

D2.2a Poor fen

Summary

This type of mire, fed by throughput of acid, nutrient-poor ground water occurs in a variety of topographic situations - around upland springs, in the lags of raised bogs, in forest hollows and among infertile fen-grassland complexes - through the siliceous landscapes of temperate Europe, particularly the north. There is a continuous surface carpet of oligotrophic *Sphagnum* spp. and small sedges and an associated flora of mire generalists characteristic of less minerotrophic situations. Surface patterning is usually very limited but, towards the boreal regions, there can be gentle hummock-hollow with scattered trees on drier areas. Drainage, eutrophication and tree planting are the most frequently reported threats, with local peat extraction. Maintenance or restoration of the hydrological system is essential for conservation and, where eutrophication has occurred, grazing or mowing may help reduce the growth of productive herbage.

Synthesis

This habitat has been assessed as Vulnerable (VU) in the EU28, based on the decline in area over the last 50 years, and Least Concern for the EU28+. However, there is a massive reduction up to over 90% of its previous area in many European countries, and therefore the habitat is regionally much more threatened. However, in the countries of Scandinavia, where by far the largest areas of this mire type occur, the reductions are relatively low. The habitat is not as sensitive regarding reduction of quality as the calcareous counterpart Short-sedge base-rich fens. On the contrary, slight drainage often leads to acidification of mire surfaces due to the higher influence of rainfall and therefore to an expansion of poor fens at the expense of calcareous types.

Overall Category & Criteria			
EU 28		EU 28+	
Red List Category	Red List Criteria	Red List Category	Red List Criteria
Vulnerable	A1	Least Concern	-

Sub-habitat types that may require further examination

A split between Boreal subtypes and Central-European/Atlantic subtypes would certainly result in a higher Red List category for the second sub-habitat.

Habitat Type

Code and name

D2.2a Poor fen



Poor fen at lag of raised bog with *Sphagnum angustifolium*, *S. magellanicum*,



Poor fen in fen grasslands in the small mountain valley on calcium-poor bedrock

Calliergon stramineum, *Carex rostrata*, *C. limosa*, *Drosera rotundifolia*, *Eriophorum angustifolium*, *Trichophorum alpinum*, *Andromeda polifolia* and *Vaccinium oxycoccus*, close to Sepplau, Austria (Photo: Petra Hájková).

with *Eriophorum angustifolium*, *Carex nigra*, *C. echinata*, *C. canescens*, *Juncus filiformis*, *Sphagnum fallax*, *S. inundatum* and *Warnstorfia exannulata* at Shiroka Polyana, Bulgaria (Photo: Petra Hájková).

Habitat description

Wide group of acidic (pH 3-5), minerotrophic mires, dominated by sedges and *Sphagnum* species. Poor fens occur in many different hydro-topographical situations and are typical components of the marginal lagg of raised bogs. In temperate Europe they also occur around mountain springs, in forest hollows, and in infertile fen-grassland complexes, but always on non-calcareous bedrock. Poor fens can also form the main type of usually small mire areas in weakly minerotrophic basins. Poor fens are the main transition type between D2.3a Quaking mires and D1.1 Raised bogs. Poor fens receive limited minerotrophic water input from upper catchments usually via non-distinct, diffuse flow paths. Poor fens can have unidirectional slope and lateral water flow but hummock-string patterning typical for D3.2 Aapa mires is missing.

Poor fens are characterized by continuous carpets of oligotrophic *Sphagnum* spp. combined with high abundance of sedges like *Carex canescens*, *Carex echinata*, *Carex nigra*, *Carex lasiocarpa*, *Eriophorum scheuchzeri*, *Trichophorum cespitosum*. Other abundant species are and *Andromeda polifolia*, *Betula nana*, *Dactylorhiza maculata*, *Eriophorum vaginatum*, *Potentilla erecta*, and *Vaccinium oxycoccus*. Also certain deep-rooted species more characteristic of D2.3a Quaking mires are frequent in poor fens, namely *Eriophorum angustifolium*, *Carex rostrata* and *Menyanthes trifoliata*. Ground layer is often dominated by *Sphagnum angustifolium*, *Sphagnum fallax*, *Sphagnum flexuosum*, *Sphagnum papillosum* and *Sphagnum magellanicum*, while other brown mosses can also be frequent, including *Straminergon stramineum*, *Polytrichum commune* and *Warnstorfia fluitans*. Higher degree of minerotrophic influence can be found only occasionally, as indicated by occurrence of e.g. *Sphagnum subsecundum*, *Sphagnum obtusum* or *Sphagnum teres*. In boreal zone, hummocks with *Sphagnum fuscum*, *Polytrichum strictum*, *Calluna vulgaris* and *Empetrum nigrum* are sometimes found in poor fens, with *Salix* spp., *Rhamnus frangula*, *Betula pubescens* or individual cranked pines (*Pinus sylvestris*).

Indicators of good quality:

Under natural conditions, water table is high also in summer and continuous carpets of mosses prevail with abundant sedges. Species diversity of vegetation is generally slightly higher than in D1.1 Raised bogs but clearly lower than in intermediate fens. In good hydrological condition there are no ditches that drain or disconnect water flow from the upper drainage area to the mire. Tree growth is limited to scattered individuals on hummocks or mire margins.

Characteristic species :

Vascular plants: *Andromeda polifolia*, *Betula nana*, *Carex canescens*, *Carex chordorrhiza*, *Carex diandra*, *Carex lasiocarpa*, *Carex limosa*, *Carex magellanica* subsp. *irrigua*, *Carex rostrata*, *Chamaedaphne calyculata*, *Dactylorhiza maculata*, *Drosera rotundifolia*, *Drosera longifolia*, *Epilobium palustre*, *Eriophorum angustifolium*, *Eriophorum scheuchzeri*, *Eriophorum vaginatum*, *Equisetum fluviatile*, *Huperzia selago*, *Juncus filiformis*, *Ledum palustre*, *Pedicularis palustris*, *Peucedanum palustre*, *Potentilla erecta*, *Rubus chamaemorus*, *Swertia perennis*, *Trichophorum cespitosum*, *Vaccinium oxycoccus*

Bryophytes: *Aulacomnium palustre*, *Calliergonella cuspidata*, *Sphagnum aongstroemii*, *Sphagnum angustifolium*, *Sphagnum fallax*, *Sphagnum fimbriatum*, *Sphagnum flexuosum*, *Sphagnum magellanicum*, *Sphagnum obtusum*, *Sphagnum palustre*, *Sphagnum papillosum*, *Sphagnum pulchrum*, *Sphagnum riparium*, *Sphagnum subnitens*, *Straminergon stramineum*, *Warnstorfia fluitans*

Classification

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

EUNIS:

D2.2 Poor fens and soft-water spring mires

EuroVegChecklist:

Sphagno-Caricion canescentis Passarge (1964)

Caricion lasiocarpae Vanden Berghen in Lebrun et al. 1949

Sphagnion cuspidati Krajina 1934 (incl. *Scheuchzerion palustris*) p.p. marginally (types with minerotrophic influence)

Annex 1:

7140 Transition mires and quaking bogs

Emerald:

D2.226 Peri-Danubian black-white-star sedge fens

MAES-2:

Wetlands

IUCN:

5.4. Bogs, Marshes, Swamps, Fens, Peatlands

Eco-hydrological mire types (Succow & Joosten 2001):

mesotrophic acidic to subneutral kettle mires, ponding mire, hillside mires, or spring mires

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

No

Justification

The habitat is widespread in Europe, but with decreasing representation from the North to the South. The largest areas are found in Scandinavia and Ireland. The habitat is distributed more southerly compared to bogs, because it does not depend so tightly on precipitation and also occurs around springs on acidic bedrock.

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	13 Km ²	Decreasing	-
<i>Belgium</i>	Present	0.8 Km ²	Decreasing	Increasing
<i>Bulgaria</i>	Present	1 Km ²	Decreasing	Decreasing
<i>Croatia</i>	Uncertain	Km ²	-	-
<i>Czech Republic</i>	Present	27 Km ²	Decreasing	Decreasing
<i>Denmark</i>	Present	20 Km ²	Decreasing	Stable
<i>Estonia</i>	Present	350 Km ²	Unknown	Stable
<i>Finland</i>	Aland Islands: Uncertain Finland mainland: Present	7050 Km ²	Decreasing	Decreasing
<i>France</i>	France mainland: Present	unknown Km ²	-	-
<i>Germany</i>	Present	unknown Km ²	Decreasing	Decreasing

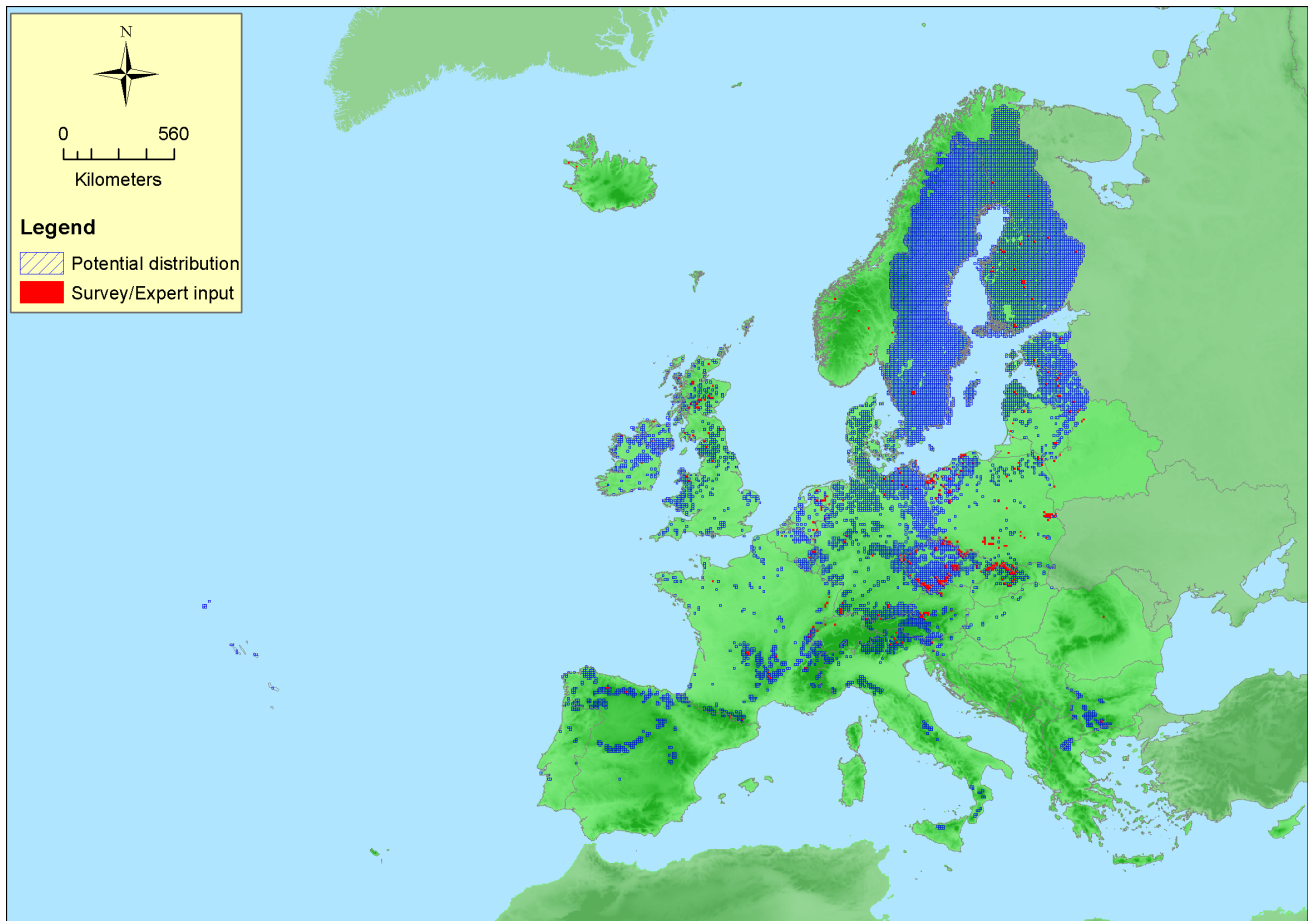
EU 28	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
<i>Greece</i>	Greece (mainland and other islands): Uncertain	Km ²	-	-
<i>Hungary</i>	Present	0.1 Km ²	Decreasing	Decreasing
<i>Ireland</i>	Present	560 Km ²	Decreasing	Unknown
<i>Italy</i>	Italy mainland: Uncertain	Km ²	-	-
<i>Latvia</i>	Present	unknown Km ²	Decreasing	Decreasing
<i>Lithuania</i>	Present	7.5 Km ²	Decreasing	Decreasing
<i>Luxembourg</i>	Uncertain	Km ²	-	-
<i>Netherlands</i>	Present	1.1 Km ²	Decreasing	Stable
<i>Poland</i>	Present	300 Km ²	Decreasing	Decreasing
<i>Romania</i>	Present	2 Km ²	Stable	Decreasing
<i>Slovakia</i>	Present	6.2 Km ²	Decreasing	Stable
<i>Slovenia</i>	Uncertain	Km ²	-	-
<i>Spain</i>	Balearic Islands: Present Spain mainland: Present	70 Km ²	Decreasing	Unknown
<i>Sweden</i>	Present	12500 Km ²	Decreasing	Decreasing
<i>UK</i>	Northern Island: Present United Kingdom: Present	75 Km ²	Decreasing	Unknown

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	0.7 Km ²	Decreasing	Stable
<i>Norway</i>	Norway Mainland: Present	15000 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
<i>EU 28</i>	9973750 Km ²	13692	13000 Km ²	AOO and EOO incl. potential distribution
<i>EU 28+</i>	12156950 Km ²	13711	33000 Km ²	AOO and EOO incl. potential distribution

Distribution map



Map is rather incomplete (a.o. in Romania and Norway), but the potential distribution is given for the EU28 based on HT7140 distribution. Data sources: EVA, ART17.

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

Due to the holarctic distribution and the huge mire areas in Eurasia, Europe (and the EU28) contributes not more than 10% to the total world-wide area.

Trends in quantity

Poor fens have been actively and massively diminished by humans throughout the whole of Europe. Whereas in mire rich countries (like in Scandinavia) the estimated proportion of decrease is around 1/4 to 1/3, the decrease in Central European countries (like Germany and Hungary) is much higher, with a loss between 80 and 90%.

- 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 is widespread in Europe.

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

Yes

Justification

Especially in Central and Southern Europe the habitat occupies relatively small stands, due to the restricted conditions in the landscape. In the Atlantic and Boreal parts of the distribution range, the habitat may occupy much larger areas.

Trends in quality

The main threats (drainage and eutrophication) soon lead to a transformation into other habitats. However, slight changes in the catchment areas frequently lead to loss in habitat quality.

- Average current trend in quality

EU 28: Decreasing

EU 28+: Decreasing

Pressures and threats

Main threats for poor fens are landscape drainage, eutrophication and agricultural intensification.

List of pressures and threats

Agriculture

Agricultural intensification

Pollution

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

Air pollution, air-borne pollutants

Natural System modifications

Modification of hydrographic functioning, general

Water abstractions from groundwater

Climate change

Droughts and less precipitations

Conservation and management

Huge efforts have been undertaken in the last decades to protect the last poor fen areas in Central and Southern Europe. Most important is the regeneration of the hydrological systems of the mires. In some areas and after eutrophication, poor fens depend on nutrient withdrawal by browsing or mowing.

List of conservation and management needs

Measures related to wetland, freshwater and coastal habitats

Restoring/Improving water quality

Restoring/Improving the hydrological regime

Managing water abstraction

Measures related to spatial planning

Legal protection of habitats and species

Conservation status

Annex I:

7140: ALP FV, ATL U2, BOR U1, CON U1, MAC U1, MED U1, PAN U2

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

Rewetting activities show that in general the hydrological regime of poor fens can be restored.

However, depending on the status of the surrounding landscape, pollution with nutrients might have effect for a long time and regeneration of nutrient poor conditions at least in Central Europe can be expected only after decades to centuries after massive new peat accumulation or after top soil removal.

Effort required

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

Red List Assessment

Criterion A: Reduction in quantity

Criterion A	A1	A2a	A2b	A3
EU 28	-31 %	unknown %	unknown %	unknown %
EU 28+	-19 %	unknown %	unknown %	unknown %

On average in the EU28 there is a loss in area of -31% over the last 50 years (data on quantitative data from 15 countries), leading to the category Vulnerable. In Central European countries the losses have been much higher. However, the area weighted mean of decline is dominated by the scandinavian countries with (still) large areas of poor fens. For the EU28+ the figure is less severe, due to relatively large amount and small declines in Norway, leading to the category Least Concern.

Criterion B: Restricted geographic distribution

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

The EOO and AOO are much larger than the thresholds for criteria B, and also the habitat occurs in many locations. Therefore, even if there are declining trends and some threats, the assessment of criterion B leads to the category Least Concern.

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	36 %	41 %	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%

The reported data on declines in quality leads to an average amount of 36% of the area that has suffered a decline of 41% severity (data from 17 EU countries). This leads to the conclusion Least Concern. As no additional data from outside the EU28 is provided, and Norway covers large parts of the EU28+ area, for the EU28+ no figures are given. It is likely that the situation is relatively better, and therefore also Least Concern is concluded.

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	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+	
Red List Category	Red List Criteria	Red List Category	Red List Criteria
Vulnerable	A1	Least Concern	-

Confidence in the assessment

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

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