

## A2.5c Atlantic coastal salt marsh

### Summary

Atlantic salt marsh comprises natural grasslands developed on sands and clays subject to tidal fluctuation along more sheltered stretches of the Atlantic European coast, north of mid-Portugal, and around the North Sea. Outside the EU28, small areas from Iceland and Norway are included here. The vegetation varies according to the frequency and length of inundation, the regional climate and sediment type, and there is typically a zonation from more to less halophytic assemblages of grasses and herbs in moving up-marsh. However, this is often complicated by patterns of creeks and pans, and the influence of grazing at higher levels. The habitat provides an important nesting and feeding resource for waders and stopovers for migratory birds. The most important pressures are related to direct destruction for industry, settlements and transportation, degradation of the hydrographic functionality, pollution and spread of non-native species, some introduced for fixing labile sediments. Also, changes in pastoral management with overgrazing or abandonment are threatening in a few countries. With rising sea-levels and shifting coastal sediments, further changes can be expected.

### Synthesis

Atlantic salt marshes have undergone a reduction in area of about 26% in the EU countries during the last 50 years, while large parts (>60%) of the remaining area are negatively affected, with relatively high severity (58%). Such figures for countries outside the EU (mainly Iceland and Norway) are unknown, but assumed to be slightly better, but the habitat is mostly restricted to the EU and therefore the conclusion is applied to both the EU28 and EU28+ region. The severe reduction in quality parameters results in the Red List category Vulnerable (VU), while for reduction in quantity the category Near Threatened is scored.

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

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

There are no specific sub-habitats that may require further examination.

### Habitat Type

#### Code and name

A2.5c Atlantic coastal salt marsh



Middle belt of the salt marsh of the small Wadden Sea island Rottummerplaat (Netherlands), dominated by the pink flowering *Limonium vulgare* (Photo: Bas Kers).



Sheep grazed salt marshes near Le Mont Saint Michel, Normandie, France (Photo: John Janssen).

## Habitat description

This habitat comprises natural grasslands on saline, clayey substrates along the coasts of the Atlantic Ocean, including the North Sea, characterized by halophytes. The northern limit of the habitat lies in northern Iceland and northern Norway (see habitat A2.5a), the southern limit lies in central Portugal (estuary of river Mondego), from which point southwards the salt marshes have predominantly Mediterranean characteristics. The most important factor for this azonal habitat is flooding by sea water, creating a gradient from lower, daily flooded parts towards higher parts with a low flooding frequency and duration and a more fluctuating soil salinity. With the flooding, sediments are brought in, and differences in sedimentation patterns (sand is deposited in the more dynamic parts, clay in low dynamic areas) creates a geomorphology of deep drainage channels (creeks), bordered by higher, sandy levees, with lower, clayey depressions behind. The salt marshes form transitions to bare mud flats on the lower elevation, and dunes or dune slacks on the higher part. These salt marshes are found in sheltered parts along the coast, like in lagoons, in sea inlets behind dunes, on the inland side of barrier islands, in estuaries, and in the Wadden Sea also on so-called "green beaches" (transition areas flooded both from North Sea and Wadden Sea) and rarely on sheltered parts of broad beaches.

The typical zonation of the North-Western Atlantic contains very open annual *Salicornia* species and perennial *Spartina* fields in the pioneer marsh (alliances *Thero-Salicornion*, *Spartinion maritimae*), open communities of *Puccinellia maritima*, *Limonium vulgare*, *Halimione portulacoides*, *Triglochin maritima*, *Spergularia maritima* and *Plantago maritima* in the lower salt marsh (alliance *Puccinellion maritimae*) and more closed communities of *Juncus gerardi*, *Festuca rubra*, *Agrostis stolonifera*, *Armeria maritima*, *Elytrigia pycnanthus*, *Juncus maritimus* and *Artemisia maritima* in the higher salt marsh (alliance *Armerion maritimae*). The latter form transitions towards brackish *Potentillion anserinae* communities (sometimes considered as *Loto tenuis-Trifolion fragiferi* Westhoff et Den Held ex de Foucault 2009) or towards *Plantago coronopus*, *Sagina maritima* and *Cochlearia danica* communities (alliance *Saginion maritimae*) on rarely flooded sand dunes. In places with seepage of freshwater, *Blysmus rufus*, *Phragmites australis* or *Bolboschoenus maritimus* may dominate the vegetation (alliance *Scirpion maritimae*). Also *Apium graveolens* and *Oenanthe lachenalii* are characteristic for such brackish transitions. Alpha diversity is in general low and rare species are few, for example *Halimione pedunculata*, *Salicornia disarticulata*, *Scirpus americanus*, *Hordeum maritimum*, *Puccinellia fasciculata* and *Bupleurum tenuissimum*. In the thermo-Atlantic regions of Southwestern France, Northern Spain and Portugal, several other species with an Atlantic-Mediterranean distribution are found. In the first place several perennials chenopods grow here, like *Sarcocornia perennis*, *Arthrocnemum fruticosum* and *Suaeda vera*. Other 'southern elements' include *Inula crithmoides*, *Juncus acutus*, *Frankenia laevis*, *Hutchinsia procumbens*, *Triglochin bulbosa* subsp. *barrelieri*, *Parapholis incurva*, and *Spartina maritima* on the lower parts of the salt marsh.

Along the Atlantic coast saline meadows are also found in sites that have been embanked, sometimes centuries or decades ago, but still are fed with saline or brackish water. Such salt marshes often lack the typical geomorphology but contain almost the same species composition as freely flooded salt marshes. They are described here as part of Atlantic salt marshes; in most cases they only represent a small part of the area of the habitat type.

Many of the salt marshes along the Atlantic coast have a long tradition of extensive grazing. Ungrazed salt marshes are rare, but large examples exist, for instance in the Netherlands. No management leads, because of progressing clay sedimentation and nutrient enrichment, towards relatively species poor salt-marshes, where the lower belts are dominated by *Halimione portulacoides*, and the higher parts by *Elytrigia atherica* (*pycnanthus*). Close to dunes or dikes *Phragmites australis* may dominate, but unlike in the Baltics, salinity and larger tidal fluctuations prevent reed to dominate large areas and threaten the diversity of the salt marshes. Therefore, reed beds form part of the Atlantic salt marshes, end in almost all cases these reed beds contain several halophytes. In general it is expected that low extensive grazing causes the highest biodiversity in Atlantic salt marshes.

Salt marshes are important stop overs on the fly ways of migrating birds. *Puccinellia maritima* for example provides a consistent diet for goose species. The habitat also is an important breeding and resting site for many waders. Besides for birds, salt marshes are important for specialized invertebrates (insects), many of them living just on one or a few halophytic plant species. They are considered as very productive ecosystems and the creeks form nurseries for some fish species, like *Dicentrarchus labrax*.

Salt marshes are threatened by drainage, building of hard sea defense systems (dikes), modification of the topography, invasive species (*Spartina anglica*, *Spartina alterniflora*) and eutrophication of the sea water. Sea level rise, resulting from climatic change, may cause erosion, especially of the pioneer belts with *Salicornia* where vegetation cover is very low.

Indicators of good quality:

The following characteristics are considered as indicators of good quality:

- Pattern of branching creeks, with levees and depressions
- Regularly flooding with sea water (absence of dikes...)
- Presence of rare species
- Low level or absence of invasive and nitrophilous species
- Complete set of zonation belts, with no overrepresentation of certain belts
- Absence of erosion

Characteristic species:

Vascular plants: *Agrostis stolonifera*, *Armeria maritima*, *Apium graveolens*, *Artemisia maritima*, *Aster tripolium*, *Atriplex litoralis*, *Atriplex prostrata*, *Blysmus rufus*, *Bolboschoenus maritimus*, *Bupleurum tenuissimum*, *Carex distans*, *Carex extensa*, *Centaurium littorale*, *Centaurium pulchellum*, *Cochlearia danica*, *Cochlearia officinalis ssp. anglica*, *Cochlearia officinalis ssp. officinalis*, *Desmazeria marina*, *Festuca rubra*, *Frankenia laevis*, *Frankenia pulverulenta*, *Glaux maritima*, *Halimione pedunculata*, *Halimione portulacoides*, *Hordeum marinum*, *Hutchinsia procumbens*, *Juncus gerardi*, *Juncus maritimus*, *Limonium vulgare*, *Lotus tenuis*, *Odontites littoralis*, *Oenanthe lachenalii*, *Parapholis incurva*, *Parapholis strigosa*, *Phragmites australis*, *Plantago coronopus*, *Plantago maritima*, *Potentilla anserina*, *Puccinellia distans ssp. distans*, *Puccinellia fasciculata*, *Puccinellia maritima*, *Sagina maritima*, *Salicornia disarticulata*, *Salicornia europaea* agg (*S. brachystachya*, *S. obscura*, *S. ramosissima*), *Salicornia procumbens* agg. (*S. dolichostachya*, *S. fragilis*, *S. nitens*, *S. procumbens s. decumbens*), *Sarcocornia perennis*, *Spartina anglica*, *Spartina alterniflora*, *Spartina maritima*, *Spergularia maritima*, *Spergularia salina*, *Suaeda maritima*, *Triglochin bulbosa* subsp. *barrelieri*, *Triglochin maritima*, *Trifolium fragiferum*, *Triglochin maritima*.

Mosses: *Henediella heimii* (*Pottia heimii*)

Birds: Oystercatcher (*Haematopus ostralegus*), Eurasian spoonbill (*Platalea leucorodia*), Pied avocet (*Recurvirostra avosetta*), Common shelduck (*Tadorna tadorna*), Common redshank (*Tringa totanus ssp. totanus*), Common eider (*Somateria mollissima*), ....

### **Classification**

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

EUNIS:

A2.5 Coastal saltmarshes and saline reedbeds

EuroVegChecklist (alliances):

*Puccinellion maritimae* Christiansen 1927 (= *Festucion maritimae*)

*Armerion maritimae* Br.-Bl. et De Leeuw 1936

*Atriplicion littoralis* Nordhagen 1940

*Thero-Salicornion* Br.-Bl. 1933

*Puccinellio maritimae-Spergularion salinae* Beeftink 1965

*Scirpion maritimi* Dahl et Hadac 1941

*Loto tenuis-Trifolion fragiferi* Westhoff et Den Held ex de Foucault 2009 (= *Potentillion anserinae* Tx. 1947 p.p.)

*Saginion maritimae* Westhoff et al. 1962

Annex 1:

1310 Salicornia and other annuals colonising mud and sand (*within the Atlantic region*)

1320 Spartina swards

1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)

Emerald:

A2.5 Coastal saltmarshes and reedbeds

MAES-2:

Marine inlets and transitional waters

IUCN:

12.5. Salt Marshes [Emergent Grasses]

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

Yes

Regions

Atlantic

Justification

This is the most typical habitat for the muddy sea shores of the Atlantic region.

### 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	3.7 Km <sup>2</sup>	Stable	Decreasing
<i>Denmark</i>	Present	377 Km <sup>2</sup>	Decreasing	Decreasing
<i>France</i>	France mainland: Present	540 Km <sup>2</sup>	Decreasing	Decreasing
<i>Germany</i>	Present	250 Km <sup>2</sup>	Decreasing	Decreasing
<i>Ireland</i>	Present	53 Km <sup>2</sup>	Decreasing	Unknown
<i>Netherlands</i>	Present	136 Km <sup>2</sup>	Decreasing	Decreasing
<i>Portugal</i>	Portugal Azores: Uncertain Portugal mainland: Present	63 Km <sup>2</sup>	Decreasing	Decreasing

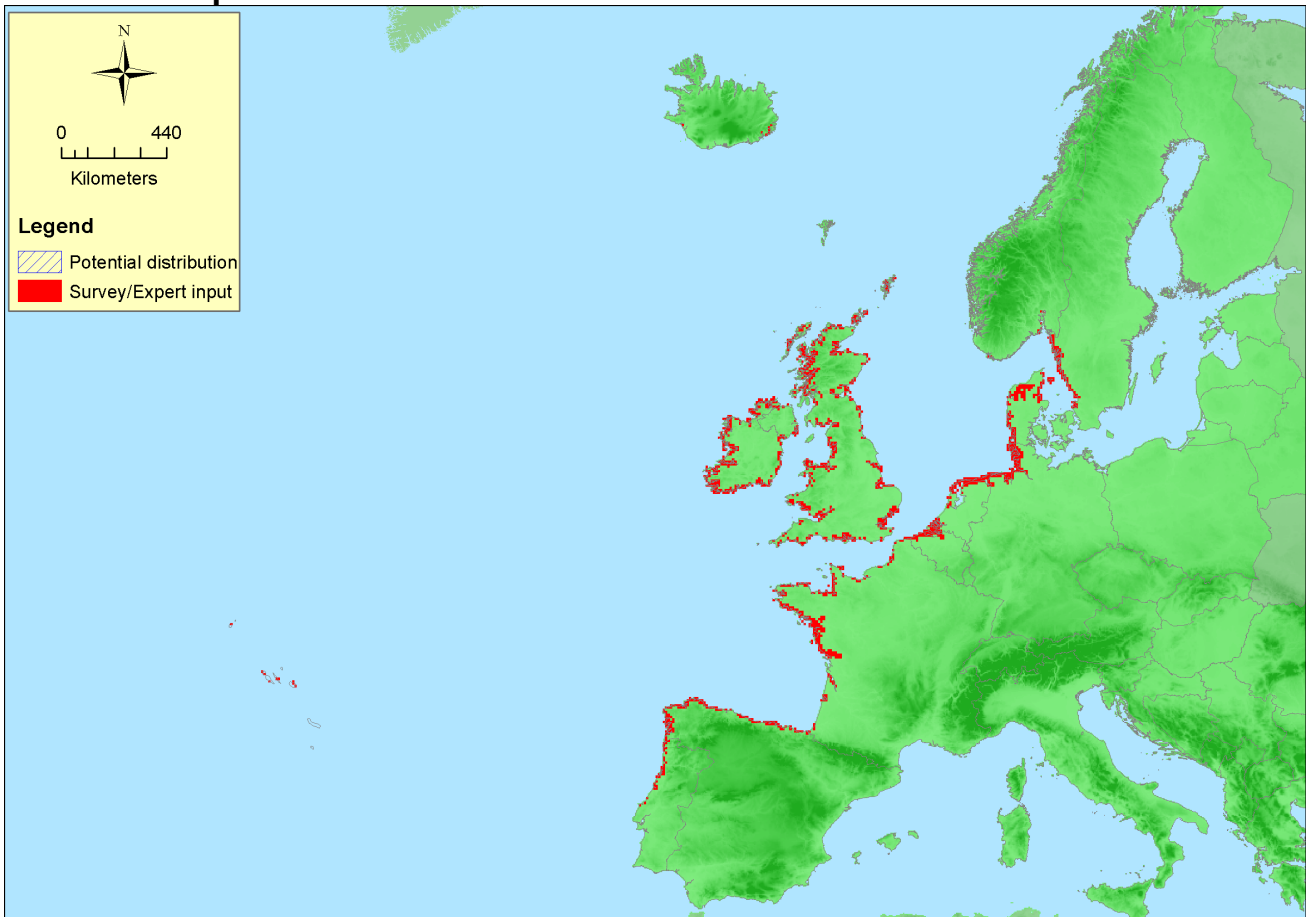
EU 28	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
<i>Spain</i>	Spain mainland: Present	46 Km <sup>2</sup>	Decreasing	Decreasing
<i>Sweden</i>	Present	Unknown Km <sup>2</sup>	Unknown	Unknown
<i>UK</i>	Northern Island: Present United Kingdom: Present	305 Km <sup>2</sup>	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)
<i>Faroe Islands</i>	Uncertain	Km <sup>2</sup>	-	-
<i>Guernsey</i>	Uncertain	Km <sup>2</sup>	-	-
<i>Iceland</i>	Present	Unknown Km <sup>2</sup>	Unknown	Unknown
<i>Isle of Man</i>	Uncertain	Km <sup>2</sup>	-	-
<i>Jersey</i>	Uncertain	Km <sup>2</sup>	-	-
<i>Norway</i>	Norway Mainland: Present	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>	2652 Km <sup>2</sup>	4065300	1773 Km <sup>2</sup>	calculated
<i>EU 28+</i>	2667 Km <sup>2</sup>	5900400	1800 Km <sup>2</sup>	estimated

### Distribution map



The map is almost complete, except for Norway and Iceland. Data sources: ART17, EVA, BOHN.

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

90%

### Trends in quantity

Based on territorial data the average decrease over a period of about 50 years in the countries of the EU is 26%. For the non-EU countries no data is available. It is assessed that the decline is a bit less in those countries (most important: Iceland, Norway), but the area there is relatively low compared to the area in the EU countries.

- 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 EOO is much larger than 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 usually covers relatively large areas in most sites.

### Trends in quality

Calculated from the territorial data, within the EU on average 63% of the area of the habitat has suffered from a degradation in quality. The average severity of the degradation in this affected area is 57%. The data is strongly influenced by France, which reported about 30% of the area. These calculations are based on data from more than 90% of the reported area.

- Average current trend in quality

EU 28: Decreasing

EU 28+: Decreasing

## Pressures and threats

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Within the countries of the EU the pressures and threats vary a bit. Southern countries (Spain, Portugal, France) indicate direct destruction by urbanization among the main threats, while most of the countries indicate modifications to hydrographic functioning, which may be caused by building structures. Pollution is an important threat in most countries. Overgrazing is a problem in the UK and Ireland, while some other countries report problems with abandonment, leading to relatively species-poor climax stages. Finally, invasive species form a problem in some salt marshes.

### List of pressures and threats

#### Agriculture

Agricultural intensification

Abandonment / Lack of mowing

#### Urbanisation, residential and commercial development

Discontinuous urbanisation

#### Invasive, other problematic species and genes

Invasive non-native species

## Natural System modifications

Human induced changes in hydraulic conditions

## Conservation and management

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For maintaining the diversity of salt marshes - often represented in the occurrence of different zonation belts (with different flooding regimes) - extensive grazing by cattle or sheep is known to be the optimum management. However, unmanaged salt marshes in Europe are relatively rare, and for some specific sites no management may be a relevant choice. In general no management (like abandonment) leads to relatively species-poor climax stages on salt marshes, but exceptions may occur, in cases where salt marshes are very dynamic and natural dynamics (flooding, goose and hare grazing) guarantee the occurrence of young succession stages for a long time. In some countries the prevention of bird hunting may be an important management action.

### 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 coastal areas

#### Measures related to spatial planning

Establish protected areas/sites

#### Measures related to hunting, taking and fishing and species management

Regulation/Management of hunting and taking

### Conservation status

Annex 1 types:

1310: ATL U2, BOR U1

1320: ATL U2

1330: ATL U2, BOR U2

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

The habitat is able to recover relatively quickly from degradation in a natural way, as long as sediment is available and there is a natural flooding regime by the sea.

### Effort required

10 years	20 years
Naturally	Naturally

## Red List Assessment

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### Criterion A: Reduction in quantity

Criterion A	A1	A2a	A2b	A3
EU 28	-26 %	unknown %	unknown %	unknown %

Criterion A	A1	A2a	A2b	A3
EU 28+	-26 %	unknown %	unknown %	unknown %

The average negative trend in area in the EU countries is based on data from eight countries, covering more than 90% of the reported area. Data for Sweden and non-EU countries are lacking, but these countries contribute relatively little to the overall area of the Atlantic salt marshes. No good data on historical or future declines are available.

### 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	No	No	>50	Yes	No	No	No
EU 28+	>50000 Km <sup>2</sup>	Yes	No	No	>50	Yes	No	No	No

The EOO is much larger than 50,000 km<sup>2</sup>, while the AOO is much larger than 50, both in the EU28 and EU28+. Also the number of locations is too high to meet the thresholds 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	63 %	58 %	unknown %	unknown %	unknown %	unknown %
EU 28+	63 %	58 %	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 affected extent and the severity of degradation have been calculated based on EU countries only. For non-EU countries like Iceland and Norway no data is available. It is estimated that data from outside the EU will only slightly affect the overall figures. Most countries report the degradation in quality to be caused from a combination of abiotic degradation and biotic losses.

### 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	NT	DD	DD	DD	LC	LC	LC	VU	DD	DD	DD	DD	DD	DD	DD	DD	DD
EU28+	NT	DD	DD	DD	LC	LC	LC	VU	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	C/D1	Vulnerable	C/D1

### Confidence in the assessment

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

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### Reviewers

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