

## G3.4a Temperate continental *Pinus sylvestris* woodland

### Summary

This habitat occurs patchily across the hemiboreal and northern temperate zone of Europe where the light-demanding *Pinus sylvestris* has a competitive advantage on more nutrient-poor soils less favourable to *Picea abies* or broad-leaved deciduous trees, or beyond their geographical range. The density of the pine canopy can vary and unable to rejuvenate beneath denser canopies or in a thick moss and litter carpet, the *Pinus* is naturally dependent on fire or canopy clearance for regeneration, so even-aged groves are common. Woody associates and the heathy field layer reflect the more common acidic character of the soils but distinctive basiphilous and psammophilous floras appear locally where the habitat develops on limestones and inland sands. Logging and conversion to forestry plantations, extraction of sand or stone, development of infrastructure, eutrophication, natural succession and forest grazing all threaten this habitat. Conservation measures suggested for this habitat include protection of existing stands, application of nature-friendly forestry management, and continuation of historical management in places where these forests are a legacy of the past.

### Synthesis

The habitat is assessed as Near Threatened (NT) based on criterion C/D1, because it has experienced a slight decline in quality (42-43% severity affecting 66% of its extent, which is close to the threshold for Vulnerable (50% decline affecting 50% of the extent of the habitat).

Overall Category & Criteria			
EU 28		EU 28+	
Red List Category	Red List Criteria	Red List Category	Red List Criteria
Near Threatened	C/D1	Near Threatened	C/D1

### Sub-habitat types that may require further examination

Central European lowland subtypes of this habitat type are of special conservation concern, since they are threatened by eutrophication and associated succession involving replacement of pine with broad-leaved trees. This habitat type also includes Annex I types that require special attention: 91C0 Caledonian forest, representing geographically isolated and rather unique stands in the Scottish Highlands, 91T0 Central European lichen Scots pine forests, which are often developed in small patches, are particularly sensitive to eutrophication, and quickly disappear due to successional changes, and 91U0 Sarmatic steppe pine forest, which has a higher species diversity than the other subtypes.

### Habitat Type

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#### Code and name

G3.4a Temperate continental *Pinus sylvestris* woodland



*Pinus sylvestris* forest with *Vaccinium myrtillus* on quarcite outcrops near Aš in the western Czech Republic (Photo: Milan Chytrý).



*Pinus sylvestris* forest with rich moss layer on acidic inland sand dunes near Lakšárska Nová Ves in western Slovakia (Photo: Milan Chytrý).

## Habitat description

These are *Pinus sylvestris* woodlands with patchy occurrence across the hemiboreal and northern temperate zone of Europe. This light-demanding tree has a competitive advantage on more nutrient-poor soils that are less favourable to *Picea abies* or broad-leaved deciduous trees, or are beyond their geographical range. The pine canopy is often rather open in southern Scandinavia, more closed to the west in Scotland and further south where the woodland occurs across north Germany, Poland, Latvia and Lithuania and into Ukraine and Russia. Unable to rejuvenate beneath denser canopies or in a thick moss and litter carpet, the pine is naturally dependent on fire or canopy clearance for regeneration, so even-aged groves are common. Common associates in the canopy are *Betula pendula*, *B. pubescens*, *Populus tremula*, *Juniperus communis* and *Sorbus aucuparia*. Other local *Sorbus* spp., *Quercus robur* and *Frangula alnus* are found more commonly further south. Beneath, there is a cover of *Vaccinium myrtillus*, *V. vitis-idaea*, *Arctostaphylos uva-ursi*, *Rubus saxatilis* and *Melampyrum pratense* together with more thermophilous nemoral plants such as *Hepatica nobilis*, *Melica nutans*, *Anemone nemorosa*, *Carex digitata* and *Epipactis atrorubens*. Contrasts in soils also exert an influence on the associated flora, a dry grassland and meadow contingent with basiphilous species characterizing the pine woodlands of limestones with rendzinas in southern Sweden, Öland and Gotland, while more calcifuge species appearing on the podzols of the outwash plains, periglacial deposits and river terraces of the northern European plain – *Luzula pilosa*, *Pyrola chlorantha*, *Carex digitata*, *Hylocomium splendens*, *Dicranum scoparium*, *D. polysetum* and *Pleurozium schreberi*. On the inland sands of Poland, psammophytic pine woodlands have *Peucedanum oreoselinum*, *Anthericum ramosum* and *Dianthus carthusianorum*. In some subtypes extensive cover of lichens can occur with mostly *Cetraria* and *Cladonia* species.

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 of the region.
- 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 and fauna).
- No signs of eutrophication or pollution.
- No signs of acidification (relevant mainly for oligotrophic or acidic types).
- No man-induced very high population levels of ungulates.

Characteristic species:

Canopy trees and shrubs: *Pinus sylvestris*, *Betula pendula*, *B. pubescens*, *Populus tremula*, *Juniperus communis*, *Sorbus aucuparia*, *Quercus robur*, *Frangula alnus*.

Field layer: *Vaccinium myrtillus*, *V. vitis-idaea*, *Arctostaphylos uva-ursi*, *Rubus saxatilis*, *Melampyrum pratense*, *Agrostis coarctata*, *Avenella flexuosa*, *Pyrola chlorantha*.

Mosses: *Hylocomium splendens*, *Pleurozium schreberi*, *Leucobryum glaucum*, *Dicranum polysetum*, *Polytrichum piliferum*, *P. juniperinum*.

Lichens: *Cladonia arbuscula*, *Cladonia portentosa*, *C. furcata*, *C. rangiferina* and *Cetraria islandica*.

### **Classification**

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

EUNIS:

G3.4 [*Pinus sylvestris*] woodland south of the taiga

G3.5 [*Pinus nigra*] woodland

EuroVegChecklist:

*Caragano fruticis-Pinion sylvestris* Solomeshch et al. 2002

*Veronico teucrii-Pinion sylvestris* Ermakov et Solomeshch in Ermakov et al. 2000

*Trollio europaei-Pinion sylvestris* Fedorov ex Ermakov et al. 2000

*Dicrano-Pinion* (Libbert 1933) W. Matuszkiewicz 1962

*Festuco-Pinion sylvestris* Passarge 1968

*Koelerio glaucae-Pinion sylvestris* Ermakov 1999

Annex I:

9060 Coniferous forest on, or connected to , glaciofulvial eskers

91C0 Caledonian forest

91T0 Central European lichen scots pine forests

91U0 Sarmatic steppe pine forest

Emerald:

G3.41 Caledonian forest

G3.4232 Sarmatic steppe *Pinus sylvestris* forests

G3.4233 Carpathian steppe *Pinus sylvestris* woods

G3.4234 Pannonic steppe *Pinus sylvestris* woods

MAES-2:

Woodland and forest

IUCN:

1.4 Temperate Forest

EFT:

2.2 Nemoral Scots pine forest

EVM:

D5.3.1 Hemiboreal and nemoral pine forests: Lowland to submontane types & Middle and southern boreal to hemiboreal pine forests: montane type.

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

No

Justification

In the temperate zone *Pinus sylvestris* forests are azonal vegetation. They are more characteristic of the boreal 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)
<i>Austria</i>	Uncertain	Km <sup>2</sup>	Unknown	Unknown
<i>Czech Republic</i>	Present	160 Km <sup>2</sup>	Decreasing	Decreasing
<i>Estonia</i>	Present	34 Km <sup>2</sup>	Stable	Stable
<i>France</i>	France mainland: Present	10 Km <sup>2</sup>	Stable	Stable
<i>Germany</i>	Present	<10 Km <sup>2</sup>	Decreasing	Decreasing
<i>Hungary</i>	Present	11 Km <sup>2</sup>	Decreasing	Decreasing
<i>Italy</i>	Italy mainland: Present	159 Km <sup>2</sup>	Stable	Stable
<i>Latvia</i>	Present	326 Km <sup>2</sup>	Unknown	Decreasing
<i>Lithuania</i>	Present	4500 Km <sup>2</sup>	Stable	Decreasing
<i>Poland</i>	Present	2520 Km <sup>2</sup>	Decreasing	Decreasing
<i>Romania</i>	Uncertain	Unknown Km <sup>2</sup>	Unknown	Unknown
<i>Slovakia</i>	Present	24 Km <sup>2</sup>	Stable	Unknown
<i>Slovenia</i>	Present	150 Km <sup>2</sup>	Stable	Stable
<i>Sweden</i>	Present	Unknown Km <sup>2</sup>	Unknown	Unknown
<i>UK</i>	United Kingdom: Present	245 Km <sup>2</sup>	Stable	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)
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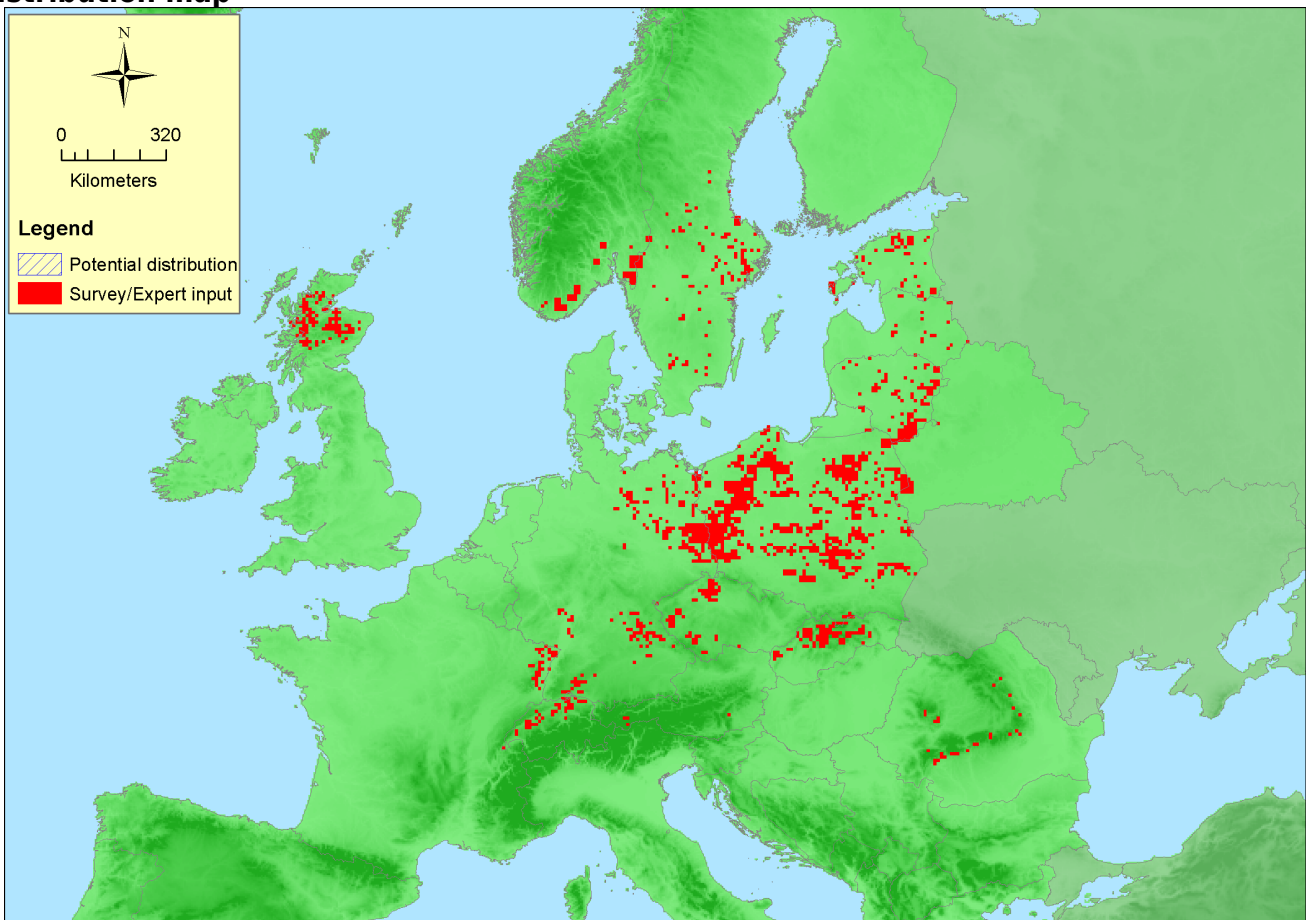


EU 28 +	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
<i>Kaliningrad</i>	Present	Unknown Km <sup>2</sup>	Unknown	Unknown
<i>Norway</i>	Norway Mainland: Present	3455 Km <sup>2</sup>	Decreasing	Decreasing
<i>Switzerland</i>	Present	12 Km <sup>2</sup>	Stable	Decreasing

### 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>	3038400 Km <sup>2</sup>	1548	>8144 Km <sup>2</sup>	Current estimated Total Area cannot be provided because of missing data from some countries. The figure represents the minimum area of occurrence.
<i>EU 28+</i>	3038400 Km <sup>2</sup>	1632	>11611 Km <sup>2</sup>	Current estimated Total Area cannot be provided because of missing data from some countries. The figure represents the minimum area of occurrence.

### Distribution map



The map is rather complete. Data sources: EVA, Art17, ETS.

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

About 30% (the main range of this type is in Belarus, Ukraine and Russia) of the habitat type lies within the EU 28.

## Trends in quantity

The extent of this habitat tends to be stable in the northern part of its geographic range and in mountainous areas. In contrast, it tends to decline in the lowland areas of Central Europe.

- 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 not undergone a major regression.

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

No

*Justification*

The habitat has a large range, but a small area of occupancy within this range.

## Trends in quality

Large areas of this habitat (about 86%) have been affected by degradation, which is on average moderate, in places slight, in other places severe. Across most of its range this habitat type is decreasing in quality, though in some areas, especially in the Alps, it can be stable. Severe degradation and decrease in quality is more common especially in areas affected by nitrogen deposition, in the lowlands and in the southern part the habitat's range. To a large extent, the decrease in quality is probably related to eutrophication due to atmospheric nitrogen accumulation. Increased nitrogen availability results in the spread of nutrient-demanding, often invasive and competitively strong plant species, which tend to outcompete oligotrophic, competitively weak species of the herb layer that are typical of this habitat. An example of a subtype that has experienced severe decline in quality is the lichen-rich pine forests in the Central European lowlands (e.g. in Poland, Annex I type 91T0 Central European lichen Scots pine forests), which are losing their formerly rich synusiae of terricolous macrolichens, partly perhaps due to nutrient enrichment, but the increase in winter temperatures can also be responsible.

- Average current trend in quality

EU 28: Decreasing

EU 28+: Decreasing

## Pressures and threats

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There are various threats affecting this habitat, including forestry management such as logging and conversion to forestry plantations, extraction of sand or stone, development of infrastructure, eutrophication, natural succession and forest grazing.

### List of pressures and threats

#### **Sylviculture, forestry**

Forest and Plantation management & use

Grazing in forests/ woodland

#### **Mining, extraction of materials and energy production**

Mining and quarrying

#### **Pollution**

Nutrient enrichment (N, P, organic matter)

## Conservation and management

The conservation measures suggested to protect this habitat include protection of existing stands, application of nature-friendly forestry management, and continuation of historical management in places where these forests are a legacy of past management.

### List of conservation and management needs

#### Measures related to forests and wooded habitats

Adapt forest management

### Conservation status

Annex I:

9060: BOR U2

91C0: ATL U2

91T0: ALP XX, ATL U2, BOR U2, CON U2, PAN U2

91U0: CON U2

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

After major disturbance, this habitat can regenerate through natural succession within 20-30 years. No intervention is needed.

### Effort required

20 years
Naturally

## Red List Assessment

### Criterion A: Reduction in quantity

Criterion A	A1	A2a	A2b	A3
EU 28	-3 %	Unknown %	Unknown %	Unknown %
EU 28+	-3 %	Unknown %	Unknown %	Unknown %

Based on country assessments done by national experts, this habitat is considered to have undergone approximately 3% reduction in quantity over the last 50 years. There is no available information on historic or future reductions and this habitat is therefore assessed as Least Concern under Criterion A.

### 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>	Yes	Unknown	Unknown	>50	Yes	Unknown	Unknown	Unknown
EU 28+	>50000 Km <sup>2</sup>	Yes	Unknown	Unknown	>50	Yes	Unknown	Unknown	Unknown

Taking into account the large geographic distribution of this habitat, it is assessed as Least Concern under

Criterion B. There is a continuing decline in abiotic and biotic quality. The number of locations was not calculated and is therefore unknown. Data source: Art17 excl. FI + EVA CH UA.

**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	66 %	42 %	Unknown %	Unknown %	Unknown %	Unknown %
EU 28+	66 %	43 %	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%

Summarizing estimates provided by national experts revealed that there has been a slight decline in quality of ca. 42-43% severity affecting approximately 66% of the extent of this habitat in the last 50 years, which is close to the threshold for Vulnerable. This habitat is therefore assessed as Near Threatened under Criterion C/D1. There is no available information on historic or future trends in the quality of this habitat.

**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, and it is therefore assessed as Data Deficient under Criterion E.

**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	NT	DD	DD	DD	DD	DD	DD	DD	DD	DD
EU28+	LC	DD	DD	DD	LC	LC	LC	NT	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
Near Threatened	C/D1	Near Threatened	C/D1



## **Confidence in the assessment**

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

## **Assessors**

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19/02/2016

## **References**

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Schaminée, J.H.J., Chytrý, M., Hennekens, S., Jiménez-Alfaro, B., Mucina, L. and Rodwell, J.S. 2013. *Review of EUNIS forest habitat classification, Report EEA/NSV/13/005*. European Environment Agency, Copenhagen, DK.