provide any information on this.

Habitat Type

Code and name

F3.1a Lowland to montane temperate and submediterranean Juniperus scrub

Scrub of *Juniperis communis* subsp. *communis* in mosaic with dry heathland of the *Calluno-Genistion pilosae* in the Natura 2000 site Drouwenerzand in the Netherlands (Photo: John Janssen).

Calcareous grassland in the Eifel Mountains near Ahlendorf (Germany) with individual shrubs of *Juniperus communis* subsp. *communis*, in some spots forming more dense scrub formations (Photo: John Janssen).

Habitat description

Temperate and submediterranean scrubs, up to 7-8 m, with *Juniperus communis* subsp. *communis* are widespread in the lowland and low mountain regions of Europe, where these communities occur on nutrient poor, calcareous soils as well as on deep sandy soils. The edaphic conditions range from dry to rather moist. The first group is related to grasslands of the class *Festuco-Brometea*, the second one to heathlands of the class *Calluno-Ulicetea*. Apart from the dominant *Juniperus communis*, these vegetation types have hardly any species in common. On calcareous sediments, the grasses *Brachypodium pinnatum* and/or *Bromus erectus* are codominant, accompanied by a wide variety of species, including *Anthyllis vulneraria*, *Carlina vulgaris*, *Centaurea scabiosa*, *Dianthus carthusianorum*, *Euphorbia cyparissias*, *Sanguisorba minor* and *Scabiosa columbaria*. On sandy soils, *Calluna vulgaris*, *Genista pilosa* and *Genista anglica* are prominent dwarf-shrubs in the surrounding vegetation, together with *Deschampsia flexuosa*, *Carex pilulifera*, *Festuca filiformis* and a wide variety of mosses and lichens. The usual woody associates, particularly on neutral and calcareous soils, are *Rosa canina*, *Crataegus monogyna*, *Prunus spinosa*, *Cornus sanguinea* and *Rubus plicatus*. The junipers show a striking variety in growth forms, ranging from upright to prostrate, quite often occurring in mixed populations.

This habitat type often occurs in patchy mosaics with grasslands and heathlands. As such, these are part of old, pastoral landscapes, which require a specific management regime of extensive grazing. When abandoned and neglected, the succession will finally lead to woodland, where *Juniperus communis* may persist for a long time in the understory. Shrubs and small trees of *Juniperus communis* can become rather old, up to 200 years, but on the long term regeneration is a prerequisite, which is not always the case. Lack of favorable conditions for germination as well as a high grazing pressure by rabbits on juvenile plants may hinder rejuvenation. Of particular importance is the occurence of a large number of rare and endangered fungi.

Not included in F3.1a are the *Juniperus communis* formations of the subalpine and alpine regions of high mountains nor the Pannonic juniper-poplar steppe woods. The first group is assigned to Red List type F2.2b, the second group is classified under Red List type G1.7a.

Indicators of good quality:

- Mosaic of juniper shrubs with grasslands or heathland
- Variety of growth forms of different age, including juvenile plants
- Presence of rare fungi
- Extensive grazing regime which guarantees the complex landscape settings and prohibits a complete succesion towards woodland

Characteristic species:

Vascular plants: *Juniperus communis*

Birds: *Anthus campestris*, *Caprimulgus europaeus*, *Lullula arborea*, *Oenanthe oenanthe*, *Sylvia borin*, *Sylvia curruca*

Insects: *Phymatodes glabratus* (beetle), *Thera juniperata* (butterfly), *Gonocerus juniperi* (bug).

Classification

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

EUNIS:

F3.1 Temperate thickets and scrub

Annex 1:

5130 Juniperus communis formations on heaths or calcareous grasslands

EuroVegChecklist:

Brachypodio pinnati-Juniperion communis Mucina in Mucina et al. 2013

Vaccinio-Juniperion communis Passarge in Passarge et G. Hofmann 1968

Emerald:

F3.16 Juniperus communis scrub

MAES-2:

Heathland and shrub

IUCN:

3.4 Temperate shrubland

Does the habitat type present an outstanding example of typical characteristics of one or more biogeographic regions?
No

Justification
The habitat type is widespread in the EU28 with major areas in the Atlantic and Continental biogeographic region, but extending into the Boreal, Alpine and (sub)Mediterranean biogeographic regions, including parts of EU28+. The habitat probably also occurs outside the EU.

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)
Austria	Uncertain	Unknown Km^2	Unknown	Unknown
Belgium	Present	Unknown Km^2	Unknown	Unknown
Bulgaria	Present	10 Km^2	Decreasing	Decreasing
Croatia	Present	Unknown Km^2	Unknown	Unknown
Czech Republic	Present	2 Km^2	Stable	Decreasing
Denmark	Present	14 Km^2	Decreasing	Decreasing
Estonia	Present	Unknown Km^2	Unknown	Unknown
Finland	Finland mainland: Uncertain	Unknown Km^2	Unknown	Unknown
France	France mainland: Present	200 Km^2	Decreasing	Decreasing
Germany	Present	52 Km^2	Decreasing	Decreasing
Greece	Greece (mainland and other islands): Uncertain	Unknown Km^2	Unknown	Unknown
Hungary	Present	15 Km^2	Decreasing	Decreasing
Ireland	Present	47 Km^2	Unknown	Unknown
Italy	Italy mainland: Present	598 Km^2	Increasing	Decreasing
Latvia	Present	0.7 Km^2	Unknown	Decreasing
Lithuania	Present	1 Km^2	Decreasing	Decreasing
Luxembourg	Present	Unknown Km^2	Unknown	Unknown

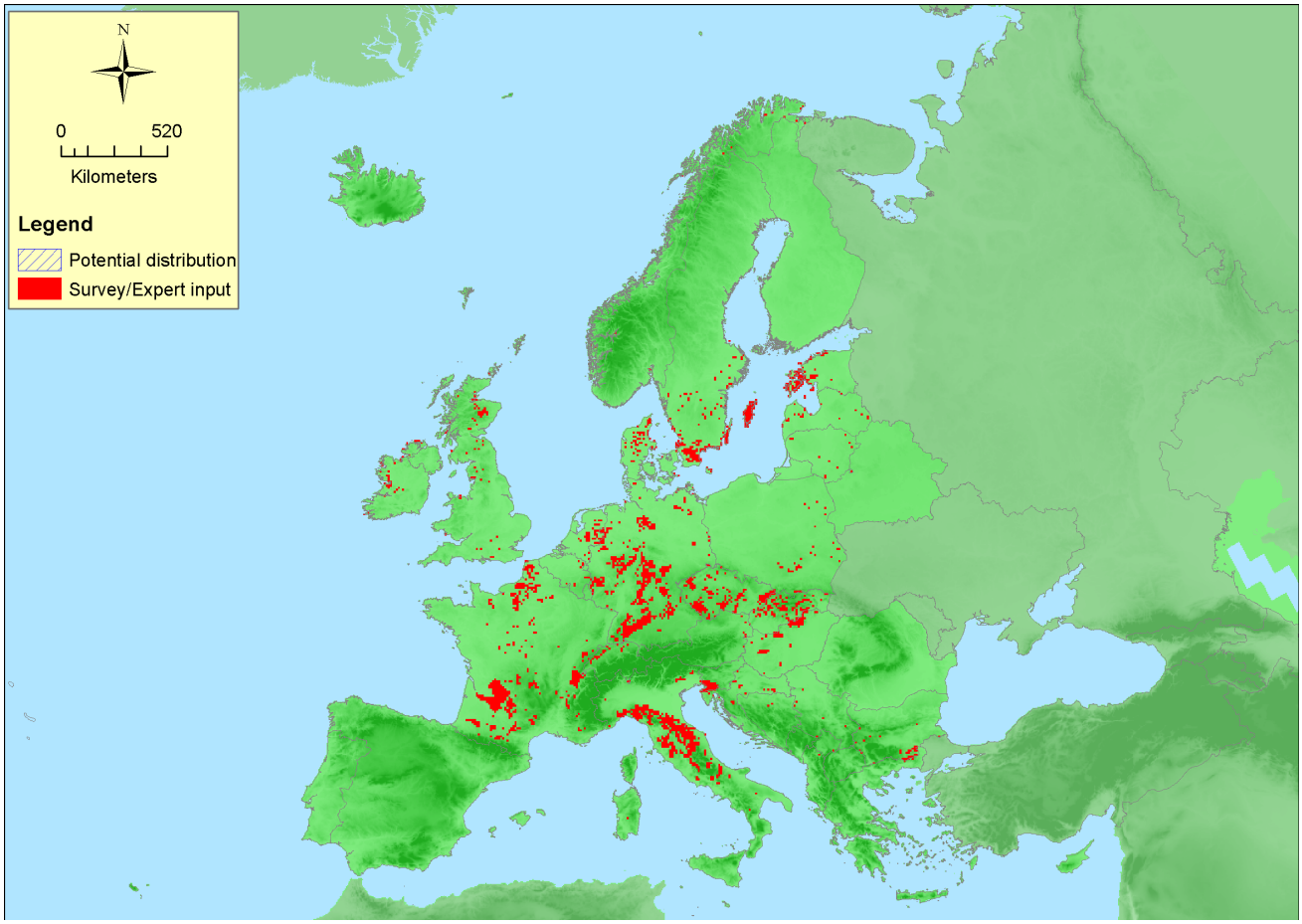
EU 28	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
Netherlands	Present	0.5 Km^2	Stable	Decreasing
Poland	Present	unknown Km^2	Unknown	Unknown
Romania	Uncertain	unknown Km^2	Unknown	Unknown
Slovakia	Present	142 Km^2	Decreasing	Decreasing
Slovenia	Present	110 Km^2	Increasing	Stable
Spain	Spain mainland: Present	9.3 Km^2	Unknown	Unknown
Sweden	Present	unknown Km^2	Unknown	Unknown
UK	United Kingdom: Present	29 Km^2	Decreasing	Decreasing

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	Uncertain	unknown Km^2	Unknown	Unknown
Bosnia and Herzegovina	Present	50 Km^2	Increasing	Decreasing
Former Yugoslavian Republic of Macedonia (FYROM)	Uncertain	unkown Km^2	Unknown	Unknown
Iceland	Uncertain	unknown Km^2	Unknown	Unknown
Isle of Man	Uncertain	unknown Km^2	Unknown	Unknown
Kaliningrad	Uncertain	unknown Km^2	Unknown	Unknown
Kosovo	Uncertain	unknown Km^2	Unknown	Unknown
Montenegro	Uncertain	unknown Km^2	Unknown	Unknown
Norway	Norway Mainland: Uncertain	unknown Km^2	Unknown	Unknown
Serbia	Uncertain	unknown Km^2	Unknown	Unknown
Switzerland	Present	0.1 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	5989900 Km^2	2234	1300 Km^2	Not all countries provided data yet
EU 28+	6235900 Km^2	2297	1350 Km^2	Not all countries provided data yet

Distribution map



The map is rather complete, with some possible gaps in the Balkan and unclear boundaries to F2.2c. Data: Art17, EVA.

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

About 90% of the habitat lies within Europe and about 70% in the EU28.

Trends in quantity

On average the extent of the habitat has decreased. The decrease is relatively low, on average -9% for the EU28 and -7% for the EU28+. These values are based on relatively good data, covering more than 80% of the range of the habitat. Only four countries provided data on long time historical loss of extent, but they all reported a strong decrease in area: Denmark (80%), Germany (50-70%), Hungary (50-90%), Netherlands (66%). However, in some of the southern countries (Italy) the habitat at present is expanding, due to abandonment of traditional management.

- Average current trend in quantity (extent)
  EU 28: Decreasing
  EU 28+: Decreasing
- Does the habitat type have a small natural range following regression?
  No
  Justification
  The habitat has a wide range in Europe.
- Does the habitat have a small natural range by reason of its intrinsically restricted area?
  No
  Justification
  Juniperus communis subsp. communis has a wide distribution over Europe, and so does the scrub that is built up by this species. Stands can have various sizes, from one to many hectares.

Trends in quality

A reduction of quality affects on average about 14% of the area, both for EU28 and for EU28+. The severity of degradation in this affected part of the area is however relatively high (>40%). A variety of pressures have been reported: changes in species composition, eutrophication, fire, succession, cutting, overgrazing, abandonment, and urbanisation.

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

Pressures and threats

A variety of pressures have been reported: changes in species composition, eutrophication, fire, succession, cutting, overgrazing, abandonment, and urbanisation. The main causes seem to be the decline of traditional land use and eutrophication. The habitat is part of old, pastoral landscapes, which require a specific management regime of extensive grazing. As a result of economic developments, there is a general trend of abandonment in marginal areas of Europe, leading to succession and final loss of the habitat. Also there is an increase of intensive husbandry in more densely populated areas including conversion of the habitat into intensive arable land or heavily fertilized grasslands. Rejuvenation of *Juniperus communis* subsp. *communis* is often difficult and this can be a limiting factor for the future. Since the early 20th century *Juniperus communis* declined all over North-West Europe except Scandinavia. This was caused by land reclamation of nature areas. In Slovenia and Bosnia & Herzegovina the habitat increased in extent, probably as a result of extensification, but in the long run without adequate management, it is assumed that succession will lead to a decline. Finally, *Juniper* is vulnerable for fire and bioaccumulation will raise fire hazards, especially in submediterranean areas.

List of pressures and threats

Agriculture

Modification of cultivation practices
Agricultural intensification
Abandonment of pastoral systems, lack of grazing

Urbanisation, residential and commercial development

Urbanised areas, human habitation

Natural System modifications

Fire and fire suppression

Conservation and management

In most situation, both on baserich and acidic soils, an extensive grazing regime seems the best management to keep the shrubland open, preserve the species diversity and to prevent succession towards forest. Where problems exist with rejuvenation of *Juniperus communis* subsp. *communis*, research is needed on the best restoration strategies, which may include restoring of open sites for seedling by short periods of overgrazing or even by fire. Where sites are still under pressure of building and urbanisation, establishment of protected areas is required.

List of conservation and management needs

Measures related to agriculture and open habitats

Other agriculture-related measures
Maintaining grasslands and other open habitats

Measures related to spatial planning

Establish protected areas/sites

Measures related to hunting, taking and fishing and species management

Specific single species or species group management measures

Conservation status

Annex I:

5130: ALP U1, ATL U1, BOR XX, CON U1, MED FV, PAN U1

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

Natural rejuvenation of the habitat is often difficult, depending on the circumstances. More research may be necessary, particularly in NW Europe and various questions should be examined (Knol & Nijhoff 2004). It is difficult to estimate how long it will take the habitat to recover. Specimens of *Juniperus communis* subsp. *communis* can become rather old, up to 200 years, but on the long term regeneration is a prerequisite, which is not always the case.

Effort required

50+ years	200+ years
Through intervention	Through intervention

Red List Assessment

Criterion A: Reduction in quantity

Criterion A	A1	A2a	A2b	A3
EU 28	-9.1 %	unknown %	unknown %	unknown %
EU 28+	-7.1 %	unknown %	unknown %	unknown %

The average assessment of trends resulted in a relatively small negative trend over Europe, both for EU28 and EU28+, leading to the conclusion Least Concern. All countries which provided data on long (> 50 years) historical loss of extent, reported a sharp decrease (Denmark -80%, Germany -50/70%, Hungary -50/90%, Netherlands -66%). The trend in these few countries would lead to the Red List category Vulnerable (VU), but in total these countries cover only 6% of the total area. As it is likely that these long-term trends are not representative for some southern countries, the long-term data is considered insufficient for assessing the criterion A3.

Criterion B: Restricted geographic distribution

Criterion B	B1				B2				B3
	EOO	a	b	c	AOO	a	b	c	
EU 28	>50000 Km^2	No	No	no	>50	No	No	no	no
EU 28+	>50000 Km^2	No	No	no	>50	No	No	no	no

The EOO and AOO and the number of locations are much larger than the thresholds for criterion B. The conclusion for criterion B therefore is Least Concern.

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	14.0 %	41.4 %	unknown %	unknown %	unknown %	unknown %
EU 28+	13.9 %	41.0 %	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%

On average in the last about 50 years about 14% of the remaining area in Europe (EU28/EU28+) is negatively affected, with a severity of about 41%. These figures lead to the conclusion Least Concern. The type of quality loss refers both to biotic and abiotic factors and indicators, therefore criterion C and D have not been assessed separately.

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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