

G1.5 Broadleaved bog woodland on acid peat

Summary

Broadleaved swamp woodland on acid peat, typically dominated by a rather open cover of *Betula pubescens*, can be found all over Europe, except in the Mediterranean zone, occurring on active lowland bogs and transition mires. The trees cast relatively light shade and the associated flora includes a contingent of bog species as well as more shade-tolerant plants typical of wet nutrient-poor conditions. Stands across most of the range are mostly small and isolated and the habitat covers large areas only in the Boreal and north Continental zones, particularly in Finland and Sweden. The habitat depends on the maintenance of natural hydrographic conditions and has been widely affected by drainage, peat cutting, water pollution and shifts to other land use, notably forestry. Such a delicate habitat is difficult to reclaim without an ability to restore hydrographic integrity.

Synthesis

The VU category is attained because of the reduction in quantity during the last 50 years, especially in Finland. Even if the area outside Finland and Sweden is much smaller, most other countries reports a similar decline. We lack data for Sweden, and a trend in quantity can only be calculated on about 60% of the area in EU28 and 28+. Even so, we assume that the trend in Sweden must not be good enough to improve the average trend and make it go below the 30% decline required to qualify the VU category.

Overall Category & Criteria			
EU 28		EU 28+	
Red List Category	Red List Criteria	Red List Category	Red List Criteria
Vulnerable	A1	Vulnerable	A1

Sub-habitat types that may require further examination

Western Atlantic types of this habitat are rarer and smaller in extent than Boreal ones, and have suffered greatly within longer historic times from reclamation and land-use changes. They could thus can be more threatened than others, though the level of protection in particular countries may be higher.

Habitat Type

Code and name

G1.5 Broadleaved bog woodland on acid peat



Birch forest on acid peat in the Ardennes, Belgium (Photo: John Janssen).



Birch forest on acid peat with *Eriophorum vaginatum* in Witterveld, Netherlands (Photo: John Janssen).

Habitat description

This habitat is broadleaved deciduous woodland on wet acid, oligotrophic peat on the surfaces of bogs or transition mires, around pools and along lags throughout the Atlantic and into the Boreal zones; more locally, where ground water conditions permit, it occurs also in the Continental zone. The woodland is typically dominated by *Betula pubescens*, the canopy is often only a few metres tall and the trees sometimes have a naturally decrepit appearance, infected early with *Piptoporus*. *Alnus glutinosa* is generally excluded from the canopy because of nutrient shortage. There is never more than a minority component of conifers, though *Pinus sylvestris* increasingly replaces *Betula* as the dominant in similar situations in the colder Boreal zone and as a pioneer species in Massif central. Deciduous woody associates, such as shrubby *Salix* spp. and *Frangula alnus* can occur, though typically at low cover and never forming an extensive understorey. The field layer generally shows strong continuity with the adjacent bog vegetation and can be quite luxuriant but more shade-tolerant species gain the ascendancy under the birch canopy, sometimes producing a rather species-poor cover of, for example, tussocks of *Molinia caerulea*. The often extensive carpets of *Sphagnum* on lower wetter ground between the trees include some distinctive species such as *S. fimbriatum* and *S. russowii*. Only naturally developed stands should be included here (primary stands and secondary stands due to older/ former changes in hydrology) and drying or cut-over bogs onto which *Betula* and other tree species spread in the past should be considered as poorer-quality examples of bog forests. Young succession stages or stages without stabilized hydrology are not considered under this type.

Indicators of quality:

- Intact (semi)natural hydrology
- Absence of forest exploitation
- Typical structure and composition of canopy with an open or patchy cover with dying and keeling birch trees are natural
- Typical flora and fauna composition of the region, especially a field layer typical of wet acid peat without any indication of drying, eutrophication or pollution, for example the overwhelming spread of *Molinia caerulea*
- Absence of non-native tree species and absence of invasive aliens in all layers (fauna, flora), such as conifers or non-native *Rhododendron* such as happens where bogs have been drained.

Characteristic species:

Tree canopy: *Betula pubescens*, *Alnus glutinosa* (rare), *Frangula alnus*, *Pinus sylvestris*.

Understorey, field layer: *Sorbus aucuparia*, *Salix aurita*, *S. cinerea*, *Molinia caerulea*, *Erica tetralix*, *Carex laevigata*, *Vaccinium myrtillus*, *V. uliginosum*, *V. oxycoccos*, *Andromeda polifolia*, *Dryopteris dilatata*, *Eriophorum vaginatum*, *Juncus effusus*, *Deschampsia flexuosa*. Mosses: *Mnium hornum*, *Sphagnum palustre*, *S. fimbriatum*, *S. magellanicum*, *S. papillosum*, *S. fallax*, *S. flexuosum*, *S. angustifolium*, *Polytrichum commune*, *P. strictum*, *Aulacomnium palustre*, *Tomentypnum nitens*.

Classification

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

EUNIS:

G1.5 Broadleaved swamp woodland on acid peat

EuroVegChecklist alliances:

Sphagno-Betulion pubescentis Passarge 1968

Pleurozio-Betulion pubescentis Passarge 1968

Annex 1:

91D0 Bog woodland

(parts may be assigned under 7120 Degraded raised bogs still capable of natural regeneration)

Emerald:

G1.51 Sphagnum Betula woods

MAES:

Woodland and forest

IUCN:

1.1 Boreal Forest

1.4 Temperate Forest

EFT:

11.3 Birch swamp forest

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

No

Justification

This is an azonal type across most of its range.

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	1 Km ²	Unknown	Unknown
<i>Belgium</i>	Present	7.5 Km ²	Increasing	Increasing
<i>Bulgaria</i>	Uncertain	unknown Km ²	Unknown	Unknown
<i>Croatia</i>	Present	Fragments Km ²	Unknown	Unknown
<i>Czech Republic</i>	Present	18 Km ²	Decreasing	Decreasing
<i>Denmark</i>	Present	47 Km ²	Unknown	Decreasing
<i>Estonia</i>	Present	unknown Km ²	Unknown	Unknown
<i>Finland</i>	Aland Islands: Uncertain Finland mainland: Present	1513 Km ²	Decreasing	Decreasing
<i>France</i>	France mainland: Present	30 Km ²	Increasing	Increasing
<i>Germany</i>	Present	200 Km ²	Decreasing	Decreasing
<i>Ireland</i>	Present	1 Km ²	Unknown	Decreasing
<i>Italy</i>	Italy mainland: Present	unknown Km ²	Decreasing	Decreasing
<i>Latvia</i>	Present	unknown Km ²	Decreasing	Decreasing
<i>Lithuania</i>	Present	200 Km ²	Stable	Decreasing

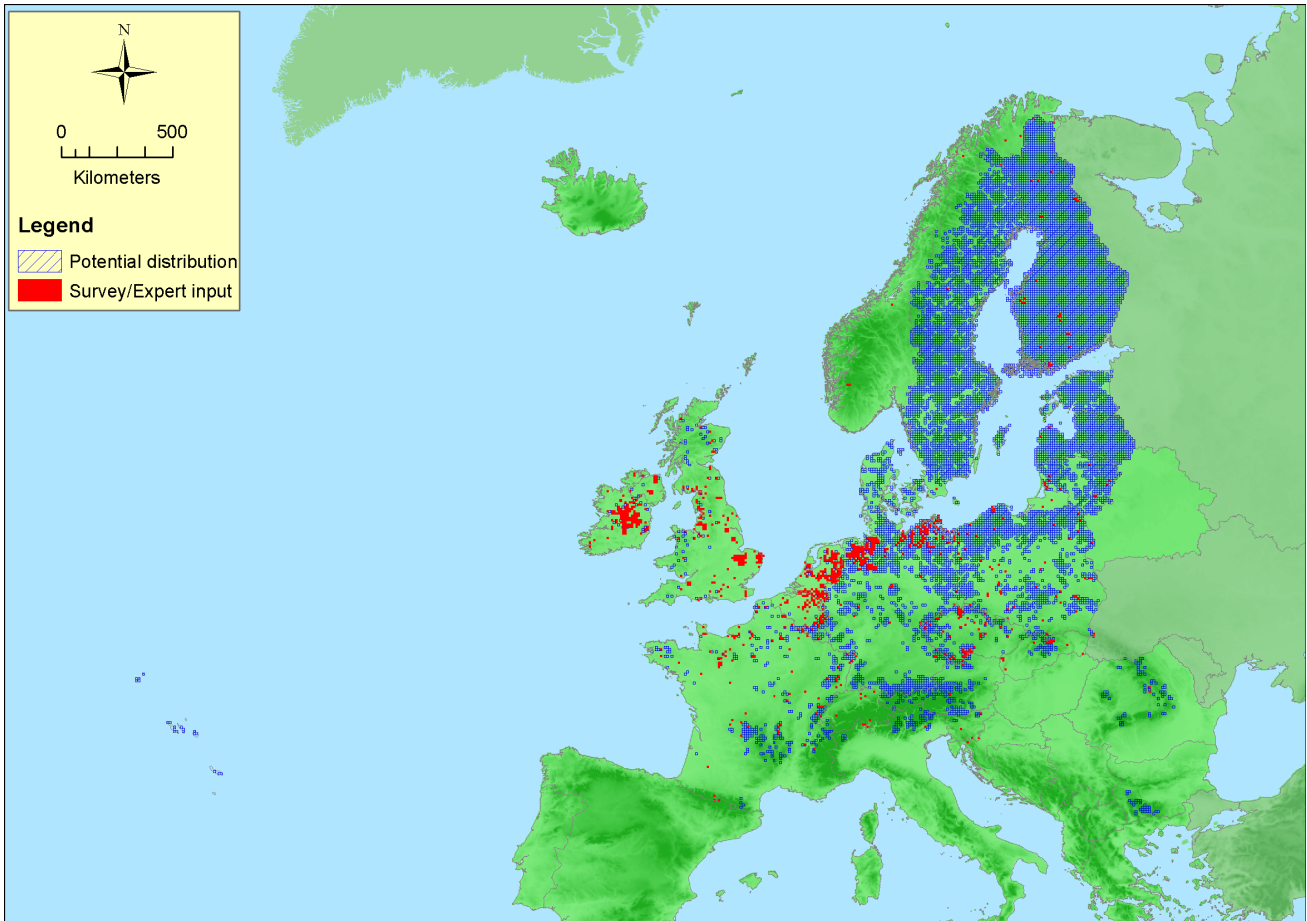
EU 28	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
<i>Luxembourg</i>	Uncertain	Km ²	-	-
<i>Netherlands</i>	Present	17 Km ²	Increasing	Increasing
<i>Poland</i>	Present	unknown Km ²	Unknown	Unknown
<i>Romania</i>	Uncertain	unknown Km ²	Unknown	Unknown
<i>Slovakia</i>	Present	5.7 Km ²	Decreasing	Unknown
<i>Slovenia</i>	Present	0.03 Km ²	Decreasing	Unknown
<i>Sweden</i>	Present	Unknown Km ²	Unknown	Unknown
<i>UK</i>	Northern Island: Present United Kingdom: Present	50 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	0.2 Km ²	Decreasing	Decreasing
<i>Kaliningrad</i>	Present	unknown Km ²	Unknown	Unknown
<i>Norway</i>	Norway Mainland: Present	unknown Km ²	Unknown	Unknown
<i>Serbia</i>	Uncertain	unknown Km ²	Unknown	Unknown
<i>Switzerland</i>	Present	3 Km ²	Decreasing	Unknown

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>	8713550 Km ²	12648	3500 Km ²	AOO and EOO incl. potential distribution
<i>EU 28+</i>	8847300 Km ²	12667	3550 Km ²	AOO and EOO incl. potential distribution

Distribution map



Map is incomplete and therefore the potential distribution for the EU is given, with remaining data gaps in the Balkan. Data sources: Art17, EVA, BOHN, ETS.

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

The area of EU 28+ is very close to EU28, because only a few km² lie in Norway, Switzerland or other countries. Concerning the Area in Europe outside EU 28, hundreds or thousands km² must lie in Russia, Bielorussia and Ukraine. A rough estimate of 25 % of the current area must lie in EU 28, depending on the area in Russia.

Trends in quantity

The long-term historical trend in quantity (last 200 yrs) is unknown in many countries, especially Finland and Sweden where most of the current extent lies. An increase is reported in some countries of Western Europe (France, the Netherlands) due to agricultural decline (former grazed wetlands abandoned and recolonized by willows, alders and birches). A decline is reported in other countries (Belgium, Germany, Switzerland), possibly because of wetlands drying-out or forest conifers planting.

More data are available for the recent past, and a decrease is reported in most countries, especially Finland (40 to 50 decrease), in the Czech Republic and Germany, with about -40%. Slovakia, Slovenia and Switzerland also report a -11 to -25% decline. The reported trend in France and the Netherlands is the same for the last 200 years. No trend is reported for Sweden (where an area similar to Finland can be found, according to Article 17 2007-2012 reporting), Austria, Belgium, Bulgaria, Croatia, Denmark, Estonia, Ireland, Norway, Poland, Romania and the UK (where smaller areas can be found).

The average recent past trend is a 40% decline in EU 28 and 28+, mostly due to the situation in Finland where most of the area lie.

The current trend must be much more closer to stability, but still slightly decreasing according to the

situation in Finland. The average current trend for EU 28 and 28+ depends a lot on the situation in Sweden for which there are no data but where the Article 17 category 2007-2012 was better than in Finland and a stable trend has been reported. Bosnia and Herzegovina, France, Germany, Italy, Latvia, Slovakia and Slovenia report a decrease, Belgium and Lithuania an increase, and Czech Republic, the Netherlands, Switzerland and the UK a stable current trend. The impact of nature conservation programs has sometimes been positive but can also be negative, as the clearing of Broadleaved swamp woodlands has been reported on many sites in France in favor of non-wooded habitats.

- 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 large EOO and AOO.

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

No

Justification

In part of the range the habitat may have intrinsically small areas, but especially in Scandinavia the habitat may form large stands.

Trends in quality

No historical trend can be assessed as no data were provided but most countries report a recent-past decline in quality, except France and the Netherlands because of aging of young stands that have recolonized former agricultural lands since early-mid 20th century. Today, Belgium and the Netherlands are the only countries to report an increase in quality, due to nature conservation measures. The impact of nature conservation programs can sometimes be negative, and the grazing (or even clearing) of this habitat has been reported on many sites in France.

- Average current trend in quality

EU 28: Decreasing

EU 28+: Decreasing

Pressures and threats

Modification of hydrographic functioning by drainage is reported by all countries as one of the first threats, except in Slovenia. Water abstraction from groundwater is reported by Belgium, with more or less the same effects. Forestry and especially clearance (less often thinning, logging, or plantation of alien species) is cited in half of the countries. Eutrophication, mostly because of nitrogen deposits, is reported in several cases (Belgium, Czech Republic, Denmark, Slovakia, Slovenia, Switzerland, the UK).

Though reported in few countries (Finland and Ireland) peat extraction could destroy important surfaces too, especially in boreal zone. Other rarely cited threats are damage by herbivores (game species), competition by other exotic species than trees (*Rhododendron* in the UK) and "missing or wrongly directed conservation measures". The exact meaning of this is not explained in Belgium, but the clearance of most wooded bogs in protected areas as been reported for Article 17 in France, as no balance is sought between open and wooded habitats. Indeed, wooded bogs only represent between 5 and 10% of the peatlands area in Massif central for example, mostly because of the grazing and cutting of trees in the case of swamp woodland on acid peat (for other woodlands on peat, especially raised bogs ones, trees are often naturally absent due to natural conditions).

Climate change has also been reported but surprisingly in few countries and is only the 5th cited threat,

after vegetation succession. such evolution to more mature and shade tolerant forest types is natural but it would be quickened by climate change.

List of pressures and threats

Sylviculture, forestry

- Forest and Plantation management & use
 - Forest replanting
 - Forestry clearance

Mining, extraction of materials and energy production

- Peat extraction

Pollution

- Air pollution, air-borne pollutants
 - Nitrogen-input

Natural System modifications

- Modification of hydrographic functioning, general
 - Water abstractions from groundwater

Climate change

- Changes in abiotic conditions
 - Temperature changes (e.g. rise of temperature & extremes)
 - Droughts and less precipitations

Conservation and management

On damaged sites, the restoration of the abiotic and biotic condition is the most important approach in peatland conservation. This means good water supply in quantity by filling or putting dams on the drains, and also dealing with water quality. An increase of the water level with a bad quality water could completely damage the habitat, with very few chances to restore an oligotrophic vegetation. On a lot of sites, broadleaves swamp woodland on acid peat occurs on the wetter part of the bog, and water can come from the surroundings : the water supply should be protected from pollution, due for example to agriculture. Conservation measures cannot apply only on the bog itself but must also cover the surroundings. Extensive agriculture with no fertilization or forestry without large clearcuts (to protect soils and hydrological functioning) are possible measures. Changes on hydrology outside the site can also have important effects.

Grazing has to be prohibited because of regeneration problems and destruction of the *Sphagnum* layer. Even where the habitat covers large surfaces, a restoration of the hydrological conditions followed by strict protection (no forestry nor agriculture use) seems appropriate, because forestry on such wet soils implies drainage, and is not compatible with the habitat conservation. This approach is even more important in area where the habitat is rare (south-western part of the distribution area), and rare remaining sites have to be strictly protected.

List of conservation and management needs

Measures related to forests and wooded habitats

- Restoring/Improving forest habitats

Measures related to wetland, freshwater and coastal habitats

Restoring/Improving water quality
Restoring/Improving the hydrological regime

Measures related to spatial planning

Establish protected areas/sites
Legal protection of habitats and species

Measures related to special resource use

Regulating/Management exploitation of natural resources on land

Conservation status

Annex I:

91D0: ALP FV, 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 main intervention is to restore hydrological functioning of the habitat, both in quality and quantity. Species will be able to recolonize and planting is not necessary most of the time. Alien species (eg. *Picea abies* outside its natural range) must be removed. During late 20th - early 21st centuries, the restoration of former wet grasslands has been systematically chosen in some areas, and no balance between open land and wooded habitats was sought. Both habitat types deserves to be conserved, and a balance has to be found.

Effort required

50+ years
Through intervention

Red List Assessment

Criterion A: Reduction in quantity

Criterion A	A1	A2a	A2b	A3
EU 28	-41 %	unknown %	unknown %	unknown %
EU 28+	-41 %	unknown %	unknown %	unknown %

The average recent past trend is a 41% decline in EU 28 and 28+, mostly due to the situation in Finland where most of the area lie. This trend would lead to the VU category but can only be calculated across about 60% of the extent, due to the complete lack data from Sweden (the area of the habitat in Sweden is close to its area in Finland according to Article 17). Even if the situation seems better in Sweden (according to the Article 17 2007-2012 assessment), the decline in reported countries seems strong enough to assume a 30 to 50 % decline in the whole EU 28 and 28+. Indeed, only a small decline (7,5 %) in Sweden would lead to give a 30% decline in EU 28 and 28+. A stable trend in Sweden would for example give a 26 % decline in EU 28 and 28+, a 15 % decline would give -32%, etc.)

Criterion B: Restricted geographic distribution

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

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

The EOO, AOO and number of locations exceed the thresholds for assessment under this criterion.

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	55 %	36 %	unknown %	unknown% %	unknown %	unknown% %
EU 28+	55 %	36 %	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%

As the trend in quantity, the trend in quality can only be calculated on about 60% of the area because there is no data for Sweden. A slight decline (36%) affecting more than half of the area (55%) could only qualify the NT category, and the better trend in Sweden (according to art. 17 report) is likely to ameliorate the global trend for EU 28 and 28+. The VU category (qualified for the past-present trend in quantity) would not probably be reached with Sweden.

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	VU	DD	DD	DD	LC	LC	LC	NT	DD	DD	DD	DD	DD	DD	DD	DD	DD
EU28+	VU	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
Vulnerable	A1	Vulnerable	A1

Confidence in the assessment

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

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