

F2.4 Subalpine *Pinus mugo* scrub

Summary

Conifer krummholz scrub dominated by *Pinus mugo* occurs above the timberline and on subalpine screes in the mountains of central and southeastern Europe, on both calcareous and siliceous bedrock. It can be short or tall, closed or open and other shrubs, sub-shrubs and herbaceous associates vary according to soil acidity and wetness. Recovery after periodic burning can be rapid and the scrub can spread into abandoned pastures but a lasting threat is clearance for tourist developments. Careful planning and avoiding burning are the best conservation measures.

Synthesis

The Red List criteria qualify this habitat for a Least Concern (LC) status as there is only a small negative trend in quantity and in quality over the last 50 years, and the habitat is relative widely distributed.

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

No sub-habitats need to be distinguished for further analysis.

Habitat Type

Code and name

F2.4 Subalpine *Pinus mugo* scrub



Extensive stands of the *Pinus mugo* scrub in a glacial cirque in the Retezat Mts, Romania (Photo: Milan Chytrý)



Pinus mugo scrub on the summit of Mt Grosser Arber, Bavarian Forest, Germany (Photo: Milan Chytrý).

Habitat description

Conifer scrub dominated by *Pinus mugo* (krummholz) occurring in the mountains of central and southeastern Europe above the timberline. This scrub is usually 0.5-3 m tall, depending on the wind exposure of the site and the height of winter snow cover. It occurs on Podzols or Leptosols over both calcareous and siliceous bedrock. On calcareous substrates *Pinus mugo* can be accompanied by *Rhododendron hirsutum*, *Rhodothamnus chamaecistus* or *Sorbus chamaemespilus*, in wetter places by *Alnus viridis*. Species composition of the herb and moss layer depends on the bedrock type and adjacent vegetation. Herb layer tends to be more species-rich on calcareous substrates. Dwarf shrubs such as

Vaccinium myrtillus and *V. vitis-idaea* and lichens of the genera *Cladonia* and *Cetraria* are common especially on acidic bedrock. Bryophytes such as *Pleurozium schreberi* often reach a high cover. This scrub occurs in the Hercynic mountains of central Europe, Eastern Alps, Carpathians, Central Apennines, Dinaric Alps and high mountains of the Balkan Peninsula. These areas represent its entire geographical range globally. Near the northern limit of its range in the Hercynic mountains, the belt with *Pinus mugo* scrub occurs at altitudes of 1200-1450 m, while it ascends up to 2500 m in the Balkans. In the Alps *Pinus mugo* scrub occurs mainly in the oceanic north-eastern and south-eastern parts of the mountain range, while it is rare in the Central Alps. On talus slopes *Pinus mugo* scrub can occur also below the timberline. *Pinus mugo* scrub on peatlands does not belong to this habitat type. Under natural conditions, *Pinus mugo* scrub can be both tall and dense or short and open. It can be both species-rich and very species-poor. None of these characteristics indicates habitat quality.

The following characteristics can be considered as indicators of good quality:

- No visible disturbance by trampling, skiing, cutting or burning;
- Absence of ruderal, nutrient-demanding species;
- No indication of scrub origin through planting, especially in places where it is not native.

Characteristic species:

Flora, Vascular plants: *Adenostyles alliariae*, *Alnus viridis*, *Athyrium distentifolium*, *Avenella flexuosa*, *Bruckenthalia spiculifolia*, *Calamagrostis arundinacea*, *C. villosa*, *Daphne oleoides*, *Dryas octopetala*, *Erica carnea*, *Gentiana punctata*, *Homogyne alpina*, *Juniperus communis* subsp. *alpina*, *Pinus mugo* (dom.), *Rhododendron ferrugineum*, *R. hirsutum*, *R. myrtifolium*, *Rhodothamnus chamaecistus*, *Sesleria comosa*, *Solidago virgaurea*, *Sorbus aucuparia*, *S. chamaemespilus*, *Trientalis europaea*, *Vaccinium myrtillus*, *V. uliginosum*, *V. vitis-idaea*

Mosses: *Dicranum scoparium*, *Hylocomium splendens*, *Pleurozium schreberi*, *Rhytidiadelphus triquetrus*

Lichens: *Cetraria islandica*, *Cladina* spp., *Cladonia* spp.

Classification

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

EUNIS:

F2.3 Subalpine deciduous scrub

EuroVegChecklist:

Pinion mugo Pawłowski et al. 1928

Pino mugo-Ericion Leibundgut 1948

Epipactido atropurpureae-Pinion mugo Stanisci 1997

Hyperico grisebachii-Pinion mugo Čarni et Mucina 2014

Annex 1:

4070* Bushes with *Pinus mugo* and *Rhododendron hirsutum* (*Mugo-Rhododendretum hirsuti*)

Emerald:

F2.41 Inner Alpine *Pinus mugo* scrub

F2.42 Outer Alpine *Pinus mugo* scrub

F2.43 Southwestern Pinus mugo scrub

F2.44 Apennine Pinus mugo scrub

F2.45 Hercynian Pinus mugo scrub

MAES-2:

Heathland and shrub

IUCN:

3.4 Temperate shrub

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

Yes

Regions

Alpine

Justification

It is characteristic of subalpine belt.

Geographic occurrence and trends

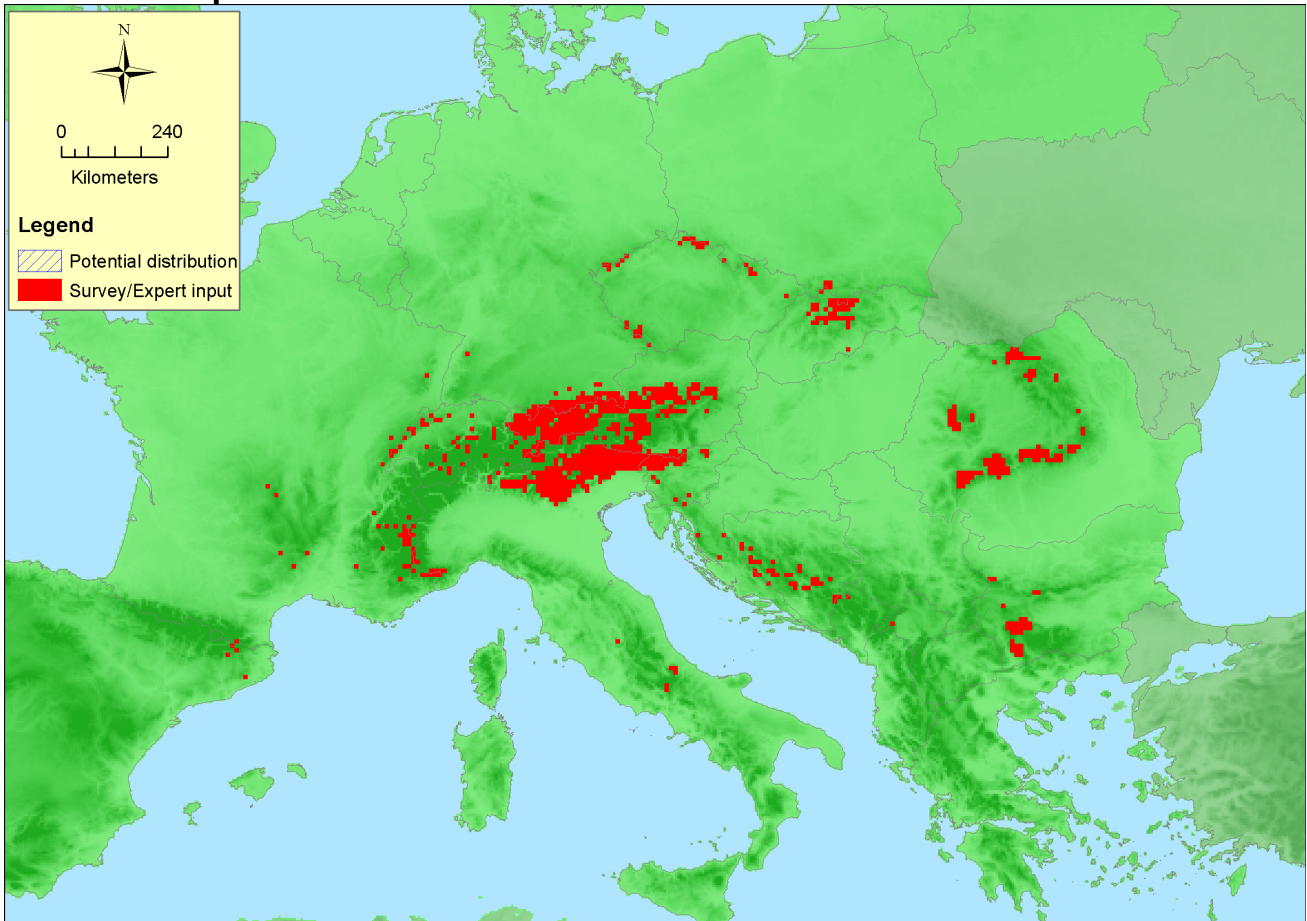
EU 28	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
<i>Austria</i>	Present	540 Km ²	Decreasing	Stable
<i>Bulgaria</i>	Present	150 Km ²	Increasing	Increasing
<i>Croatia</i>	Present	45 Km ²	Stable	Stable
<i>Czech Republic</i>	Present	11 Km ²	Increasing	Stable
<i>France</i>	France mainland: Present	15 Km ²	Increasing	Stable
<i>Germany</i>	Present	145 Km ²	Stable	Stable
<i>Italy</i>	Italy mainland: Present	916.95 Km ²	Stable	Unknown
<i>Romania</i>	Present	500 Km ²	Decreasing	Decreasing
<i>Slovakia</i>	Present	145.55 Km ²	Stable	Stable
<i>Slovenia</i>	Present	145 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>Bosnia and Herzegovina</i>	Present	55 Km ²	Increasing	Stable
<i>Former Yugoslavian Republic of Macedonia (FYROM)</i>	Present	10 Km ²	Stable	Stable
<i>Switzerland</i>	Present	200 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
EU 28	5989900 Km ²	826	2614 Km ²	
EU 28+	6235900 Km ²	2297	2879 Km ²	

Distribution map



The map is rather complete. Data sources: EVA, NAT. Data sources: EVA, ART17, NAT.

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

100 %

Trends in quantity

Quantitative past data are not available, but a stable trend in the distribution area has been observed by the territorial experts. Until the middle of the last century, the communities of Dwarf pine were set on fire in order to livestock grazing. Nowadays, they are destroyed as a result of the construction of ski tracks, tow-lifts and other tourist infrastructure.

- Average current trend in quantity (extent)
EU 28: Stable
EU 28+: Stable
- Does the habitat type have a small natural range following regression?

Yes

Justification

After discontinuation of periodic burning it is observed a relatively rapid recovery of the area.

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

No

Justification

The habitat is restricted by abiotic factors in subalpine areas only.

Trends in quality

After cessation of periodic burning it is observed a relatively rapid recovery of the area. The coenoses of

the Dwarf pine are cut down for construction of ski tracks, tow-lifts and other tourist infrastructure

- Average current trend in quality

EU 28: Stable

EU 28+: Stable

Pressures and threats

The main causes of decrease are: Fires, Cutting, Tourism, Climate change

List of pressures and threats

Sylviculture, forestry

Forestry clearance

Grazing in forests/ woodland

Transportation and service corridors

Paths, tracks, cycling tracks

Human intrusions and disturbances

Skiing complex

Other sport / Leisure complexes

Trampling, overuse

Vandalism

Climate change

Temperature changes (e.g. rise of temperature & extremes)

Conservation and management

After cessation of periodic burning it is observed a relatively rapid recovery of the area. The coenoses of the Dwarf pine are cut down for construction of ski tracks, tow-lifts and other tourist infrastructure. Decrease is due to road and skiing complexes construction. The habitat does not require special conservation measures. However it is necessary to avoid deforestation and burning of the Dwarf pine.

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

Other forestry-related measures

Restoring/Improving forest habitats

Adapt forest management

Conservation status

4070* Bushes with *Pinus mugo* and *Rhododendron hirsutum* (*Mugo-Rhododendretum hirsuti*)

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

The habitat is able to restore naturally, even within relatively short periods.

Effort required

10 years	20 years	50+ years	200+ years
Through intervention	Through intervention	Naturally	Naturally

Red List Assessment

Criterion A: Reduction in quantity

Criterion A	A1	A2a	A2b	A3
EU 28	-9.9 %	unknown %	unknown %	unknown %
EU 28+	-9.1 %	unknown %	unknown %	unknown %

The average European trend over the last 50 years has been calculated from territorial data of 15 countries. The relatively small decline leads to the conclusion Least Concern (LC).

Criterion B: Restricted geographic distribution

Criterion B	B1				B2				B3
	EOO	a	b	c	AOO	a	b	c	
EU 28	>50000 Km ²	Unknown	Unknown	unknown	>50	Unknown	Unknown	unknown	unknown
EU 28+	>50000 Km ²	Unknown	Unknown	unknown	>50	Unknown	Unknown	unknown	unknown

AOO, EOO and number of locations are well above the thresholds for criteria under B, leading to the conclusion Least Concern (LC).

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	<25 %	slight %	unknown %	unknown %	unknown %	unknown %
EU 28+	<25 %	slight %	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%

Calculation of the trend in quality is based on quantitative data from 10 countries. On average a relatively small decline in quality took place, leading to a Least Concern assessment.

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+	
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Least Concern	-	Least Concern	-

Confidence in the assessment

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

Assessors

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References

Šibík, J., Šibíková, I. & Kliment, J. 2010. The subalpine *Pinus mugo* communities of the Carpathians with a European perspective. *Phytocoenologia* 40: 155–188.

Sanda, V., Barabas, N. & Bită-Nicolae, C., 2005. *Breviar privind parametrii structurali și caracteristicile ecologice ale fitocenozelor din România*. Part I. Ion Borcea Press. Bacău, Romania.

Chytrý, M. (2013, ed.). *Vegetation of the Czech Republic. 4. Forest and scrub vegetation*. Academia Praha, Prague.

Rodwell, J.S. (1992, ed.). *British Plant communities Volume 3. Grasslands and montane communities*.

Cambridge University Press, Cambridge.