G3.Db Picea mire woodland

Summary

This habitat comprises *Picea abies* woodland on shallow to deep peats and peaty mineral soils sustained by high ground water in gentle depressions on plains, on river terraces and at the margins of treeless mires throughout the boreal and more locally in the nemoral zones. An uneven age structure among the trees is characteristic of natural sites but tree cover can be sparse with low-growing individuals when the associated flora is very similar to the open bog or fen surface while, under more closed canopies, shade-tolerant species prevail. Sometimes *Abies alba* is (co-)dominant in more minerotrophic conditions and other trees can occur. The field layer has dwarf shrubs, peat-forming *Sphagna*, big pleurocarpous mosses on drier hummocks, in more mesotrophic conditions, herbs and graminoids and, where there are trickles of moving water, semi-aquatic plants. Drainage of peatlands, forest cuttings, eutrophication due to pollution, infrastructure development and climate change continue to be the main pressures. Protected areas, maintenance of hydrology and improved forestry are conservation needs.

Synthesis

The habitat is assessed as Endangered under criterion A1 in the EU 28, as there has been a 51% decline in its quantity within the last 50 years. However, the area of the habitat is currently stable, as drainage of new peatland sites for forestry is not practiced any more in Northern Europe. There has also been a slight decline in the quality of this habitat, affecting 33% of its extent in the EU 28 in the last 50 years. The habitat quality continues to decrease in most EU 28 countries. Trend data on reduction in quantity were missing from Austria, Latvia, Lithuania, Norway and Serbia. Trend data on reduction in quality was missing from Austria, Estonia, Italy, Latvia, Lithuania, Norway, Poland, Serbia and Slovakia. Six of the countries (including Norway) reported their data of this type combined with the type G3.Db Pinus mire woodland. This habitat type is assessed as Data Deficient at the EU 28+ since a relatively large part of its area may lie within Norway, but precise values are unknown due to the combination of this habitat type with type G3. Db Picea mire woodland. Classification of spruce-dominated peatland forests varies between the countries, and there is a risk that providers of territorial data do not have a common understanding about what kind of habitats are included in this type.

Overall Category & Criteria			
EU 28		EU 28+	
Red List Category	Red List Criteria	Red List Category	Red List Criteria
Endangered	A1	Data Deficient	-

Sub-habitat types that may require further examination

No sub-habitats have been distinguished for further analysis.

Habitat Type

Code and name

G3.Db Picea mire woodland

Picea and *Betula* dominated woodland in the Apa Rosie mire in the Romanian Carpathians (Photo: John Janssen).

Fir forest with *Sphagnum palustre* and *S. flexuosum* on peat (4 m deep) in the western Massif central, France (Photo: Benoît Renaux).

Habitat description

These are coniferous woodlands of shallow to deep peats and peaty mineral soils sustained by high ground water in gentle depressions on plains, on river terraces and at the margins of treeless mires throughout the boreal and more locally in the nemoral zones. Picea mire woodland can occur on ombrotrophic active bog surface on deep peat, but is more often found on minerotrophic peats or on shallower peaty soils at mire margins, though in drier regions being more extensive on the mire surface. Tree cover can be sparse with low-growing individuals when the associated flora is very similar to the open bog or mire surface while, under more closed canopies, shade-tolerant species prevail. An uneven age structure among the trees is characteristic of natural sites. *Picea abies* tends to be the canopy dominant in extensive stands on a hummock-dominated peat surface, or sometimes a more pronounced hummock-hollow micro-topography on the peat surface. Sometimes *Abies alba* is (co-)dominant in more minerotrophic conditions. *Betula pubescens, Pinus sylvestris* and *Salix* spp. are common associates sometimes with *Alnus glutinosa* and *A. incana* admixed in somewhat less oligotrophic situations. *Picea abies* ssp.*obovata* is a dominant subspecies vicariating with *P. abies* ssp*. abies* in northeastern parts of Europe. The field layer has such dwarf shrubs as *Vaccinium myrtillus, V. vitis-idaea, V. uliginosum, V. oxycoccos, Ledum palustre, Chamaedaphne calyculata*, with herbs and sedges like *Melampyrum pratense, Rubus chamaemorus, Eriophorum vaginatum, Carex globularis* as well as peat-forming *Sphagna* like *S. angustifolium, S. centrale, S. girgensohnii, S. palustre, S. magellanicum and S. russowii* with big pleurocarpous mosses on drier hummocks. In more mesothrophic conditions, herbs like *Equisetum sylvaticum, Dryopteris carthusiana, Trientalis europaea,* and graminoids like *Calamagrostis purpurea, Carex canescens and Carex loliacea* are common. Trickles of moving water can even sustain species such as *Calla palustris, Menyanthes trifoliata, Equisetum fluviatile, E. palustre* and *Comarum palustre.*

Indicators of quality:

- No forest exploitations.

- Intact natural mire hydrology.

- Natural composition of canopy with dominant Picea spp.

- Structural diversity/ -complexity with (semi)natural age structure or completeness of layers.

- 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.

- Absence of non-native species in all layers (flora and fauna).

- No signs of eutrophication or pollution.

Characteristic species:

Tree canopy: *Picea abies, Abies alba, Betula pubescens, Alnus incana, A. glutinosa, Frangula alnus.*

Field layer: *Vaccinium myrtillus, V. vitis-idaea, Vaccinium uliginosum, V. oxycoccos, Ledum palustre, Chamaedaphne calyculata, Calluna vulgaris, Empetrum nigrum, Calamagrostis purpurea, Carex canescens, C. globularis, C. loliacea, C. nigra, Andromeda polifolia, Equisetum sylvaticum, Dryopteris carthusiana, Melampyrum pratense, Drosera rotundifolia, Rubus chamaemorus, Trientalis europaea.*

Bryophytes: *Sphagnum capillifolium, S. centrale, S. fallax, S. flexuosum, S. palustre, S, magellanicum, S. girgensohnii, S. russowii, S. squarrosum, Dicranum majus, Polytrichum commune, P. strictum, Mylia anomala, Aulacomnium palustre, Barbilophozia lycopodioides.*

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

EUNIS:

G3.D Boreal bog conifer woodland

G3.E Nemoral bog conifer woodland

EuroVegChecklist alliances:

Empetro-Piceion obovatae Morozova *et al.* 2008

Eriophoro-Piceion abietis Passarge 1968

Calamagrostio canescentis-Piceion abietis Solomeshch in Solomeshch et Grigorjev 1992 nom. inval.

Annex I:

91D0 Bog woodland

Emerald:

G3.D Boreal bog conifer woodland

G3.E Nemoral bog conifer woodland

MAES-2:

Woodland and forest

IUCN:

1.1 Boreal Forest

1.4 Temperate Forest

EFT:

11.1 Conifer dominated or mixed mire forests

VME:

D1 Western boreal spruce forests, Boreal and hemiboreal pine forests

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

Justification
This is an azonal habitat type distributed in several biogeographic regions.

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	Present	0-10 Km^2	Unknown	Decreasing
Bulgaria	Present	1.5 Km^2	Decreasing	Decreasing
Czech Republic	Present	100 Km^2	Stable	Decreasing
Estonia	Present	6 Km^2	Increasing	Unknown
Finland	Aland Islands: Present Finland mainland: Present	4,780 Km^2	Decreasing	Decreasing
France	Corsica: Uncertain France mainland: Present	0-80 Km^2	Increasing	Decreasing
Germany	Present	110 Km^2	Decreasing	Decreasing
Italy	Italy mainland: Present Sardinia: Uncertain Sicily: Uncertain	0-16 Km^2	Stable	Decreasing
Latvia	Present	2 Km^2	Decreasing	Decreasing
Lithuania	Present	30-35 Km^2	Decreasing	Decreasing
Poland	Present	0.1 Km^2	Unknown	Unknown
Romania	Present	0-50 Km^2	Decreasing	Decreasing
Slovakia	Present	0-30 Km^2	Decreasing	Unknown
Slovenia	Present	0-11 Km^2	Stable	Decreasing
Sweden	Present	6,380 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)
Bosnia and Herzegovina	Present	10-20 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)
Norway	Norway Mainland: Present	0-2,670 Km^2	Decreasing	Decreasing
Serbia	Present	Unknown Km^2	Unknown	Unknown
Switzerland	Present	22 Km^2	Stable	Decreasing

Extent of Occurrence, Area of Occupancy and habitat area

	Extent of Occurrence (EOO)	Area of Occupancy (AOO)	Current estimated Total Area	Comment
EU 28	>50000 Km^2	>50	> 11420 Km^2	The area is without countries which gave data on G3.D/E only
EU 28+	>50000 Km^2	>50	> 11457 Km^2	The area is without countries which gave data on G3.D/E only

Distribution map
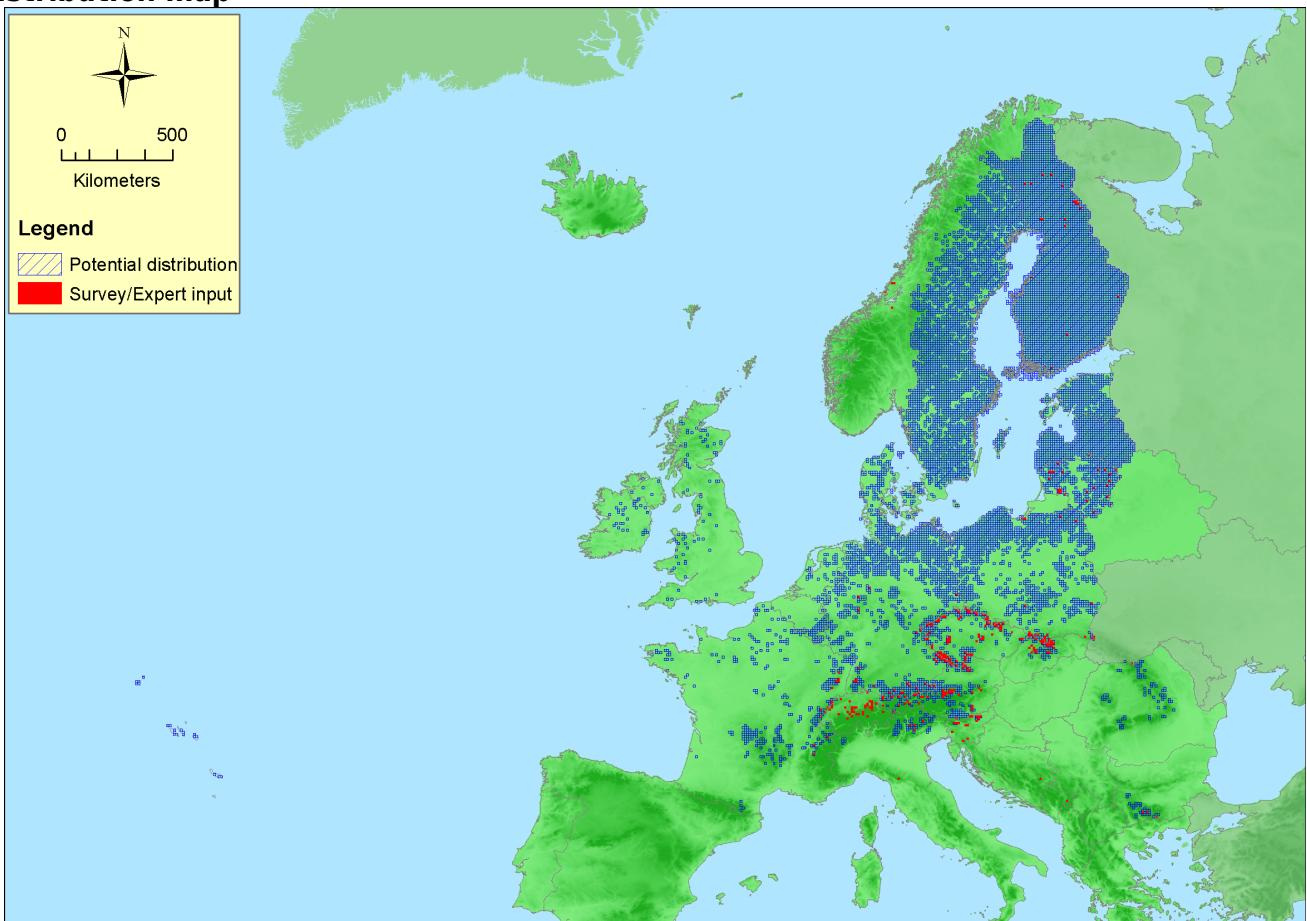
The map is very incomplete, and therefore the potential distribution (based on Annex I type 91D0) is given for the EU. Data sources: EVA, Art17.

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

Less than 50 % of the current distribution of the habitat lies within the EU 28. There are large areas of this habitat in Russia, and the habitat is also present in some other countries outside the EU 28.

Trends in quantity

There was a 51% decrease in the EU 28 region during the past 50 years, calculated with trend data based

on all countries except Austria, Latvia and Lithuania. Calculating trends in quantity for the EU 28+ region was not possible, since trend data were missing from Norway, where a relatively large part of the area of this habitat may lie. The greatest decrease (70%) occurred in Finland, which also has the second largest area of this habitat. The most important reason for the decline by far has been the drainage of peatlands for forestry. There are no historical data from 250-50 years ago. The area of the habitat is currently stable, as new peatland sites are not drained anymore in the Northern Europe.

Austria, Romania, Slovenia, Norway, Slovakia and France have reported this type and G3.Da Pinus mire woodland combined together. For these countries areas above are given in the form 0-total, i.e. assuming that the area could be anything from 0 km^2 to the total reported by the country. Trend calculations for the EU 28 were made using both 0 km^2 and the total reported for these countries. The result did not differ much, since all of these countries except Norway had a very small area of this type.

In the territorial data of some countries it is unclear whether drained mires are included in the reported area or not. For instance, in the territorial data of Sweden the decrease of the area is only 1,2% in the past 50 years, even though it is known that some drainage has occurred during that time period. On the other hand, the territorial data of Finland reports area of undrained mires only, which explains the drastic decline.

- 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 very large area and a wide distribution in Europe.
- Does the habitat have a small natural range by reason of its intrinsically restricted area?
  No
  Justification
  The habitat has a very large area and a wide distribution in Europe.

Trends in quality

In the past 50 years there has been a slight decline (31% relative severity) affecting 33% of the extent of the habitat in the EU 28, calculated based on trend data for all countries except Austria, Slovakia, Italy, Estonia, Latvia, Lithuania and Poland. It was not possible to calculate a qualitative trend for EU 28+, as trend data on habitat quality for Norway was missing, and a relatively large area of this habitat type may occur there. The degradation of this habitat type has been both abiotic and biotic. The most important reasons for the decline in quality have been drainage of peatlands for forestry and forest cuttings. The current trend is decreasing in most countries, and it is possible that in the future climate change will also have negative effects on the quality of this habitat.

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

Pressures and threats

Drainage of peatlands for forestry, forest cuttings, eutrophication due to pollution (especially on ombrotrophic and oligotrophic sites), infrastructure development and climate change are the main threats to this habitat. However, in many countries ditching of hydrologically intact peatland sites is not practiced any more. Stands of this habitat type are usually more intensively managed by forestry than those of the habitat G3.Da Pinus sylvestris mire woodlands, but there is not much scientific knowledge available on

development of peatland ecosystems with developing secondary stands after clear-cutting. The influence of climate change is likely to increase in the future.

List of pressures and threats

Sylviculture, forestry

> Forestry clearance
> Removal of dead and dying trees
> Thinning of tree layer

Forestry activities not referred to above

Transportation and service corridors

> Roads, motorways

Pollution

> Nitrogen-input

Natural System modifications

> Other human induced changes in hydraulic conditions

Climate change

> Temperature changes (e.g. rise of temperature & extremes)
> Habitat shifting and alteration

Conservation and management

The most common approaches currently involve establishing protected areas/sites, establishing wilderness areas, restoring/improving habitats, usually by restoring hydrological conditions, and adapting forest management. Some of the additional actions needed include further optimizing the use of funds for conservation (what kind of areas are chosen for conservation and where), further improving methods for conservation/nature management in managed forests (e.g. regarding deadwood), adaptation of spatial planning (roads, etc.), and bringing climate change under control.

List of conservation and management needs

Measures related to forests and wooded habitats

Restoring/Improving forest habitats
Adapt forest management

Measures related to wetland, freshwater and coastal habitats

Restoring/Improving the hydrological regime

Measures related to spatial planning

Establish protected areas/sites
Establishing wilderness areas/allowing succession

Conservation status

Annex I:

91D0: ALP FV, ATL U2, BOR U1, CON U1, MAC U1, PAN U1

When severely damaged, does the habitat retain the capacity to recover its typical

character and functionality?

The habitat has the potential to recover, but recovery will be very slow. It always requires restoration of hydrological conditions.

Effort required

50+ years	200+ years
Through intervention	Naturally

Red List Assessment

Criterion A: Reduction in quantity

Criterion A	A1	A2a	A2b	A3
EU 28	51 %	Unknown %	Unknown %	Unknown %
EU 28+	Unknown %	Unknown %	Unknown %	Unknown %

During the past 50, there has been a 51% reduction in the quantity of this habitat in the EU 28 based on territorial data. The habitat is therefore assessed as Endangered under criterion A1. Data on quantitative trends in Austria, Latvia, Lithuania, Norway and Serbia are missing. A relatively large area of this habitat type may lie within Norway. Therefore, the habitat is assessed as Data Deficient under criterion A in the EU 28+ region. There is no information on future or historic reductions for this habitat type.

Criterion B: Restricted geographic distribution

Criterion B	B1				B2				B3
	EOO	a	b	c	AOO	a	b	c	
EU 28	>50,000 Km^2	Yes	Unknown	Unknown	>50	Yes	Unknown	Unknown	No
EU 28+	>50,000 Km^2	Unknown	Unknown	Unknown	>50	Unknown	Unknown	Unknown	No

This habitat is very widely distributed and occupies a very large area in numerous locations. Its extent of occurrence (EOO) is larger than 50,000 km^2, and its area of occupancy (AOO) is larger than 50. Therefore it is assessed as Least Concern under criterion B.

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	33 %	31 %	Unknown %	Unknown %	Unknown %	Unknown %
EU 28+	Unknown %	Unknown %	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%

In the past 50 years, 33 % of the habitat area in the EU 28 was affected by a slight reduction in quality (31% relative severity), and the habitat is therefore assessed as Least Concern under criteria C/D1. The type of quality degradation usually was both abiotic and biotic. A majority of the area with reduced quality was affected with slight severity. Trend data of qualitative degradation were missing in Austria, Estonia, Italy, Latvia, Lithuania, Norway, Poland, Serbia, and Slovakia. A relatively large part of the area of this type may lie within Norway, and this habitat is, therefore, assessed as Data Deficient under Criterion C/D in EU 28+.

Criterion E: Quantitative analysis to evaluate risk of habitat collapse

Criterion E	Probability of collapse
EU 28	Unknown
EU 28+	Unknown

There is no analysis available of the probability of collapse of this habitat, which 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	EN	DD	DD	DD	LC	LC	LC	LC	DD	DD	DD	DD	DD	DD	DD	DD	DD
EU28+	DD	DD	DD	DD	LC	LC	LC	DD	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
Endangered	A1	Data Deficient	-

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

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Date of assessment
21/12/2015

Date of review
11/05/2016

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