

## C5.2 Tall-sedge bed

### Summary

This habitat develops throughout the European lowlands, though less commonly to the warmer south, on the margins of standing and slow-moving fresh waters just above the mean water level, but subject to periodic flooding and on ground that is water saturated for most of the year. Tall sedge communities are usually species-poor, often dominated by one productive plant, often of densely tussock habit, and accompanied by few characteristic species, often disposed in mosaics on and between the tussocks. The particular dominant depends on climate, substrate, hydrology and trophic level of the habitat and, now usually in the past, on management by grazing or cutting. The main threats are expansion of agricultural, industrial and urban areas and changes in the level of and pollution in the groundwater. Often the habitat is totally transformed without possibility of natural recovery and strong intervention is usually needed for recovery.

### Synthesis

This habitat type still has a wide distribution in Europe, despite a very large reduction in quantity (45-48%) and quality (relative severity of 42-43% on 54-55% of the extent) during the last 50 years, mainly due to intensification of agricultural land use. The habitat reaches the thresholds of Vulnerable (VU) for both EU28 and EU28+ according to criterion A1, and the figures are close to the Endangered threshold. According to criterion A3 and C/D1 the habitat qualifies for Near Threatened (NT), and in both cases values are very close to the threshold of Vulnerable. The assessment was carried out using data from only about 50% of the countries in which the habitat occur. Despite this, according to expert knowledge and literature, there is no argument to assume a very different situation in the rest of Europe.

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

This habitat type has a wide distribution, however is surely more threatened in the drier parts of Europe, such as the Southern European countries and particularly the Mediterranean region. The habitat is in these areas very often restricted to the mountain belt, it is more fragmented and it is very sensible to climatic fluctuations, that could lead to important changes in the water regime. It would be desirable to better investigate the habitat on the Southern edge of its distribution area, that includes the two specific southern alliances *Caricion broteriana* and *Caricion macrocarpae*.

### Habitat Type

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#### Code and name

C5.2 Tall-sedge bed



Large sedge (*Carex elata*) dominated freshwater vegetation close to Galvydiske, Lithuania. (Photo: Petra Hájková).



Large sedge (*Carex acutiformis*) dominated vegetation close Szusalewo, Poland (Photo: Flavia Landucci)

## Habitat description

Communities generally dominated by tall sedges typically of the order *Magnocaricetalia*. *Cladium mariscus* communities are only partly included here. When they develop in calcareous fens they are part of the habitat type D4.1c. The optimal belt for tall sedge vegetation is the geolittoral zone, the area above the mean water level, but subjected to periodical flooding and water saturated for most of the year. Tall sedge communities are usually species-poor, often dominated by one species and accompanied by few characteristic species. Some of the above mentioned dominant species have clear preferences related to climate, substrate, hydrology and trophic level of the habitat. The primary productivity of these communities is high, but clearly lower than for non-sedges tall helophytes included in the habitat C5.1a.

Tall sedge communities occur also along running waters or in wet and moist depressions of alluvial and karst plains. In the hydro-series they are later replaced by drier wet meadows and riparian shrub vegetation. They grow as fringe vegetation along lakes and ponds, often in mixture with tall reedy helophytes and forbs (habitat C5.1a). In low-productive lakes, particularly in northern Europe, *Carex rostrata*, *C. lasiocarpa* and *C. aquatilis*, with *Equisetum fluviatile*, are substituting taller reeds in water fringe helophyte vegetation. Such stands are very species poor, sometimes monospecific. However stands dominated by *Carex rostrata* and *C. lasiocarpa* in calcareous fens and bogs belong to the habitats D4.1c

Many tall sedges have an effective clonal growth: some species grow in large tussocks raising some tens of centimetres above the substrate. Wet hollows between tussocks, with accumulation of plant remains, are often occupied by small aquatic and emergent herbs and grasses (e.g. *Galium palustris* s.l., *Lycopus europaeus*, *Ranunculus trichophyllus*, *Scutellaria galericulata*, *Lemna* spp., *Utricularia* spp.), aquatic mosses and hepatics (*Calliergon* spp., *Drepanocladus aduncus*, *Riccia* spp., *Ricciocarpos natans*). Various mixtures of herbs and grasses often indicate unstable successive states after disturbances.

Tall sedge communities have been earlier used for cattle grazing and mowing, and many have been converted to arable land and pasture. They are largely impacted by water level regulation, construction activities and eutrophication. In recent past eutrophication and decline of grazing has often led to the increase of tall reeds in the lower part of tall sedge communities, and to increase of shrubs and trees in the upper part. Tall plants from drier positions can also invade sedge-dominated stands. In dynamic alluvial landscapes this habitat may exist more sustainable, occupying slightly different sites over different years. In other sites it can only be maintained for longer times by mowing.

Indicators of good quality:

- Natural water and flooding regime
- No alteration of substrate chemistry
- Species poor stands dominated by sedges
- Low cover of annuals, ruderal and/or nitrophilous species

- Low anthropogenic impacts in terms of construction activities, eutrophication, drainage etc.
- No enhanced biomass due to eutrophication or replacement by tall reedy vegetation
- Absence of invasive alien species (e.g. *Impatiens glandulifera*, *Bidens frondosa*, *Ludwigia* spp., *Fallopia* spp., etc.)
- Shrubs and trees occur in low cover and do not show increasing trends
- Low cover of tall herbs from drier positions and other habitats (e.g. *Calystegia sepium*, *Eupatorium cannabinum*, *Valeriana officinalis*, *Cirsium* spp., etc.)

Characteristic species:

Vascular plants: *Calamagrostis canescens*, *C. purpurea*, *Carex acuta*, *C. acutiformis*, *C. appropinquata*, *C. aquatilis*, *C. buxbaumii*, *Carex cespitosa*, *C. diandra*, *C. distica*, *C. elata*, *C. hispida*, *C. juncella*, *C. lasiocarpa*, *C. lyngbyei* (Iceland), *C. melanostachya*, *C. paniculata*, *C. pseudocyperus*, *C. randalpina*, *C. riparia*, *C. rostrata*, *C. reuteriana*, *C. rhynchophysa*, *C. vesicaria*, *C. vulpina*, *Cladium mariscus*, *Cyperus longus*, *Phalaris arundinacea*. Frequently accompanying species are *Lycopus europaeus*, *Lythrum salicaria*, *Mentha aquatica*, *Rorippa amphibia*, *Oenanthe aquatica*, *Glyceria* spp., *Equisetum fluviatile*, *Solanum dulcamara*, in the Mediterranean area also some *Juncus* species may occur in this habitat (e.g. *J. effuses* and *J. inflexus*).

Bryophytes: *Drepanocladus* spp. (mainly *D. aduncus*), *Campylium* spp., *Calliergon* spp., in paludified stands also *Sphagnum* spp.

Vertebrates: *Rana* spp., *Hyla* spp., *Bombina* spp., *Bufo* spp., *Natrix* spp., *Hierophis viridiflavus* (Mediterranean area). If this habitat is close to rivers or lakes can be important bird haunts. The species of the family *Ardeidae* are rather frequent.

Invertebrates: *Nematoda*, *Lumbricus* spp., *Odonata*, *Larinioides* spp., *Dolomedes fimbriatus*, *D. plantarius*, *Argiope* spp.

### **Classification**

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

EUNIS:

D5.2 Beds of large sedges normally without free-standing water

EuroVegChecklist (alliances):

*Magnocaricion elatae* Koch 1926

*Magnocaricion gracilis* Géhu 1961

*Caricion broterianae* (Rivas-Martinez et al. 1986) J.A. Molina 1966

*Phalaridion arundinaceae* Kopecký 1961

*Caricion microcarpae* Gamisans 1975

Annex 1:

6450 Northern boreal alluvial meadows

Emerald:

D5.2 Beds of large sedges normally without free-standing water

MAES-2:

Wetlands

IUCN:

5. Wetlands (inland)

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

No

Justification

This habitat occurs in whole Europe, but different species are dominant in different ecological (substrate and nutrient) conditions.

### **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	Unknown Km <sup>2</sup>	Decreasing	Decreasing
<i>Belgium</i>	Present	4-10 Km <sup>2</sup>	Stable	Decreasing
<i>Bulgaria</i>	Present	Unknown Km <sup>2</sup>	Increasing	Unknown
<i>Croatia</i>	Present	40 Km <sup>2</sup>	Decreasing	Decreasing
<i>Czech Republic</i>	Present	98 Km <sup>2</sup>	Decreasing	Decreasing
<i>Denmark</i>	Present	Unknown Km <sup>2</sup>	Unknown	Unknown
<i>Estonia</i>	Present	Unknown Km <sup>2</sup>	Unknown	Unknown
<i>Finland</i>	Aland Islands: Present Finland mainland: Present	Unknown Km <sup>2</sup>	Decreasing	Decreasing
<i>France</i>	Corsica: Present France mainland: Present	300-600 Km <sup>2</sup>	Decreasing	Decreasing
<i>Germany</i>	Present	Unknown Km <sup>2</sup>	Decreasing	Decreasing
<i>Greece</i>	Crete: Uncertain East Aegean: Uncertain Greece (mainland and other islands): Uncertain	Unknown Km <sup>2</sup>	Unknown	Unknown
<i>Hungary</i>	Present	120 Km <sup>2</sup>	Decreasing	Decreasing
<i>Ireland</i>	Present	300 Km <sup>2</sup>	Stable	Unknown
<i>Italy</i>	Italy mainland: Present Sardinia: Present Sicily: Present	143 Km <sup>2</sup>	Decreasing	Decreasing
<i>Latvia</i>	Present	Unknown Km <sup>2</sup>	Unknown	Unknown
<i>Lithuania</i>	Present	150-200 Km <sup>2</sup>	Decreasing	Decreasing
<i>Luxembourg</i>	Present	Unknown Km <sup>2</sup>	Unknown	Unknown
<i>Malta</i>	Uncertain	Unknown Km <sup>2</sup>	Unknown	Unknown
<i>Netherlands</i>	Present	35 Km <sup>2</sup>	Stable	Unknown
<i>Poland</i>	Present	Unknown Km <sup>2</sup>	Unknown	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>Portugal</i>	Madeira: Present Portugal Azores: Present Portugal mainland: Present Savage Islands: Present	14 Km <sup>2</sup>	Decreasing	Unknown
<i>Romania</i>	Present	15 Km <sup>2</sup>	Decreasing	Decreasing
<i>Slovakia</i>	Present	1 Km <sup>2</sup>	Stable	Stable
<i>Slovenia</i>	Present	31 Km <sup>2</sup>	Decreasing	Decreasing
<i>Spain</i>	Balearic Islands: Present Canary Islands: Present Spain mainland: Present	Unknown Km <sup>2</sup>	Decreasing	Decreasing
<i>Sweden</i>	Present	Unknown Km <sup>2</sup>	Unknown	Unknown
<i>UK</i>	Gibraltar: Present Northern Island: Present United Kingdom: Present	Unknown Km <sup>2</sup>	Decreasing	Unknown

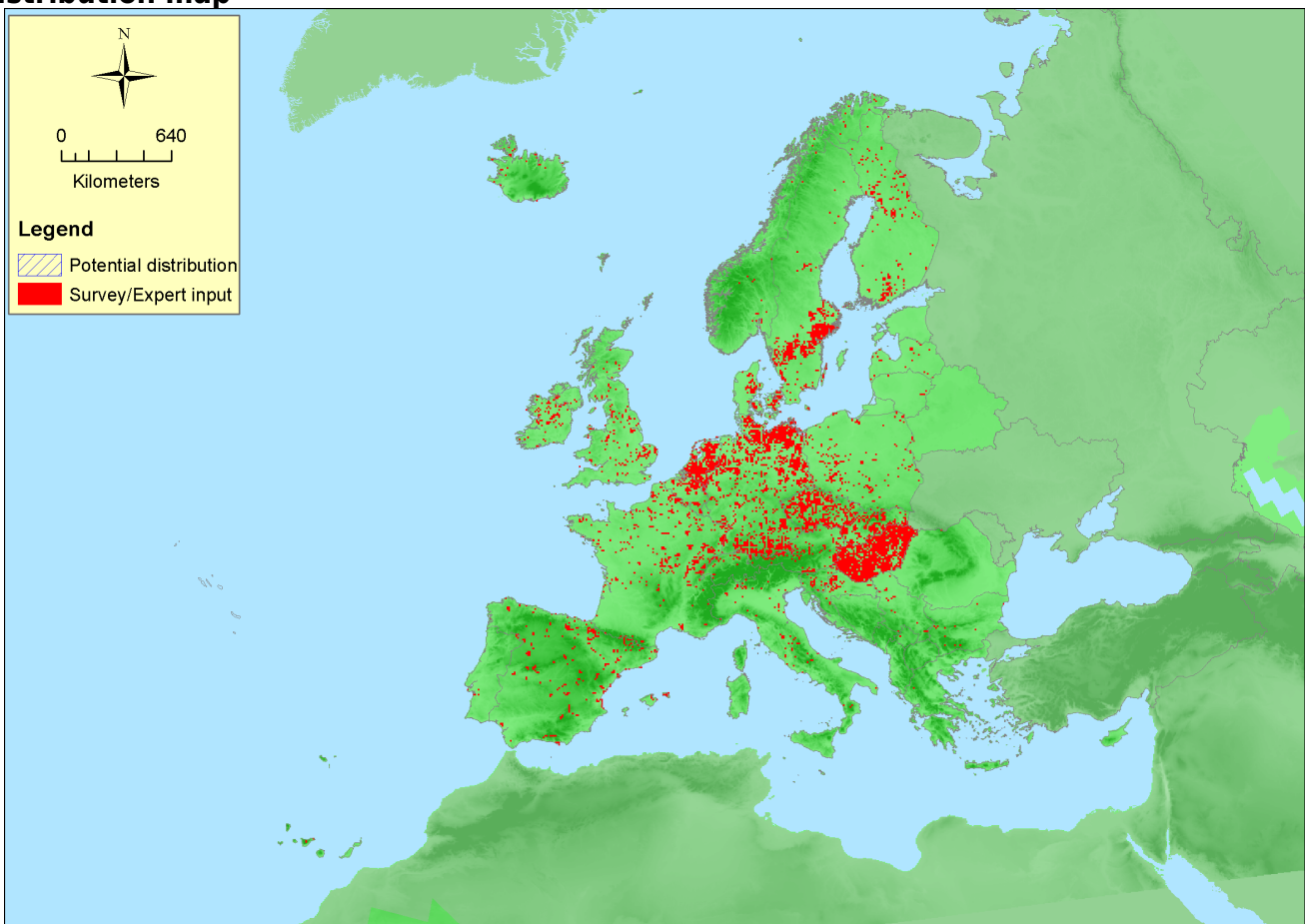
EU 28 +	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
<i>Albania</i>	Present	Unknown Km <sup>2</sup>	Unknown	Unknown
<i>Andorra</i>	Present	Unknown Km <sup>2</sup>	Unknown	Unknown
<i>Bosnia and Herzegovina</i>	Present	50 Km <sup>2</sup>	Decreasing	Decreasing
<i>Faroe Islands</i>	Uncertain	Unknown Km <sup>2</sup>	Unknown	Unknown
<i>Former Yugoslavian Republic of Macedonia (FYROM)</i>	Present	Unknown Km <sup>2</sup>	Unknown	Unknown
<i>Guernsey</i>	Uncertain	Unknown Km <sup>2</sup>	Unknown	Unknown
<i>Iceland</i>	Present	Unknown Km <sup>2</sup>	Unknown	Unknown
<i>Isle of Man</i>	Uncertain	Unknown Km <sup>2</sup>	Unknown	Unknown
<i>Jersey</i>	Uncertain	Unknown Km <sup>2</sup>	Unknown	Unknown
<i>Kaliningrad</i>	Uncertain	Unknown Km <sup>2</sup>	Unknown	Unknown
<i>Kosovo</i>	Present	Unknown Km <sup>2</sup>	Unknown	Unknown
<i>Monaco</i>	Uncertain	Unknown Km <sup>2</sup>	Unknown	Unknown
<i>Montenegro</i>	Present	Unknown Km <sup>2</sup>	Unknown	Unknown
<i>Norway</i>	Jan Mayen: Present Norway Mainland: Present Svalbard: Present	Unknown Km <sup>2</sup>	Unknown	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>San Marino</i>	Uncertain	Unknown Km <sup>2</sup>	Unknown	Unknown
<i>Serbia</i>	Present	Unknown Km <sup>2</sup>	Unknown	Unknown
<i>Switzerland</i>	Present	75 Km <sup>2</sup>	Decreasing	Stable

### 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>	8822750 Km <sup>2</sup>	4747	1929 Km <sup>2</sup>	Only 50% of the countries provided the total area.
<i>EU 28+</i>	11784600 Km <sup>2</sup>	4880	2054 Km <sup>2</sup>	Only 34% of the countries provided the total area.

### Distribution map



Map has many data gaps, for example in Poland, Norway, the Balkan and Romania, depending on availability of data in EVA and GBIF. Data sources: EVA, GBIF, NAT.

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

A broader defined similar habitat type, but hosting different species occurs in the whole boreal hemisphere. The habitat type has a Euro-Asiatic distribution but the dominant species and the general species composition change from West to East. Probably 40-50% of the habitat is within EU28, the remaining percentage is distributed among EU28+ countries and those outside Europe such as Russia, Belarus, Ukraine, Georgia, Turkey, etc.

## Trends in quantity

The habitat type results to have a general decreasing trend in quantity. Most countries for which data are available reported a decrease of the habitat between 10 and 80% with a resulting total reduction in Europe of 45-48% during the last 50 years. An even more serious decrease of the habitat is recorded by in the historical past (50-250 years ago). In this case the countries that were able to provide historical data indicated a decrease between 40 and 90% with a resulting total reduction in Europe between 43-48% of the total area. Despite the heavy decrease of the habitat in the historical past mainly due to increasing urbanization and drainage for other human uses, some countries especially from Central and Northern Europe stated that the habitat is currently stable or only slightly decreasing and expect for the future the habitat can remain stable under the current management and land use. The situation in the Southern countries appears rather different. The habitat is still decreasing (except for Bulgaria where the habitat is increasing due to water regulation of deeper marshes) and is expected to still decrease in the future.

- 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 geographical range of the habitat (EOO) is very wide and, despite the decrease in the last 50 years has been rather important (more than 40%), seems far to go under 50,000 Km<sup>2</sup>.

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

No

*Justification*

The habitat does not have intrinsically restricted area and range.

## Trends in quality

Most countries that provided data reported a moderate degradation of 10 to 80% of the habitat area with a resulting degradation of 54-55 % (EU28+ - EU28) of the habitat with a severity of 42-43% (EU28+ - EU28). The degradation state seems to not be differentiated between Southern and Northern countries and the causes of degradations are in both cases related to increasing human pressures such as water drainage, poplar plantations and changing in the management. The degradation is increasing in some areas due to the abandonment of traditional management (seasonal mowing and pasture), changing in the land use, nitrification and general induced change of soil conditions due to agriculture pollution.

- Average current trend in quality

EU 28: Decreasing

EU 28+: Decreasing

## Pressures and threats

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Main pressures during the past and present time are represented by tentative land melioration for the expansion of agriculture, industrial and urban areas. During the past centuries alluvial plains of many European countries, especially in those areas where mountain landscape prevails have been completely drained and transformed in arable lands or urban areas. Superficial and groundwater pollution especially related to agriculture is a very frequent problem. The drainage of the habitat is very often accompanied by plantation of trees for paper production such as *Populus* spp. and *Robinia pseudoacacia*. Despite the human land erosion has been limited in this habitat during the last years in several countries, one future threat is represented by climate changes that could result in a change of the hydrological regime.

## List of pressures and threats

### Agriculture

- Modification of cultivation practices
  - Crop change
  - Grassland removal for arable land
- Mowing / Cutting of grassland
  - Abandonment / Lack of mowing
- Grazing
  - Abandonment of pastoral systems, lack of grazing
- Use of biocides, hormones and chemicals
- Fertilisation

### Urbanisation, residential and commercial development

- Urbanised areas, human habitation
- Industrial or commercial areas
- Discharges
- Structures, buildings in the landscape
- Storage of materials

### Pollution

- Pollution to surface waters (limnic, terrestrial, marine & brackish)
- Pollution to groundwater (point sources and diffuse sources)

### Natural System modifications

- Human induced changes in hydraulic conditions
  - Landfill, land reclamation and drying out, general
  - Canalisation & water deviation
  - Flooding modifications
  - Water abstractions from groundwater

### Climate change

- Changes in abiotic conditions
  - Droughts and less precipitations
  - Flooding and rising precipitations
- Changes in biotic conditions
  - Habitat shifting and alteration
  - Desynchronisation of processes

## Conservation and management

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Legal measures for limiting erosion of the habitat due to expanding human activities have already been taken from some European countries during the last years. However such measures are not evenly adopted in Europe. In some countries this habitat is considered protected, in some other is not. Water abstraction and regulation are limited and regulated only when the habitat belongs to a protected area. Common regulation about land use, water abstraction and agriculture should be applied in those countries where the habitat is less frequent and abundant. Periodic grazing and mowing could have positive results for the maintenance of some vegetation types typical of this habitat and for limiting the vegetation succession processes. Traditional landscape management could be reintroduced in some areas to improve the quality of the habitat. Another useful measure may be the respect of buffer zones between the habitat and the agricultural lands. Restoring the habitat could be useful in some areas where



the habitat strongly declined, however the restoration of such habitat is always very hard and often not successful.

## List of conservation and management needs

### Measures related to agriculture and open habitats

Maintaining grasslands and other open habitats

### 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

Establish protected areas/sites  
Legal protection of habitats and species  
Manage landscape features

### Measures related to urban areas, industry, energy and transport

Urban and industrial waste management

## Conservation status

Annex 1:

6450: ALP U2, BOR U2

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

The capacity of this habitat to naturally recover is different according to the kind of damage that the habitat has undergone. If the damage interested the groundwater level it may be possible to recover the habitat through hydrologic intervention and only if the chemical and physical soil conditions remained unaltered. If the damage concerns the land use, i.e. transformation of the habitat in agricultural land, trees plantation, it becomes almost impossible to properly recover the habitat due to the deep changes of the soil conditions. It could be possible through intervention recreating functionally similar conditions, but it would be difficult to have again the same species composition. There are not sufficient studies about restoration of this habitat type to have a clear vision of the efforts needed.

## Effort required

50+ years	200+ years
Through intervention	Through intervention

## Red List Assessment

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### Criterion A: Reduction in quantity

Criterion A	A1	A2a	A2b	A3
EU 28	-46/48 %	unknown %	unknown %	unknown %
EU 28+	-45/47 %	unknown %	unknown %	unknown %

The calculated trend in quantity resulted in a reduction of 45-48% during the last 50 years that corresponds to the category Vulnerable for both EU28 and EU28+. This calculation was performed using

the quantitative data available, which however represent only 50% of the total countries in which the habitat occur or is expected to occur. The trend in quantity is very close to the threshold of category Endangered. If we consider the extended lack of data the habitat could also be in this last category. However there is not sufficient information available to make such assumption. Similar is the historical trend, showing a reduction of the habitat between 43 and 48% for the last 250 years. Only 3 countries provided data concerning the historical trend and therefore this is insufficient for an assessment. However the habitat probably decreased throughout most of the other European countries.

### 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

The habitat is largely extended in Europe therefore both EOO and AOO are far from the thresholds required by criterion B to consider the habitat threatened. However spatial extent, biotic and abiotic quality of the habitat are in continuing decline.

### 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 %	43 %	unknown %	unknown %	unknown %	unknown %
EU 28+	54 %	42 %	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 reduction in biotic and abiotic quality over the last 50 years affected 54-55% of the extent of the habitat in Europe with a severity of 42-43%. This calculation is based on data provided by approximately 50% of the countries in which the habitat is expected to occur. According to criterion C/D the habitat is Near Threatened. A similar trend in quality is expected in the countries for which there are no data, however a slight underestimation or overestimation may be due to the rather large gap of data. In case of slight underestimation of severity the habitat would result Vulnerable.

### Criterion E: Quantitative analysis to evaluate risk of habitat collapse

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

No data available for applying 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	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)

### Assessors

F. Landucci

### Contributors

Type description: H. Toivonen, F. Landucci, G. Arts, J.A. Molina, B. Poulin.

Territorial data: R. Tzonev, Zs. Molnár, J. Capelo, D. Espírito-Santo, K. Šumberová, D. Paternoster, R. Delarze, A. Ssymank, P. Finck, U. Raths, U. Riecken, E. Agrillo, S. Armiraglio, S. Assini, F. Attorre, G. Buffa, L. Casella, D. Gigante, G. Pezzi, R. Venanzoni, D. Viciani, A. Mikolajczak, J. Brophy, J. Šibík, L.M. Delescaille, V. Rašomavičius, A. Čarni, N. Juvan, E. Weeda, T. Kontula, Ž. Škvorc, C. Bită-Nicolae, J.A. Molina, Đ. Milanović, J. Rodwell

Working Group Freshwater Habitats: G. Arts, F. Landucci, J.A. Molina, B. Poulin, H. Toivonen

### Reviewers

A. Ssymank

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