C3.5b Periodically exposed shore with stable, mesotrophic sediments with pioneer or ephemeral vegetation

Summary

This habitat type is found throughout the European lowlands along periodically emergent shorelines of rivers, on exposed bottoms of lakes and ponds, in wetlands at the edges of arable lands, rarely in ephemeral flush habitats, and in artificial ponds that are periodically drained in summer. In rivers and lakes, the timing of exposure of the shoreline depends on the precipitation seasonality and on the time of snowmelt. The habitat is characterized by pioneer ephemeral vegetation of low-growing, weakly competitive plants developing in summer and autumn. The main threats are natural succession where drying continues, eutrophication and introduction or changes in the management of water bodies. Whenever the habitat is damaged it can be restored through proper management actions tailored to favor the alternation of wet and dry periods and to limit the eutrophication of the sediments.

Synthesis

The data available for the assessment represent only around the 30% of the countries in which the habitat is expected to occur. Some countries reported a wide range of trend in quantity which causes uncertainty in the average trend of the habitat (criterion A1), with values ranging between Least Concern (LC) and Vulnerable (VU). Using these uncertain data, the habitat has been assessed as Vulnerable, taking into account trend in quality (criterion C/D1), with values very close to the thresholds of Vulnerable.

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

Most of the vegetation communities and characteristic species composing this habitat type have limited distribution ranges, and geographical subtypes may be distinguished, which are likely to be more threatened than the habitat in the whole of Europe.

Habitat Type

Code and name

C3.5b Periodically exposed shore with stable, mesotrophic sediments with pioneer or ephemeral vegetation

Exposed bottom of an artificial pond near Tchořovice in southwestern Bohemia

Carex bohemica stand near Lyon, France (Photo: Flavia Landucci).

(Czech Republic) with a pioneer ephemeral community dominated by *Peplis portula* and *Eleocharis ovata* (Photo: Milan Chytrý).

Habitat description

This habitat type is found along the periodically emergent shorelines of rivers, on exposed bottoms of permanent lakes and ponds, in wetlands at the edges of arable lands and rarely in ephemeral flush habitats. In rivers and lakes, the timing of exposure of their shoreline depends on the precipitation seasonality and on the time of snowmelt. This habitat type includes also artificial ponds drained in summer in intervals of several years as a part of their management. This habitat type must not be confused with Mediterranean vernal pools, which are instead included in the habitat type C1.6b. The habitat types here considered is characterized by pioneer ephemeral vegetation developing especially in summer and autumn. Plants growing in these environments are mainly annual, low-growing and competitively weak species from various families. Well-represented genera include *Cyperus, Elatine, Juncus, Ranunculus, Spergularia* and *Veronica*. Vegetation is usually short and open, and its cover increases with successional stage. Some stands are dominated by single species while others are co-dominated by several species. In some cases, especially on exposed pond bottoms and on river shores, the successional stage with short-growing ephemeral wetland species is followed, especially after water draw-down, by a stage with tall-growing annuals such *Bidens, Chenopodium, Persicaria* and *Rumex maritimus*. This succession results in a change of this habitat type into the habitat type C3.5a.

Indicators of good quality:

- Occurrence in natural environments such as shores of unregulated rivers, natural lakes, pools or ephemeral flush habitats
- Occurrence of rare wetland species
- Absence or low incidence of competitive, tall-growing and nutrient-demanding wetland herbs
- Absence or low incidence of neophytes

Vascular plants: *Blackstonia acuminata, Carex bohemica, Centaurium pulchellum, Centunculus minimus, Cerastium dubium, Coleanthus subtilis, Corrigiola littoralis, Cyperus fuscus, C. michelianus, Elatine alsinastrum, E. hexandra, E. hydropiper, E. orthosperma, E. triandra, Eleocharis acicularis, E. ovata, Fimbristylis annua, Glinus lotoides, Gnaphalium uliginosum, Gnaphalium luteo-album, Gypsophila muralis, Hypericum humifusum, Illecebrum verticillatum, Isolepis setacea, Juncus bufonius, J. bulbosus, J. capitatus, J. ranarius, J. sphaerocarpus, J. tenageia, Koenigia islandica, Limosella aquatica, Lindernia procumbens, Ludwigia palustris, Lythrum hyssopifolia, L. tribracteatum, Mentha pulegium, Montia arvensis, Myosurus minimus, Plantago major subsp. intermedia, Potentilla norvegica, P. supina, Pulicaria vulgaris, Pycreus flavescens, P. glomeratus, Radiola linoides, Ranunculus flammula, R. lateriflorus, R. ophioglossifolius, R. sardous, Sagina apetala, S. nodosa, Samolus valerandi, Schoenoplectus supinus, Solenopsis minuta, Spergularia echinosperma, S. kurkae, S. rubra, Tillaea aquatica, Verbena supina, Veronica anagalloides, V. catenata, V. scardica*

Bryophytes: *Anthoceros agrestis, A. punctatus, Leptobryum pyriforme, Physcomitrella patens, Physcomitrium eurystomum, P. pyriforme, P. sphaericum, Riccia cavernosa, R. ciliifera, R. crystalline, R. huebeneriana*

Vertebrates: *Rana* spp., *Bombina* spp., *Bufo* spp., *Triturus* spp., *Hyla* spp., *Natrix natrix, N. tessellata, N. maura, Sterna albifrons*, *S. hirundo, Charadrius dubius, Himantopus himantopus, Recurvirostra avosetta, Vanellus vanellus.*

Macroinvertebrates: *Nematodes, Lumbricus* spp., *Hirudo medicinalis, H. troctina, H. verbana, Planorbis* spp., *Unio* spp., *Anodonta* spp., *Lepidurus apus, Triops cancriformis, Anostraca*.

Classification

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

following typologies.

EUNIS:

C3.5 Periodically inundated shores with pioneer and ephemeral vegetation

C3.7 Unvegetated or sparsely vegetated shores with non-mobile substrates

EuroVegChecklist:

Nanocyperion Koch 1926

Radiolion linoidis Pietsch 1973

Elatino macropodae-Damasonion alismatis de Foucault 1988

Eleocharition soloniensis Philippi 1968

Verbenion supinae Slavnić 1951

Annex 1:

3130 Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoeto-Nanojuncetea*

Emerald:

C3.51 Euro-Siberian dwarf annual amphibious swards

MAES-2:

Fresh water, Rivers and lakes

IUCN:

5.6. Seasonal/Intermittent Freshwater Lakes [over 8 ha]

5.8. Seasonal/Intermittent Freshwater Marshes/Pools [under 8 ha]

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

Justification
The habitat is wide distributed in Europe and depends mainly by the alternation of wet and dry conditions and physic-chemical characteristic of the soil. This habitat type becomes more rare in southern Europe where the dry period can be too long.

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	Unknown	Unknown
Belgium	Present	unknown Km^2	Unknown	Unknown
Bulgaria	Present	16.6 Km^2	Decreasing	Decreasing
Croatia	Present	1 Km^2	Decreasing	Decreasing
Czech Republic	Present	6 Km^2	Decreasing	Stable
Denmark	Present	unknown Km^2	Unknown	Unknown
Estonia	Uncertain	unknown Km^2	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)
Finland	Aland Islands: Uncertain Finland mainland: Uncertain	unknown Km^2	Unknown	Unknown
France	Corsica: Present France mainland: Present	100 Km^2	Decreasing	Decreasing
Germany	Present	unknown Km^2	Decreasing	Decreasing
Hungary	Present	10 Km^2	Decreasing	Decreasing
Ireland	Present	unknown Km^2	Unknown	Unknown
Italy	Italy mainland: Present Sardinia: Present Sicily: Present	6 Km^2	Decreasing	Decreasing
Latvia	Present	unknown Km^2	Unknown	Unknown
Lithuania	Present	1 Km^2	Stable	Stable
Luxembourg	Uncertain	unknown Km^2	Unknown	Unknown
Netherlands	Present	1.7 Km^2	Stable	Unknown
Poland	Present	unknown Km^2	Unknown	Unknown
Portugal	Portugal mainland: Present	unknown Km^2	Unknown	Unknown
Romania	Present	unknown Km^2	Unknown	Unknown
Slovakia	Present	unknown Km^2	Unknown	Unknown
Spain	Spain mainland: Present	9 Km^2	Decreasing	Decreasing
Sweden	Present	unknown Km^2	Unknown	Unknown
UK	Gibraltar: Present Northern Island: Present United Kingdom: Present	unknown Km^2	Unknown	Unknown

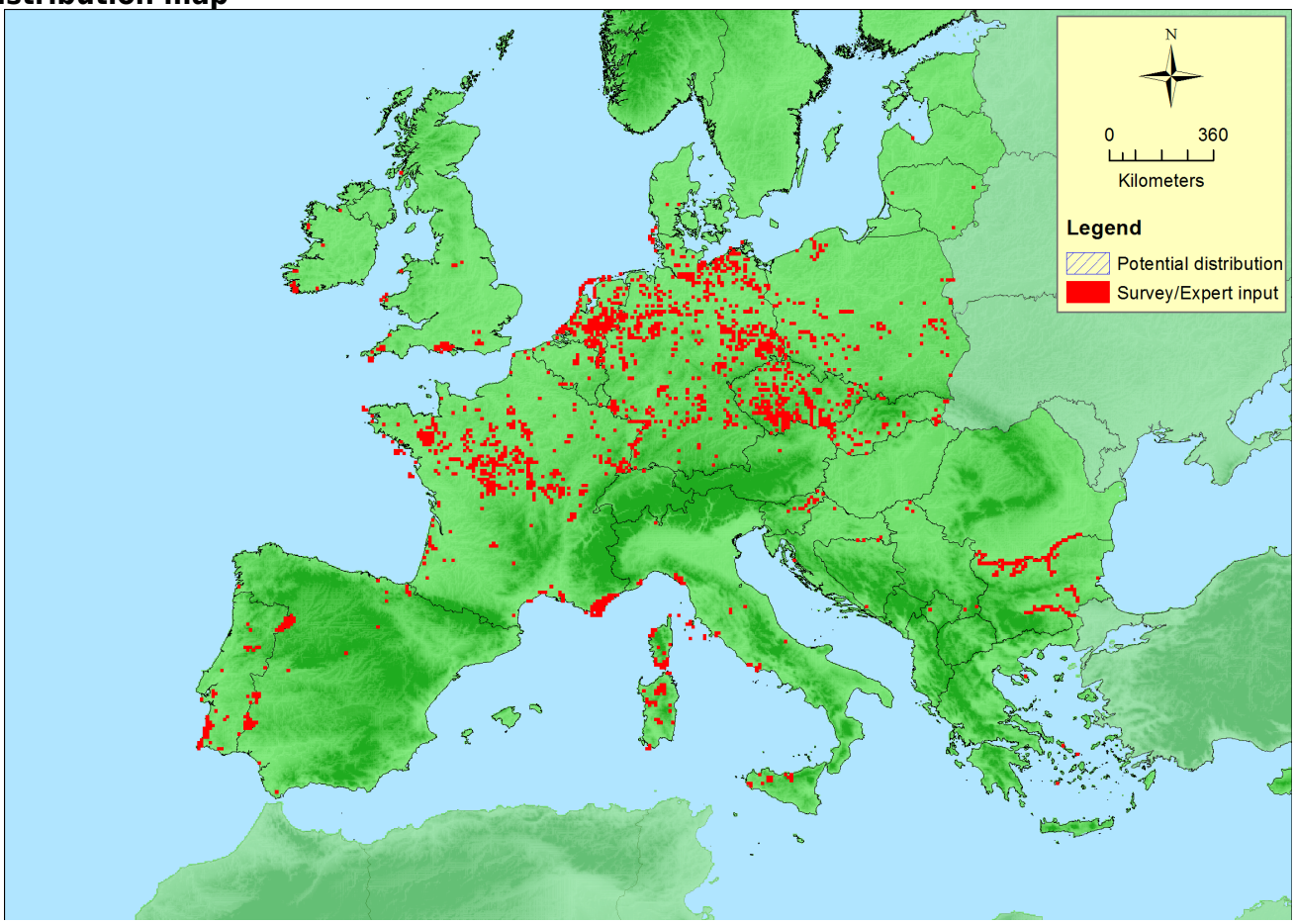
EU 28 +	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
Albania	Uncertain	unknown Km^2	Unknown	Unknown
Bosnia and Herzegovina	Present	3 Km^2	Decreasing	Decreasing
Former Yugoslavian Republic of Macedonia (FYROM)	Uncertain	unknown Km^2	Unknown	Unknown
Iceland	Present	unknown Km^2	Unknown	Unknown
Kaliningrad	Uncertain	unknown Km^2	Unknown	Unknown
Kosovo	Uncertain	unknown Km^2	Unknown	Unknown
Montenegro	Uncertain	unknown Km^2	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)
Norway	Jan Mayen: Uncertain Norway Mainland: Uncertain Svalbard: Uncertain	unknown Km^2	Unknown	Unknown
Switzerland	Present	1.5 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	6007850 Km^2	1986	136 Km^2	Only 33% of the countries in which the habitat is expected to occur provided the total area
EU 28+	6007850 Km^2	2000	141 Km^2	Only 30% of the countries in which the habitat is expected to occur provided the total area

Distribution map



Map is incomplete, but the distribution of Annex I-type 3130 provides potential distribution for the EU28. Coastal sites should be excluded, as they belong to B-types. Data gaps exist particularly in the Balkan, and possibly for Norway. Data sources: Art17, EVA, GBIF, NAT.

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

The current distribution of the habitat type worldwide is difficult to calculate. Probably around 70% of this habitat type in Europe lies within the EU28. The rest is across EU28+ countries. However the same or very similar habitat types can be found in countries outside EU28 and EU28+ like Russia, Ukraine, Belarus, Turkey, etc.

Trends in quantity

Only about 30% of the countries provided some data or information about the trends in quantity of the habitat. The habitat has decreased during the last 50 years in most of the countries. Only Lithuania and Netherland reported that the habitat is currently stable, while in Belgium it is even increasing due to a better management compared to the past of fishpond systems. All the other countries reported a decrease of the habitat between 10 and 80% with a total trend in quantity estimated between 18 to 36% in EU28 and 21 to 37% in EU28+.

- 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 natural range of the habitat (EOO) is quite extended and probably far to go below 50,000 Km^2.
- Does the habitat have a small natural range by reason of its intrinsically restricted area?
  No
  Justification
  The geographical range of the habitat is quite extended.

Trends in quality

Almost all countries that provided data reported a negative trend in quality for the last 50 years with 20 to 90% of the habitat surface in each country affected by a slight to severe degradation. The trend in quality for whole Europe resulted in a relative severity of degradation of 47% affecting 49% of the total extent of the habitat. The general trend has been calculated on around 30% of the countries in which the habitat is supposed to occur (only those countries that provided quantitative data). Currently the habitat results to be stable in some countries such as Finland, Czech Republic and Lithuania.

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

Pressures and threats

The pressures for this habitat are mainly represented by anthropogenic factors, which induce modification of the water regime or alteration of the soil physical and chemical conditions. Most frequent issues are related to the increase of trophy level and the accumulation of organic sediments that lead this habitat to evolve in the habitat “C3.5a Periodically exposed shores and muddy banks, mainly eutrophic sediments with pioneer and ephemeral vegetation characterized by abundant biomass production”. Other pressures are represented by all those activities that lead to an alteration of the hydrologic regime such as fish farming (here in particular summer drainage restriction), removal of sediments, water abstractions, but also abandonment of the management of water bodies and wet arable fields. The climate change, especially the prolonging of the dry periods, is also a very important cause of local reduction of this habitat. The invasion of this habitat by non-native flora and fauna species is also rather frequent problem that however often follow or come together with other alterations of the habitat like eutrophication.

List of pressures and threats

Biological resource use other than agriculture & forestry

Marine and Freshwater Aquaculture
- Intensive fish farming, intensification

Fishing and harvesting aquatic resources

Pollution

Pollution to surface waters (limnic, terrestrial, marine & brackish)
Soil pollution and solid waste (excluding discharges)

Invasive, other problematic species and genes

Invasive non-native species

Natural System modifications

Human induced changes in hydraulic conditions
- Landfill, land reclamation and drying out, general
- Removal of sediments (mud...)
- Flooding modifications
- Modification of hydrographic functioning, general
- Water abstractions from surface waters
- Water abstractions from groundwater
- Abandonment of management of water bodies

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

The conservation and management should include actions leading to a correct management of water abstraction, agricultural and industrial activities in the surrounding and fish farming. The restoration and improvement of the water quality and hydrological regime of fishponds, natural pools and river beds may be necessary in those cases where the habitat is damaged. Such habitat can be in contact with crops, or developing in water bodies used as water supplies for agricultural purposes. In such cases the habitat could be favoured by adopting sustainable crops, limiting the use of fertilizers and biocides, rather than intensive crops.

List of conservation and management needs

Measures related to agriculture and open habitats

Other agriculture-related measures

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

Manage landscape features

Measures related to hunting, taking and fishing and species management

Regulation/Management of fishery in limnic systems

Measures related to urban areas, industry, energy and transport

Urban and industrial waste management

Conservation status

Annex 1 type:

3130: ALP FV, ATL U1, BLS FV, BOR U1, CON U2, MAC U1, MED U1, PAN U1, STE FV

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

The capacity of this habitat to recover naturally differs according to the type of damage that the habitat has undergone. If the damage is due to eutrophication or pollution, that is the most common case, the habitat difficulty can recover naturally. In these cases intervention through removal or substitution of polluted soil should be done. Removing the polluted soil and the causes of pollution the habitat can be restored in relatively short time, 10 years. If the soil seed bank is removed from the water body, intervention through reintroduction of species could be necessary.

Effort required

10 years	50+ years	200+ years
Through intervention	Naturally	Naturally

Red List Assessment

Criterion A: Reduction in quantity

Criterion A	A1	A2a	A2b	A3
EU 28	- 17/33 %	unknown %	unknown %	unknown %
EU 28+	- 19/34 %	unknown %	unknown %	unknown %

According to the calculation performed on the data available (around 30%) the reduction in quantity resulted to be between 17 to 33% in EU28 and 19 to 34% in EU28+. This means that there is a wide uncertainty about the current status of the habitat, which may be considered in the categories Least Concern to Vulnerable. Further uncertainty of this result is due to the total area of the habitat reported for France. This value seems to be very high compared with that one reported by neighboring countries. Considering the large lack of data and the uncertain degree of the status it was chosen - based on expert knowledge - to follow a preservative approach considering the habitat Vulnerable (VU) according to criterion A.

Criterion B: Restricted geographic distribution

Criterion B	B1				B2				B3
	EOO	a	b	c	AOO	a	b	c	
EU 28	> 50000 Km^2	Yes	Unknown	unknown	> 50	Yes	Unknown	unknown	unknown

Criterion B	B1				B2				B3
	EOO	a	b	c	AOO	a	b	c	
EU 28+	> 50000 Km^2	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	50 %	44 %	unknown %	unknown %	unknown %	unknown %
EU 28+	50 %	44 %	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 50% of the extent of the habitat with a severity of 44% in both EU28 and EU 28+ countries. The calculation is based on data provided by only 30% of the countries in which the habitat is expected to occur. According to criterion C/D the habitat is Near Threatened, however an underestimation or overestimation of the reduction in biotic and abiotic quality may be due to the large gap of data. The calculation is very close to the Vulnerable category.

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
Low (mainly based on uncertain or indirect information, inferred and suspected data values, and/or limited expert knowledge)

Assessors
F. Landucci

Contributors
Type description: M. Chytrý, with contributions by F. Landucci, G. Arts, J.A. Molina, B. Poulin, H. Toivonen

Territorial data: D. Paelinckx, J.-M. Couvreur, K. Šumberová, T. Kontula, G. Király, J. Brophy, A. Čarni, N. Juvan, J.A. Molina, E. von Wachenfeldt, R. Delarze, A. Ssymank, P. Finck, U. Raths, U. Riecken, E. Agrillo, F. Attorre, S. Bagella, L. Casella, C. Giancola, D. Gigante, G. Giusso Del Galdo, C. Marcenò, D. Viciani, H. Mäemets, A. Mikolajczak, V. Rašomavičius, E. Weeda, Ž. Škvorc, Đ. Milanović, J. Rodwell

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

Reviewers
K. Šumberová

Date of assessment
07/12/2015

Date of review
31/03/2016

References

Deil, U. 2005. A review on habitats, plant traits and vegetation of ephemeral wetlands – a global perspective. Phytocoenologia 35: 533–706.