

## C2.4 Tidal river, upstream from the estuary

### Summary

This habitat includes portions of large, mainly Atlantic, rivers subject to tidal push and pull of mainly fresh, sometimes brackish waters, upstream from the estuary. Submerged macrophytes can form extensive beds in areas with waters that are shallow at low-tide with emergents on permanently flooded banks, zonation between strongly dependent on the flooding frequency and length. Scarce because of anthropogenic alterations to estuaries, infrastructure development, pollution and invasion of non-native species pose continuing threats. Restoration measures include improving water quality and restoring the hydrological regime and a long time period is needed for restoration.

### Synthesis

A full quantitative assessment of the decline in abiotic and biotic quality and quantity was not possible due to data deficiency. However, based on a combination of assumptions and reported data from the main countries, trends have been calculated, The degradation in quality is very high, leading to the category Endangered (EN) for criterion C/D1.

Overall Category & Criteria			
EU 28		EU 28+	
Red List Category	Red List Criteria	Red List Category	Red List Criteria
Endangered	C/D1	Endangered	C/D1

### Sub-habitat types that may require further examination

No sub-habitat types have been identified.

### Habitat Type

#### Code and name

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Freshwater part of the Elbe river at Krautsand (Germany), with *Bolboschoenus maritimus* beds on the shores (Photo: Bas Kers).



Tidal creek with *Potamogeton nodosus* in the fresh-water area Biesbos in the Netherlands (Photo: Jacques van der Neut).

#### Habitat description

This habitat includes portions of large rivers subject to the tide, upstream from the estuary. The water level is subject to tidal influence, but the water is mainly freshwater or slightly brackish (1-2 psu). Several aquatic macrophytes and helophytes are characteristic of this habitat, and some of them are endemic to

specific river floodplains. In this habitat, the submerged aquatic vegetation is especially developed in shallow parts of the river system, where the water level is only about 20 cm at low tide. Here, submerged macrophytes can form extensive beds. The banks are covered by extensive helophyte vegetation, usually dominated by *Phragmites australis* that is tolerant to periodical water table fluctuations. More characteristic for the lower zones are *Schoenoplectus triqueter* and *Bolboschoenus maritimus*. The helophyte dominated vegetation growing on the permanently flooded part of the beds is included in this habitat, however the emergent vegetation growing on the periodically flooded banks, with characteristic species like *Leucojum aestivum* and *Senecio fluviatilis*, is included in the habitat type C5.1. Some endemic species occur in tidal freshwater areas, like *Oenanthe conioides* and *Deschampsia wibeliana* in the Elbe floodplain, and *Caltha palustris* ssp. *araneosa* in the Scheldt, Rhine-Meuse and Elbe floodplains.

Vegetation zonation is highly dependent on flooding frequency. In sheltered parts of the tidal creeks, which almost never dry completely, *Nuphar lutea*, *Potamogeton pusillus* and *Potamogeton perfoliatus* may locally dominate. *Potamogeton pectinatus*, *Zannichellia palustris* ssp. *palustris*, *Sagittaria sagittifolia*, *Veronica anagallis-aquatica*, *Veronica catenata* and *Sparganium emersum* sometimes also occur in or near the gullies. Special (semi)aquatic species that occur in tidal freshwater habitats are those of the genus *Elatine*. Although extreme rare and not completely associated with tidal freshwater habitats, *Elatine hydropiper* and *Elatine triandra* occur in this system in The Netherlands.

Tidal freshwater wetlands have become scarce in Europe because of drastic human alterations of estuarine geomorphology. The habitat is restricted to the Atlantic and North Sea coast of Europe, where tidal fluctuation is relatively large. In the current situation, the main tidal freshwater wetlands are distributed directly upstream from the estuaries of the Thames, Trent (UK), Weser (DE), Elbe (DE/NL), Rhine-Meuse (NL), Scheldt (B), Garonne, Loire, Seine, Charente (FR) and Mondego (PT).

Indicators of good quality:

- Submerged, open fields of sediment-rooted aquatic macrophytes
- Absence of or only limited alterations of estuarine hydromorphology
- Tidal amplitude unchanged
- Freshwater to slightly brackish water
- Good water quality in terms of nutrient content and water clarity supporting submerged macrophyte growth

Characteristic species:

Vascular plants: *Bolboschoenus maritimus*, *Caltha palustris* ssp. *araneosa*, *Deschampsia wibeliana*, *Elatine hydropiper*, *Elatine triandra*, *Leucojum aestivum*, *Najas marina*, *Najas minor*, *Nasturtium officinale*, *Oenanthe conioides*, *Potamogeton nodosus*, *Potamogeton perfoliatus*, *Schoenoplectus triqueter*, *Senecio fluviatilis*, *Senecio paludosus*, *Sparganium emersum*, *Vallisneria spiralis*, *Veronica anagallis-aquatica*, *Veronica catenata*, *Zannichellia palustris*.

Fish: *Alosa fallax*

### **Classification**

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

EUNIS:

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EuroVegChecklist:

*Potamogetonion* Libbert 1931

*Phragmition communis* Koch 1926 (marginal)

*Scirpion maritimi* Dahl et Hadac 1941 (marginal)

Annex 1:

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(very small parts overlap with: 3260 Water courses of plain to montane levels with the *Ranunculus fluitantis*)

Emerald:

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MAES-2:

Fresh water, Rivers and lakes

IUCN ecosystems:

5.1. Permanent Rivers/Streams/Creeks [includes waterfalls]

Water Framework Directive:

Transitional waters

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

Yes

Regions

Atlantic

Justification

In Europe, the largest freshwater tidal areas are found in rivers that flow to the Atlantic and North Sea coast, where tidal differences are largest.

### **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>Belgium</i>	Present	Unknown Km <sup>2</sup>	Unknown	Unknown
<i>Denmark</i>	Present	Unknown Km <sup>2</sup>	Unknown	Unknown
<i>France</i>	Corsica: Uncertain France mainland: Present	Unknown Km <sup>2</sup>	Decreasing	Decreasing
<i>Germany</i>	Present	Unknown Km <sup>2</sup>	Decreasing	Decreasing
<i>Ireland</i>	Present	Unknown Km <sup>2</sup>	Stable	Unknown
<i>Italy</i>	Italy mainland: Present Sardinia: Present Sicily: Present	2.0 Km <sup>2</sup>	Decreasing	Decreasing
<i>Latvia</i>	Uncertain	Unknown Km <sup>2</sup>	Unknown	Unknown
<i>Netherlands</i>	Present	93 Km <sup>2</sup>	Decreasing	Decreasing

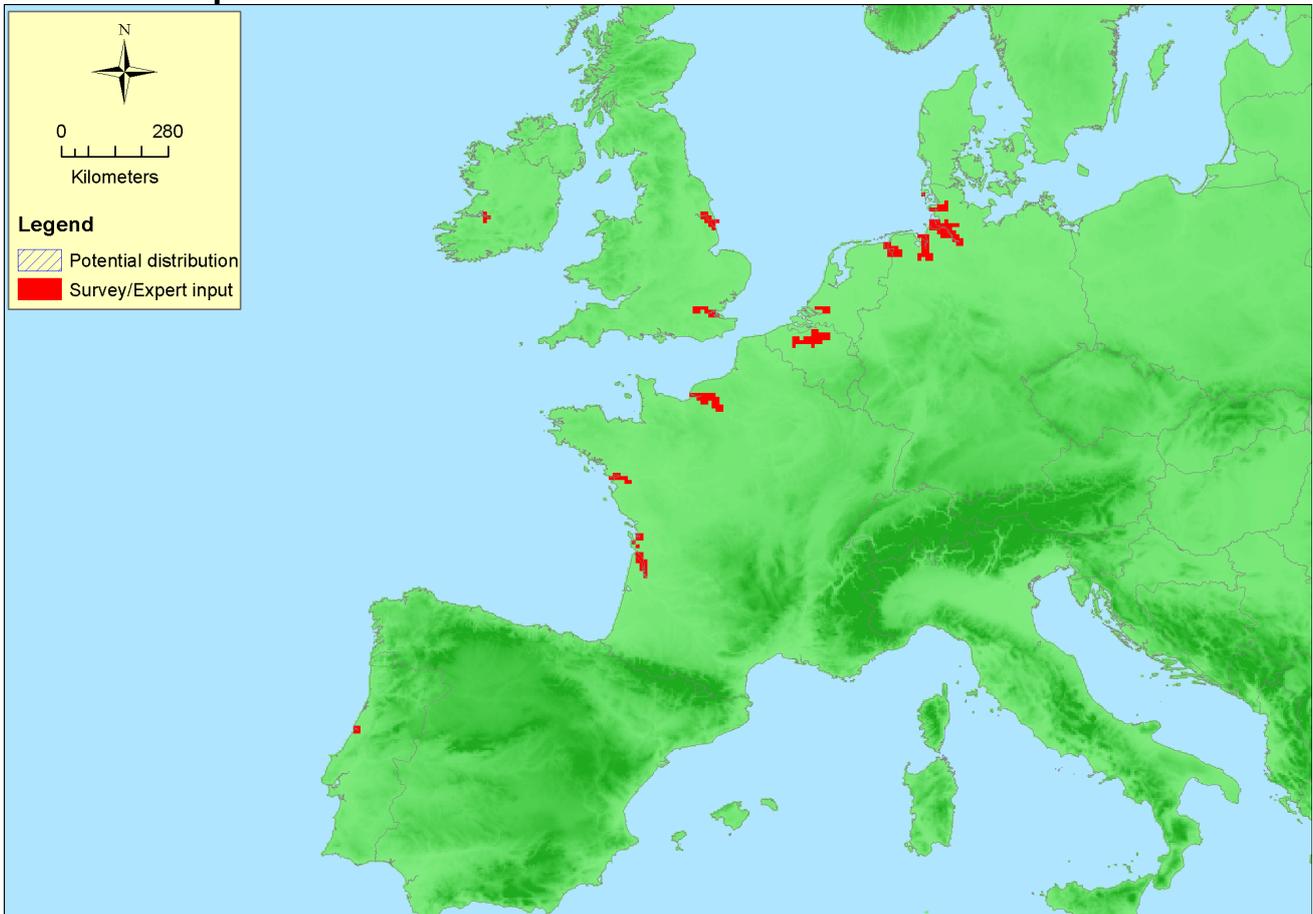
EU 28	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
<i>Spain</i>	Balearic Islands: Uncertain Canary Islands: Uncertain Spain mainland: Present	Unknown Km <sup>2</sup>	Unknown	Unknown
<i>UK</i>	Gibraltar: Uncertain Northern Island: Uncertain United Kingdom: Present	Unknown Km <sup>2</sup>	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>Norway</i>	Jan Mayen: Uncertain Norway Mainland: Present Svalbard: Uncertain	Unknown Km <sup>2</sup>	Unknown	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>	1148700 Km <sup>2</sup>	189	unknown Km <sup>2</sup>	
<i>EU 28+</i>	1148700 Km <sup>2</sup>	189	unknown Km <sup>2</sup>	

### Distribution map



Map is probably incomplete and may provide an overestimation in the tidal rivers. Data sources: EVA, EXP.

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

Only a small percentage of the total worldwide area of the habitat lies in the EU, probably around 20 %.

### Trends in quantity

Very few quantitative data on present area have been reported, while these are needed for calculating average European trends. Therefore, as an alternative, the amount of freshwater tidal habitat has been estimated from the amount of the habitat type “1130 Estuaries” in the Atlantic region that has been reported for the Article 17 report of the Habitats Directive. Assuming that the amount of fresh water habitat is 10-20% of the area of the Atlantic estuaries, and using the reported trend values from Germany, Ireland, Netherlands and France (covering 66% of the area), the average trend in area is -14% for the EU28. For EU28+ no additional data is available.

- 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 natural range, following regression.

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

Yes

*Justification*

The habitat has a small natural area in all sites, as it includes parts of the large rivers subject to the tide and upstream from the estuary. The water level is subject to tidal influence, however the water is mainly freshwater or is slightly brackish. These conditions of freshwater tide are only available in a limited part of river systems discharging into marine waters.

### Trends in quality

Making the same assumptions on area as for calculating trends in quantity, it was possible to calculate average European trend in quality, using reported data from United Kingdom, Germany, Netherlands and France, covering more than 80% of the area. The UK reported a very small negative trend in quality, but negative trend values for Germany, France and The Netherlands were very high. On average in the EU28 (and EU28+) 54% of the remaining area is negatively affected, with very high severity (88%).

- Average current trend in quality

EU 28: Decreasing

EU 28+: Decreasing

## Pressures and threats

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The main pressures and threats include hydraulic modification of the habitat and related modifications of the natural conditions of freshwater tide and the natural shoreline. Secondly, water pollution is a main pressure, including eutrophication and diffuse pollution and point pollution. Thirdly, invasive non-native species form a threat for the inhabiting native species of the habitat.

### List of pressures and threats

#### Pollution

Nutrient enrichment (N, P, organic matter)

Input of contaminants (synthetic substances, non-synthetic substances, radionuclides) - diffuse sources, point sources, acute events

## Invasive, other problematic species and genes

Invasive non-native species

## Natural System modifications

Canalisation & water deviation  
Flooding modifications  
Lack of flooding  
Modifying structures of inland water courses  
Small hydropower projects, weirs  
Wave exposure changes  
Dykes, embankments, artificial beaches, general  
Dykes and flooding defense in inland water systems  
Other human induced changes in hydraulic conditions

## Conservation and management

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The current approaches to conservation and management are:

1. Restoring and improving water quality e.g. by cutting off discharge of point sources with polluted water;
2. Restoring and improving the hydrological regime e.g. by allowing tidal influence in dammed sea arms and rivers;
3. Installing protected areas large enough to maintain hydrological and water quality conditions.

## List of conservation and management needs

### Measures related to wetland, freshwater and coastal habitats

Restoring/Improving water quality  
Restoring/Improving the hydrological regime

## Conservation status

Mainly no related Annex 1-types.

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

Natural recovery is hardly possible, although due to climatic changes and sea level rise the freshwater tidal habitat might change its position along the gradient. Intervention includes allowing tidal influences in dammed sea arms and rivers and cutting off polluting discharges into the surface water.

## Effort required

50+ years
Through intervention

## Red List Assessment

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### Criterion A: Reduction in quantity

Criterion A	A1	A2a	A2b	A3
EU 28	-15 %	unknown %	unknown %	unknown %
EU 28+	-15 %	unknown %	unknown %	unknown %

Based on some assumptions for the area (see section “Trend in quantity”) and trend data from 4 EU28-countries (covering about 66% of the habitat area) the average trend over the last 50 years was calculated to be -15%. This leads to the conclusion Least Concern for criterion A1. No or too few data on long historical trends or future trends are available.

### Criterion B: Restricted geographic distribution

Criterion B	B1				B2				B3
	E00	a	b	c	A00	a	b	c	
EU 28	> 50000 Km <sup>2</sup>	Yes	Yes	no	> 50	Yes	Yes	no	no
EU 28+	> 50000 Km <sup>2</sup>	Yes	Yes	no	> 50	Yes	Yes	no	no

There is a continuing decline in area and quality, but A00 and E00 are above the threshold for criteria under B.

### 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	54 %	88 %	unknown %	unknown %	unknown %	unknown %
EU 28+	54 %	88 %	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%

Based on assumptions for the area (see section “Trend in quantity”) and trend data from 4 EU28-countries (covering about 84% of the habitat area) the average trend in quality over the last 50 years was calculated to negatively affect 54% of the area with a severity of 88%. This leads to the conclusion Endangered for criterion C/D1. The change in quality concerns both biotic and abiotic aspects. No or too few data on long historical trends or future trends are available.

### 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	LC	DD	DD	DD	LC	LC	LC	EN	DD	DD	DD	DD	DD	DD	DD	DD	DD
EU28+	LC	DD	DD	DD	LC	LC	LC	EN	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
Endangered	C/D1	Endangered	C/D1

### Confidence in the assessment

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

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## References

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