G1.4 Broadleaved swamp woodland on non-acid peat

Summary

These are true swamp woodlands on non-acid peat or hydromorphic soils with a high content of organic matter occurring mainly in lowland fens where the water-table is constantly at ground level or seasonally above it, but where is no regular deposition of allochthonous sediments, hindering enrichment and terrestrialisation. There is characteristically a well-developed tree canopy, usually dominated by *Alnus glutinosa*, a shrubby understorey and a field layer often with big tussocky sedges. Significant pressures are changes in catchment or local hydrology, often linked to land-use shifts to agriculture and forestry, as well as pollution and eutrophication of waterbodies, regionally also invasive species or diseases. Restoring the natural hydrology and reducing all kinds of pollution and eutrophication sources are vital to conservation.

Synthesis

The habitat is Vulnerable, because of a reduction in quantity of 34 % (EUR28) and an assumed reduction of >30% in EUR28+ (for EUR28+ a reassessment with more data is recommended). Furthermore an intermediate reduction in quality over almost 2/3 of its area supports the assessment Vulnerable under criterion C/D1. Because of large EOO and AOO all other criteria are least concern. Assessment of long-term historic trends was not possible due to data deficiencies. With a strict and more consistent application of quality indicators an even larger area would be at least slightly affected.

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

There are subtypes where the threat status could differ significantly: *Alnus incana* swamp woodland is much rarer and has a smaller range and distribution, but it replaces azonal *Alnus glutinosa* swamp woodlands mainly in cold climates, where pressures might be less. Definitely much more long-term historic losses occurred in the alder carrs typical for large lowland river valleys on the side depression of the valleys, outside the regular inundation zone. These ocurrences have often been drained or the hydrology completely modified very early and are nowadays mostly urbanized or transport axes. (Sub)Atlantic subtypes of *Alnus glutinosa* are probably more highly threatened than the (sub) continental ones.

Habitat Type

Code and name

G1.4 Broadleaved swamp woodland on non-acid peat

G1.4 Broadleaved swamp woodland on non-acid peat, *Thelypterido-Alnetum glutinosae*, Vechtplassen, Netherlands (Photo: John Janssen).

G1.4 Broadleaved swamp woodland on non-acid peat, *Alnus glutinosa* with high groundwater table, Jasmund, Germany (Photo: Axel Ssymank).

Habitat description

These are true swamp woodlands on non-acid peat or hydromorphic soils with a high content of organic matter occurring mainly in lowland fens where the water-table is constantly at ground level or seasonally above it, for example where sites are inundated by spring snow-melt or rain-fed flooding. However, in contrast to the woodlands of mature floodplains included in G1.2 and G1.3, there is no regular deposition of allochthonous sediments, so enrichment and terrestrialisation typically do not occur here though intermediate habitats can be found in wetter river valleys. There is characteristically a well-developed tree canopy in which, throughout most of the nemoral zone, *Alnus glutinosa* is the usual dominant, often with a naturally multi-stemmed growth form, *Quercus robur* replacing it locally in the more Continental east and *Populus tremula* in the Boreal zone. On thin peats in Boreal swamps of the Finnish coast and archipelago and in regions in central Europe where *Alnus glutinosa* is missing, *Alnus incana* can replace *A. glutinosa* in this swamp woodland. Also the dense *Alnus barbata* forests on swamps on coastal alluvial plains around the Black Sea belong here. *Betula pubescens* is a common associate but never dominates. Shrubby willows such as *Salix aurita*, *Salix cinerea* and *Salix pentandra* can occur in an understorey, along with other smaller woody species listed below, but they do not dominate here. Shrubby vegetation (with or without occasional trees) developed in similar situations are placed in F9.2 and F9.3 Riparian scrubs. In the field layer, large *Carex* spp. are a consistent and sometimes prominent feature, with *C. elongata* typical through much of central Europe, *C. laevigata* and *C. paniculata* replacing it towards the Atlantic zone. The associated flora throughout can be rich with large graminoids, tall herbs and sprawlers, including many typical fen species, and a carpet of bryophytes tolerant of more shady wet habitats. In Boreal and Euxinic stands, the associated flora has some distinctive herbs. In other stands, alders and huge sedge tussocks can dominate in much more species-poor swamp with much bare peat and open water.

Indicators of quality:

- No forest exploitation or only very limited signs of forestry
- Intact natural hydrology: maintenance of high groundwater table and no signs of drying of the peat or water-logged soil
- Typical structure and composition of canopy: dominance must always ultimately lie with vigorously growing trees rather than the associated shrubs
- Presence of old trees and a variety of dead wood (lying and standing) and the associated flora, fauna and fungi
- Presence of natural disturbance such as treefall openings with natural regeneration
- Structural diversity/complexity with (semi)natural age structure or completeness of layers
- Regional variation in the associated flora of this essentially azonal habitat is low but such distinctive

typical flora and fauna species as are characteristic should persist.
- Absence of non-native tree species and absence of invasive aliens in all layers (fauna and flora),
- Absence of species indicative of drying of the peat or the wet soil conditions or of excessive eutrophication and no signs of pollution

Charactersitic species:

Tree canopy: *Alnus glutinosa*, *Betula pubescens*, *Frangula alnus*, *Fraxinus excelsior*, *Sorbus aucuparia* and *Quercus robur*;

Understorey/field layer: *Viburnum opulus, Prunus padus*, *Salix cinerea*, *S. aurita*, *S. pentandra*, *Rubus fruticosus* agg., *Lysimachia vulgaris*, *Solanum dulcamara*, *Lycopus europaeus*, *Urtica dioica*, *Galium palustre*, *Iris pseudacorus*, *Calla palustris*, *Carex elongata*, *C. laevigata*, *C. paniculata*, *C. acutiformis*, *C. elata*, *Calamagrostis canescens*, *Lythrum salicaria*, *Deschampsia cespitosa*, *Peucedanum palustre*, *Filipendula ulmaria*, *Juncus effusus*, *Cirsium palustre*, *Caltha palustris*, *Crepis paludosa*, *Phragmites australis* and the ferns *Thelypteris palustris*, *Matteuccia struthiopteris*.

Classification

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

EUNIS

G1.4 Broadleaved swamp woodland not on acid peat

EuroVegChecklist:

Alnion glutinosae Malcuit 1929

Salici pentandrae-Betulion pubescentis Clausnitzer in Dengler et al. 2004

Rhamno carthaticae-Betulion pubescentis Clausnitzer in Dengler et al. 2004;

Annex I:

9080 Fennoscandian deciduous swamp woods

Emerald:

G1.4115 Eastern Carpathian Alnus glutinosa swamp woods

G1.414 Steppe swamp Alnus glutinosa woods

? G1.44 Wet-ground woodland of the Black and Caspian Seas

MAES-2:

Woodland and forest

IUCN:

1.4 Temperate Forest

EFT:

11.2 Alder swamp forest

11.4 Pedunculate oak swamp forest

11.5 Aspen 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 habitat type with a dispersed distribution in several biogeographic regions.

Geographic occurrence and trends

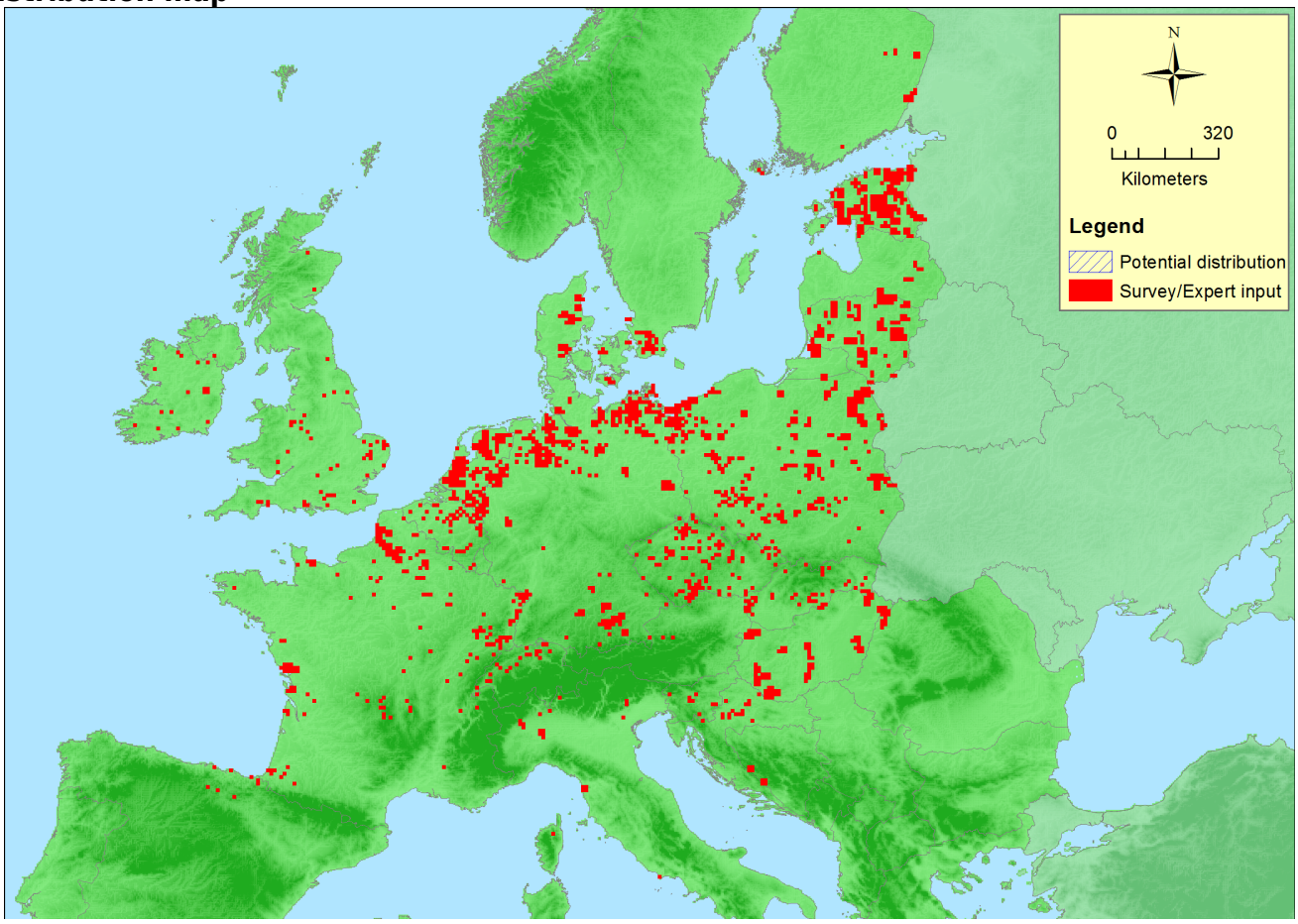
EU 28	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
Austria	Present	unknown Km^2	Decreasing	Decreasing
Belgium	Present	40 Km^2	Stable	Decreasing
Bulgaria	Present	0.5 Km^2	Decreasing	Decreasing
Croatia	Present	10-50 Km^2	Decreasing	Decreasing
Czech Republic	Present	39 Km^2	Decreasing	Decreasing
Denmark	Uncertain	unknown Km^2	Unknown	Unknown
Estonia	Present	400 Km^2	Decreasing	Unknown
Finland	Aland Islands: Uncertain Finland mainland: Present	unknown Km^2	Decreasing	Decreasing
France	France mainland: Present	Km^2	-	-
Germany	Present	<1000 Km^2	Decreasing	Decreasing
Hungary	Uncertain	ujnknown Km^2	Unknown	Unknown
Ireland	Present	9.2 Km^2	Decreasing	Increasing
Italy	Italy mainland: Present	unknown Km^2	Unknown	Unknown
Latvia	Present	225 Km^2	-	-
Lithuania	Present	1800 Km^2	Increasing	Decreasing
Luxembourg	Uncertain	unknown Km^2	Unknown	Unknown
Netherlands	Present	37 Km^2	Increasing	Stable
Poland	Present	245 Km^2	Decreasing	Decreasing
Portugal	Portugal mainland: Present	32 Km^2	Decreasing	Unknown
Romania	Present	50 Km^2	Decreasing	Decreasing
Slovakia	Present	1.5 Km^2	Decreasing	Unknown
Slovenia	Present	117 Km^2	Decreasing	Decreasing
Spain	Spain mainland: Uncertain	Km^2	Unknown	Unknown
Sweden	Uncertain	unknown Km^2	Unknown	Unknown
UK	Northern Island: Present United Kingdom: Present	70 Km^2	Unknown	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	ca. Km^2	Decreasing	Decreasing
Norway	Norway Mainland: Present	3780 Km^2	Decreasing	Unknown
Serbia	Present	Km^2	Unknown	Unknown
Switzerland	Present	10 Km^2	Decreasing	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	4237200 Km^2	2006	5400 Km^2	
EU 28+	4263000 Km^2	2014	9600 Km^2	

Distribution map



The map is likely to be incomplete, especially in Germany and the Balkan. Data sources: BOHN, EVA, ETS.

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

Estimated >60%: limited data is available but this is an azonal forest type, so broadleaved swamp woodland on non-acid peat extends much further to the east with only minor changes in floristic compostion.

Trends in quantity

Average recent trend during the past 40 to 50 years is between -25 % and -50% (EUR28, -34 %), for the EUR28+ because of a strong decrease in Norway probably well above 50%. Trends vary between -10% and

-75%, with a stronger decrease in Northern Europe and in the Mediterranean countries. The average current trend is decreasing, especially in Mediterranean and Balkan countries, while being more or less stable in wider parts of central Europe. Future trends are difficult to assess, with the scarce available data it can be assumed that future trends will on average be decreasing. Long-term historic trend data are largely missing, so an average European value is not given.

- 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
  There is an ongoing decline, mainly due to changes in hydrology and in future in addition to climate change, however EOO is well > 50,000 km².
- Does the habitat have a small natural range by reason of its intrinsically restricted area?
  No
  Justification
  The habitat can occur in large patches.

Trends in quality

Extent of degradation: 63 % (EUR28, 62% for EUR28+), Severity of degradation: 45% (EUR28 & EUR28+), i.a. moderate. The trends have been calculated from >90% (EUR28; ca. 55% EUR28+) of the broadleaved swamp woodland area on non-acid peat. With regard to the highest standard of the indicators of quality completely untouched (pristine) or oldgrowth ancient forests with sufficient dead and dying trees are only present on less than 1 % of the remaining European area. Current trends in quality are on average still decreasing, with a number of countries where it is stable. Future trends will be at least partially still decreasing due to ongoing changes in hydrology and land-use.

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

Pressures and threats

The main pressures and threats are usually linked to amelioration and changes in the hydrology (drainage, all kind of water abstractions of surface or groundwater, modifications in larger rivers etc.) and to pollution and eutrophication of waterbodies. These changes can be linked to agriculture, forestry or general water management. Forestry with planting of non-native trees or removal of dead and dying trees are additional pressures, regionally also invasive non-native species or diseases such as Phytophthora alni can be important. No distinct differences in pressures and threats for EU28 and EU28+.

List of pressures and threats

Sylviculture, forestry

Forest replanting (non native trees)
Removal of dead and dying trees

Pollution

Pollution to surface waters (limnic, terrestrial, marine & brackish)

Invasive, other problematic species and genes

Invasive non-native species

Problematic native species

Natural System modifications

Human induced changes in hydraulic conditions
Modification of hydrographic functioning, general
Modification of standing water bodies
Water abstractions from surface waters
Water abstractions from groundwater

Natural biotic and abiotic processes (without catastrophes)

Introduction of disease (microbial pathogens)

Climate change

Changes in abiotic conditions

Conservation and management

Restoring the natural hydrology (removal of drainage, stopping water abstractions) and reducing all kinds of pollution and eutrophication sources are vital to reducing the pressures and threats. In addition, restoring coniferous plantations to natural tree composition and allowing for more dead and dying trees in managed forests are important to maintain the full set of characteristic species. Regionally specific measures for reducing the impact of non-native species will be necessary.

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
Managing water abstraction

Measures related to spatial planning

Establish protected areas/sites
Establishing wilderness areas/allowing succession

Measures related to urban areas, industry, energy and transport

Specific management of traffic and energy transport systems

Conservation status

Annex I types:

9080: BOR U2, CON U2

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

Natural full recovery of the habitat usually needs time-spans of over 200 years. While the tree species can be planted, the full set of characteristic species includes many saproxylic intertebrates and fungi which need a historic habitat continuity, old and dead trees in a late development stage of forests. Semi-aquatic characteristic invertebrates can partially recolonize after interventions, provided the necessary habitat structures have developed. Some of the characteristic plant species such as *Carex* spp. have a long term

seedbank and may redevelop if the hydrology is restored. Through intervention a partial recovery is possible in > 50 years, for the full set of saproxylic species also >200 years are needed.

Effort required

200+ years
Both

Red List Assessment

Criterion A: Reduction in quantity

Criterion A	A1	A2a	A2b	A3
EU 28	-34 %	unknown %	unknown %	unknown %
EU 28+	-24 %	unknown %	unknown %	unknown %

During the past 40-60 years there was an average decrease of -34 % in EUR28 and -24% in EUR28+. However because of a strong decrease in Norway (without precise data), the average decrease in EUR 28+ could be well above -50% and is expected to be above -30% (leading to the conclusion Vulnerable as well). Information on long-term historic trends is limited and therefore not useful in the assessments.

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	Yes	No	> 50	Yes	Yes	No	No
EU 28+	> 50 000 Km^2	Yes	Yes	No	> 50	Yes	Yes	No	No

Both EOO and AOO are very large and do not meet the criteria B1 or B2. The habitat exists as an azonal type at numerous locations throughout the range.

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	63 %	45 %	unknown %	unknown %	unknown %	unknown %
EU 28+	62 %	45 %	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%

The overall extent and severity are weighted average calculated from >90% of the area in the EUR28 and ca. 55 % in EUR28+. Information on long historical or future trends is incomplete and could not be used for creteria CD2 and CD3. Reduction in quality often affected both biotic and abiotic changes, in some countries mainly abiotic changes (hydrology). Splitting of criteria C and D was not meaningful.

Criterion E: Quantitative analysis to evaluate risk of habitat collapse

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

There is no quantative analysis available that estimates the probability of collapse of this habitat type. Due to its azonal distribution and strong link to humid microclimatic conditions climate change can potentially have a large effect on future losses in area and range.

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	DD	NT	DD	DD	DD	DD	DD	DD	DD	DD	DD
EU28+	VU	DD	DD	DD	LC	LC	DD	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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