

B1.3a Atlantic and Baltic shifting coastal dune

Summary

This habitat includes the primary, shifting (so called 'white') dunes of dynamic coastal sands along the Atlantic, North Sea and Baltic coasts. Early pioneers upshore from the strandline catch sand blown from the beach and initiate foredune, then embryo dune, development, stages which may come and go with subsequent storms, or continue to build higher, mobile dunes that move inland, sometimes to enormous size and in distinct ridges with intervening valleys. *Ammophila arenaria* is the widespread dominant in the middle to later stages, a grass especially well equipped to cope with rapid upbuild and continually shifting sands, with *Leymus arenarius* and *Calamagrostis baltica* playing a similar role in colder regions. The vegetation cover on the sharply-draining, nutrient-poor sand is typically open with few, but distinctive, associates, some indicative of the regional temperature contrasts, and some striking fungi. Specialised beetles are also characteristic. Though sensitive to disturbance from tourism, over-stabilisation by tree-planting to protect inland property has been more of a problem and, for maintaining quality, continuing mobility of sediment is essential, a condition hard to attain or tolerate on developed coastlines. Other pressures include sand extraction and coastal infra-structure development.

Synthesis

This habitat reaches the qualification of Near Threatened (NT) because of a strong reduction in quality over the last 50 years (criterion C/D1). For this criterion maximum values reported even reach the Vulnerable category, and it is likely that in the southern parts of the range this category is more applicable. Also the longer historical decrease in area (criterion A3) is relatively high, resulting in the category Near Threatened, but in this case the uncertainty range is closer to the Least Concern category.

Overall Category & Criteria			
EU 28		EU 28+	
Red List Category	Red List Criteria	Red List Category	Red List Criteria
Near Threatened	A3, C/D1	Near Threatened	A3, C/D1

Sub-habitat types that may require further examination

The situation of this habitat is different in the northern countries compared to the southern ones (France, Spain and Portugal mainly) as the touristic pressure is much higher in the latter. Therefore an assessment of a southern sub-habitat would probably result in a more threatened habitat at the EU level (Vulnerable). Alternatively a split between pioneer dunes with *Elymus farctus* and white dunes with *Ammophila arenaria* could be made, like is done in the Annex I types of the Habitats Directive, but this is not likely to have much influence on the Red List result.

Habitat Type

Code and name

B1.3a Atlantic and Baltic shifting coastal dune



Coastal dunes covered by *Ammophila* communities, Côte Atlantique near Soulac-sur-Mer, France (Photo: John Janssen).



Shifting dunes with *Ammophila* and *Elymus* grasslands, Corrubedo, Galicia, Spain (Photo: Mercedes Herrera).

Habitat description

Primary dunes and white dunes along the coasts of the Atlantic Ocean, including the North Sea, and the Baltic Sea. Primary dunes are found on sandy beaches along sedimentary coasts, where plenty of sand is available. They are formed by *Elytrigia farctus*, which is able to catch blowing sand and built up small dunes, in some cases mixed with drift line species (*Cakile maritima*, *Salsola kali*). In the northern Baltic Sea embryonic dunes are formed by *Leymus arenarius* and occasionally also by *Honckenya peploides* or *Agrostis stolonifera*. Such embryonic dunes often last only a year and disappear after severe storms. In sheltered conditions, for examples along expanding coasts, they may however grow higher, outside the influence of salt ground water, until a level where *Ammophila arenaria* is able to establish and to provide more stability to the dunes. Marram grass can develop a very deep root system with which the plant grows higher and higher when overblown by sand. In this way dunes grow up to high ridges, forming the so-called white dunes (named after the soil color which is related to the absence of organic, “grey” material). White dunes have a very open vegetation cover, an alternating relief and form (still) a very dynamic environment (due to wind and salt spray) where few species can survive. In good conditions there is a clear zonation of primary and white dunes, while on very broad, expanding shores even large areas with a mixture of embryonic dunes, drift-line communities and white dunes may develop.

Leymus arenarius and *x Calamagrostis baltica* can have a similar role as *Ammophila* in relatively cold regions, although the white dunes (in fact “black” on volcanic Iceland) don’t grow that high in cold regions. A constant species in all Atlantic and Baltic white dunes is *Festuca arenaria*. Other associated species are *Sonchus arvensis* var. *maritimus*, *Oenanthe oakesiana*, *Honckenya peploides*, in boreal regions *Lathyrus japonicus* and in relatively warm regions *Calystegia soldanella*, *Eryngium maritimum*, *Euphorbia paralias*, *Polygonum maritimum*, and several species more typical for Mediterranean white dunes (see habitat B1.3b). Amongst the more restricted species are *Linaria loeselii* (Baltics), *Pancratium maritimum*, *Linaria thymifolia* and *Hieracium eriophorum* (Southwestern France) and *Galium arenarium* and *Galium neglectum* (Bay of Biscaye and Channel islands).

Besides the relatively low diversity of vascular plants some remarkable fungi grow here, several of them being restricted to coastal dunes. Examples are *Agaricus devoniensis*, *Cyathus stercoreus*, *Hohenbuehelia culmicola*, *Melanoleuca cinereifolia*, *Peziza ammophila*, *Phallus hadriani*, *Psathyrella ammophila* and *Stropharia halophila*.

The fauna of this extreme habitat contains several specialized species of beetle.

Indicators of good quality:

- Natural zonation from embryonic dunes to white dunes, or mosaic of embryonic and white dunes

- Irregular vegetation structure, with open sand
- Irregular, alternating relief (with high ridges and depressions)
- Presence of characteristic fungi
- No disturbance by man
- Absence of erosion patterns

Characteristic species:

Vascular plants: *Agrostis stolonifera*, *Ammophila arenaria*, *Astragalus baionensis*, *Cakile maritima*, x *Calamagrostis baltica*, *Calystegia soldanella*, *Elymus farctus* subsp. *boreoatlantica*, *Eryngium maritimum*, *Euphorbia paralias*, *Festuca arenaria*, *Galium arenarium*, *Galium maritimum*, *Galium neglectum*, *Honckenya peploides*, *Hieracium eriophorum*, *Lathyrus japonicus*, *Leymus arenarius*, *Linaria thymifolia*, *Linaria loeselii*, *Mathiola sinuata*, *Oenanthe oakesiana*, *Pancratium maritimum*, *Polygonum maritimum*, *Silene uniflora* subsp. *thorei*, *Solidago virgaurea* subsp. *macrorhiza*, *Sonchus arvensis* var. *maritimus*

Fungi: *Agaricus devoniensis*, *Cyathus stercoreus*, *Hohenbuehelia culmicola*, *Melanoleuca cinereifolia*, *Peziza ammophila*, *Phallus hadriani*, *Psathyrella ammophila*, *Stropharia halophila*

Classification

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

EUNIS:

B1.3 Shifting coastal dunes

Euroveg Checklist:

Ammophilion Br.-Bl. 1921

Elymion arenarii Christiansen 1927

Agropyro-Honckenyon peploidis Tx. in Br-Bl. et Tx. 1952 nom. mut.

Annex 1:

2110 Embryonic shifting dunes

2120 Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes)

Emerald:

B1.3 Shifting coastal dunes

MAES-2:

Sparsely vegetated land

IUCN:

13.3 Coastal Sand Dunes

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

Yes

Regions

Atlantic

Boreal

Justification

It is distributed in the Atlantic and Boreal regions along the Atlantic, North Sea and Baltic Sea shores. In the boreal region the subhabitat dominated by *Leymus arenarius* is characteristic.

Geographic occurrence and trends

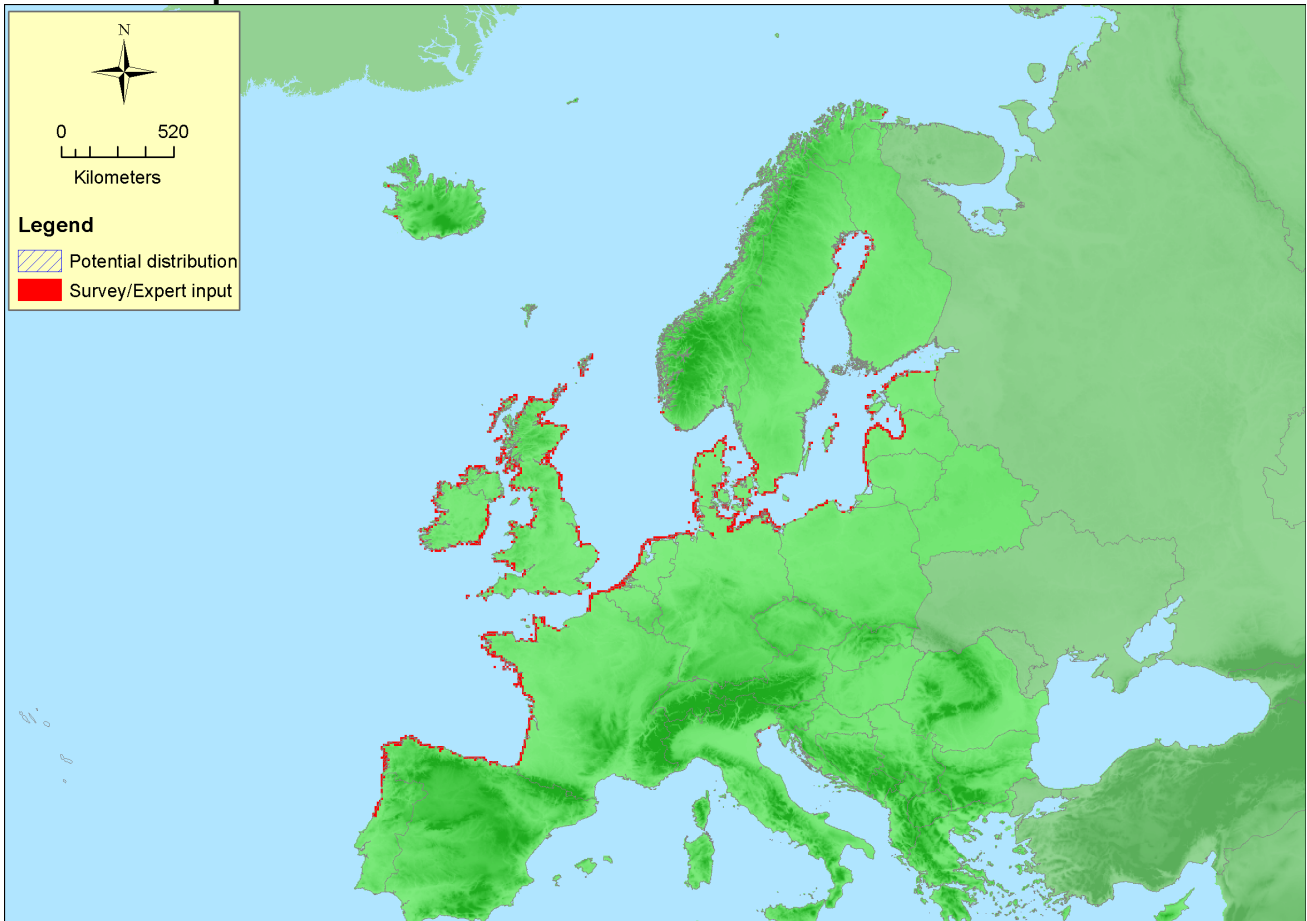
EU 28	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
<i>Belgium</i>	Present	5.6 Km ²	Decreasing	Stable
<i>Denmark</i>	Present	21 Km ²	Unknown	Unknown
<i>Estonia</i>	Present	4 Km ²	Stable	Decreasing
<i>Finland</i>	Aland Islands: Present Finland mainland: Present	1.7 Km ²	Stable	Stable
<i>France</i>	France mainland: Present	190 Km ²	Decreasing	Decreasing
<i>Germany</i>	Present	Unknown Km ²	Unknown	Unknown
<i>Ireland</i>	Present	5.3 Km ²	Stable	Stable
<i>Latvia</i>	Present	7.7 Km ²	Decreasing	Decreasing
<i>Lithuania</i>	Present	8 Km ²	Stable	Decreasing
<i>Netherlands</i>	Present	26 Km ²	Stable	Stable
<i>Poland</i>	Present	25 Km ²	Decreasing	Decreasing
<i>Portugal</i>	Portugal Azores: Present Portugal mainland: Present	7 Km ²	Decreasing	Decreasing
<i>Spain</i>	Spain mainland: Present	2.4 Km ²	Decreasing	Decreasing
<i>Sweden</i>	Present	Unknown Km ²	Unknown	Unknown
<i>UK</i>	Northern Island: Present United Kingdom: Present	25 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>Faroe Islands</i>	Present	Unknown Km ²	Unknown	Unknown
<i>Guernsey</i>	Present	Unknown Km ²	Unknown	Unknown
<i>Iceland</i>	Present	Unknown Km ²	Unknown	Unknown
<i>Isle of Man</i>	Present	Unknown Km ²	Unknown	Unknown
<i>Jersey</i>	Present	Unknown Km ²	Unknown	Unknown
<i>Kaliningrad</i>	Present	Unknown Km ²	Unknown	Unknown
<i>Norway</i>	Norway Mainland: Present	Unknown Km ²	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>	4314750 Km ²	2472	339 Km ²	
<i>EU 28+</i>	6644650 Km ²	2493	339 Km ²	

Distribution map



Map rather complete, with data gaps in Iceland. Data sources: EVA, ART17.

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

Ca 90% of the habitat type is within the EU28, only Norway, Kaliningrad, Iceland and the Channel Islands have a significant representation of it out of EU28.

Trends in quantity

Concerning quantity, there is a clear trend separating the northern countries from those of the south. In the former the trend is stable with quite slight local tendencies to reduction, while in the south, particularly in the Iberian countries, the decrease has been and still is severe. This is mainly due to the development of coastal tourism in the last 100 years, with heavy urbanisation and visitors pressure. This pressures are expected to continue in the future if no measures are taken. Some countries have still large areas of this habitat due to the length and width of their low coasts (Netherlands, France, Poland or UK), while others have much less of it due to a rocky coast. In the latter countries this habitat is much more vulnerable than in the former. The estimated overall trend in the last 50 years is a decrease of 22%.

- 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 the decline in extent has been moderate and has happened mostly in the south.

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

No

Justification

The geographical range of the habitat (EOO) is very wide and the habitat usually occurs as long, linear features parallel to the coastline.

Trends in quality

Quite similarly as in the trends in quantity, the damage in quality, although affecting important areas, is stable in the north, while showing in the south an increasing intensity. This is also due to the development of coastal tourism in the last 100 years and it also is expected to continue if no measures are taken. In any case, the qualitative degradation affects large proportions of the current extent due to the dispersed disturbance taking place nowadays and in the recent past. The current average degraded area for EU28 is 48% with a severity of 52%, as has been calculated from territorial data. However, ranges have been indicated by some countries, and the maximum degradation given results in a calculated extent of 50% and severity of 57%.

- Average current trend in quality

EU 28: Decreasing

EU 28+: Decreasing

Pressures and threats

Main pressures are: 1. Trampling overuse related with outdoor sport and recreational leisure activities (tourism); 2. Urbanisation with building of corridors and parking lots; 3. Construction of dykes, embankments, artificial beaches, sea defense or coast protection works, tidal barrages, etc.; 4. Climate change with the increase of precipitation and the length of the growing season resulting in an increase of fixation and an increase of the erosion of the dunes system resulted from the elevation of the sea level; 5. Invasion of alien species: in the southern countries many dunes are invaded by *Oenothera* sp. pl., *Stenotaphrum secundatum*, *Carpobrotus edulis*, *Conyza* sp. pl., etc., while in the northern regions, *Rosa rugosa* and *Pragmites australis* often invade the dune. In some areas extensive artificial pine plantations have covered substantial areas of this habitat.

List of pressures and threats

Urbanisation, residential and commercial development

Urbanised areas, human habitation

Human intrusions and disturbances

Trampling, overuse

Invasive, other problematic species and genes

Invasive non-native species

Natural biotic and abiotic processes (without catastrophes)

Erosion

Climate change

Sea-level changes

Conservation and management

This habitat is threatened in the context of all the coastal dunes systems particularly in southern Europe: pressure for human use as recreational areas plus pressure for construction of various elements. A general

legislation to prevent construction in a strip of the shoreline should be common to the whole EU, and determining the progressive demolition of any building or built area in this habitat after a period. Other relevant measures are: strict conservation of remaining areas, surveillance and control of the trampling and overuse in visited areas, monitoring to control alien species invasion and programs to remove its populations are required, and cancellation of further artificial pine plantations and progressive logging of the existing trees.

List of conservation and management needs

Measures related to wetland, freshwater and coastal habitats

Restoring coastal areas

Measures related to urban areas, industry, energy and transport

Urban and industrial waste management

Conservation status

Annex 1 types:

2110: ATL U1, BOR U1, MAC U2

2120: ATL U1, BOR U1, MAC U2

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

Naturally this habitat recovers after a few decades, but it depends very much on the proximity of a seeds source. If such is available, natural regeneration is a good option. If the regeneration is on a very disturbed site, the intervention by planting *Ammophila* and/or *Elymus* is recommended, always using regionally collected material to prevent genetic pollution

Effort required

10 years	20 years
Through intervention	Naturally

Red List Assessment

Criterion A: Reduction in quantity

Criterion A	A1	A2a	A2b	A3
EU 28	-22 %	-5/10 %	unknown %	-35/40 %
EU 28+	-22 %	-5/10 %	unknown %	-35/40 %

The calculated trend in the last 50 years is a reduction of about 22% (resulting in category Least Concern). This habitat has suffered historically a much larger reduction in quantity due to human pressure in most of the European countries, particularly in the southern ones. Based on the long-term reduction in quantity provided by several countries (a.o. Spain, Germany, UK, Denmark, Netherlands), and assuming that the reduction in other countries (France) was similar, an overall reduction of 35-40% is calculated for Europe. As the thresholds for longterm changes are relatively high, this figure just leads to a red list category of Near Threatened. The reduction is expected to be smaller in the future, although it still may be relatively large in southern countries.

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 geographic distribution of this habitat is very large across many countries, and EOO and AOO do not meet the thresholds for criterion 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	45-50 %	48-57 %	unknown %	unknown %	unknown %	unknown %
EU 28+	45-50 %	48-57 %	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 the territorial data provided by almost all countries, the reduction in quality over the last 50 years affected between 45-50% (48 on average) of the extent, with a relative severity of 48-57% (52 on average). The maximum figures result in a VU category, the lower figures in NT. Most countries indicated that the reduction is both biotic and abiotic. Insufficient data is given for long historical reduction in quality. Indications for future trends vary a lot, between stable, decrease and unknown. Based on expert opinion the lower category (Near Threatened) is chosen as the final result for this criterion.

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	LC	DD	NT	LC	LC	LC	NT	DD	DD	DD	DD	DD	DD	DD	DD	DD
EU28+	LC	LC	DD	NT	LC	LC	LC	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
Near Threatened	A3, C/D1	Near Threatened	A3, 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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