

B2.1a Atlantic, Baltic and Arctic coastal shingle beach

Summary

These deposits of shingle are most typical of highly dynamic beaches along the Atlantic, Arctic and Baltic coasts, with concentrations along the English Channel. Often mobile and largely bare, they provide an inhospitable environment colonised only in more stable situations, with some deposition of finer material and drift detritus, by a distinctive suite of salt-tolerant and nitrophilous perennial plants. They also provide a habitat suitable for some nesting waders and seabirds and a variety of distinctive invertebrates. Locally, in southern England and the Baltic, larger apposition beaches are more extensively colonised by vegetation. Shingle beaches experience pressures from tourism (trampling), mining (gravel excavation), organic pollution (causing increased productivity of the vegetation) and the construction of sea defenses. Climate change, with more frequent and stronger storms, might be expected to introduce further dynamism into this coastal habitat shifting patterns of erosion and deposition.

Synthesis

None of the thresholds of the Red List are met, resulting in the category Least Concern. There is some concern about the future development of the habitat under increased sea level and stronger and more storms (as a result of global warming), but these prospects could not be expressed in a quantitative way. Anyway, these threats are not expected to cause damage at a scale that would result in any Red List criterion being met and it is impossible to predict where new deposition may occur.

Overall Category & Criteria			
EU 28		EU 28+	
Red List Category	Red List Criteria	Red List Category	Red List Criteria
Least Concern	-	Least Concern	-

Sub-habitat types that may require further examination

Arctic shingle beaches may be considered as a distinct (sub)habitat, as it has a circumpolar distribution and possibly experiences different pressures than shingle deposits in the Temperate region.

Habitat Type

Code and name

B2.1a Atlantic, Baltic and Arctic coastal shingle beach



Shingle beach with *Crambe maritima* near Boulogne sur Mer, northern France (Photo: John Janssen).



Shingle beach between rocky coastal stretches at the Burren, Western Ireland (Photo: Joop Schaminée).

Habitat description

This habitat includes coastal shingle deposits, made up of pebbles or small to medium-sized cobbles, in the Arctic, Atlantic and Baltic region. It includes the higher supralittoral (or geolittoral) part of beaches above mean high tide which do not contain marine plant and animal communities. Such deposits are the result of sedimentation in a high energy environment of relatively coarse material (diameter between 2 and 200 mm) derived from eroded cliffs or glacial moraines. Shingle deposits are mostly found in previously glaciated areas, and are therefore more common along the northern Atlantic and Baltic shores than in the Mediterranean and Black Sea. The majority and the best examples are found on the British and French coasts with 30% of the beaches of England and Wales consisting of shingle.

Variation in shingle deposits depends on geomorphology and coastal location. Typical shingle beaches are steep, because the waves easily flow through the coarse surface of the beach, decreasing the effect of backwash erosion and increasing the formation of sediment. One or two ridges can be noted, which indicate highest and mean tide or more on stormy beaches. The pebbles and cobbles often have been rounded by the wave activity, and the material usually consists of hard rocks, for example quartzite, granite and sandstone. Shores with larger cobbles, boulders or stable rocks are considered under B3.1a Rocky shores and cliffs. A mixture of shores with stones and finer material (shingles) between them is very common on moraine shores and in some locations extensive apposition beaches or cusped forlands develop, where a series of consolidated parallel ridges of shingle structures are formed. Much the largest site (over 2000 ha) is at Dungeness in Kent, southern England but other examples are found at Korshage in Denmark and on the German island of Rügen.

Because of the movement of the pebbles and stones, due to the tidal waves, this is a very dynamic environment where almost no perennial plant species can live but stabilized deposits can trap sand, silt or clay and driftlines with organic material can occur when slightly more abundant but still very open vegetation may develop. On apposition beaches and in the northern Baltic Sea where these shores are derived from moraine with mixed grain size, there are also variants with more abundant vegetation.

Characteristic plant species are mostly perennial, halophytic and nitrophilous and include *Crambe maritima*, *Glauicum flavum*, *Honckenya peploides*, *Beta maritima*, *Rumex crispus* and in the northern regions *Mertensia maritima*, *Leymus arenarius* and *Lathyrus japonicus* (= *L. maritimus*). In the high arctic (Svalbard) typical species of stony beaches are *Mertensia maritima*, *Cerastium alpinum*, *Cochlearia officinalis* ssp. *groenlandica* and *Sagina intermedia*. Where driftlines are deposited, *Cakile maritima*, *Salsola kali* and *Atriplex* species may grow, species also common on sand beaches. In the Baltic region, shores with less rounded stones of variable size occur which are included in this shingle habitat, although they are not shingles in a strict sense. These habitats are common on moraine shores and have an open structure of stones and boulders of different sizes (6-60 cm), with meadow-like patches between them. Vegetation cover is in general less than 50%. Besides more-or-less halophytic species, like *Glaux maritima*, *Centaureum littorale*, *Centaureum pulchellum*, *Agrostis stolonifera* and *Plantago maritima*, also species more characteristic for tall-herb communities are found, like *Phalaris arundinacea*, *Vicia cracca*, *Sonchus arvensis* var. *maritimus*, *Valeriana sambucifolia* ssp. *salina*, *Angelica archangelica* ssp. *litoralis*, *Rumex crispus*, *Plantago major* ssp. *intermedia*, *Tanacetum vulgare* and *Veronica longifolia*. More stabilized shingle deposits with grassland, scrub and woodland are considered under Red List habitats B2.4, B2.5 and B2.6.

Shingle beaches are a hostile environment for most animal species, very dry with extreme fluctuations in temperature. However, some seabirds and waders nest on consolidated shingle and certain specialized invertebrates are associated with this habitat, mainly occurring on the higher, rarely inundated parts, in places where plants grow. The fauna includes a relatively large set of bees (particularly *Bombus* bumble bees), wasps, ants, beetles and spiders, of which several are restricted to this habitat.

Indicators of good quality:

- No disturbance of fauna, including ground breeding birds and resting grey seals
- Presence of rare fauna species
- No intensive trampling or mechanical removing of shingle or vegetation
- Stability of plant populations

Characteristic species :

Flora: *Angelica archangelica* ssp. *littoralis*, *Aster tripolium*, *Atriplex glabriuscula*, *Atriplex laciniata*, *Atriplex litoralis*, *Atriplex prostrata*, *Cakile maritima*, *Cerastium alpinum*, *Cochlearia officinalis* ssp. *groenlandica*, *Crambe maritima*, *Desmazeria marina*, *Eryngium maritimum*, *Glaucium flavum*, *Honkenya peploides*, *Inula crithmoides*, *Isatis tinctoria*, *Lathyrus japonicus*, *Lavatera arborea*, *Linaria vulgaris*, *Mertensia maritima*, *Polygonum maritimum*, *Polygonum raii*, *Sagina intermedia*, *Salsola kali*, *Suaeda fruticosa* (= *S. vera*), *Tripleurospermum maritimum* (= *Matricaria maritima*)

Fauna:

Invertebrates: *Bembidion bipunctatum* (ground beetle), *Dyschirus angustatus* (ground beetle), *Ethelcus verrucatus* (weevil), *Megalesi yatesi* (fly), *Pseudomogoplistes squamiger* (cricket), *Sitticus inexpectus* (spider), *Trichoncus affinis* (spider),

Birds: *Arenaria interpres*, *Haematopus ostralegus*, *Sterna* spp., *Tringa totanus*

Classification

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

EUNIS:

B2.1 Shingle beach driftlines

B2.2 Unvegetated mobile shingle beaches above the driftline

B2.3 Upper shingle beaches with open vegetation

EuroVegChecklist:

Atriplicion littoralis Nordhagen 1940

Salsolo-Minuartion peploidis Tx. ex Br.-Bl. et Tx. 1952

Elymo littorei-Rumicion crispi (Nordhagen 1940) Isermann et Dengler in Isermann 2004

Mertensio maritimae-Honckenyon diffusae Tx. Et Géhu ex Géhu 1998

Annex 1:

1210 Annual vegetation of drift lines (although this habitat type officially considers shingles, it has been interpret much broader for driftline communities)

1220 Perennial vegetation of stony banks

Emerald:

B2.1 Shingle beach driftlines

B2.3 Upper shingle beaches with open vegetation

MAES-2:

Coastal

IUCN:

12.3. Shingle and/or Pebble Shoreline and/or Beaches

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

Yes

Regions

Atlantic

Boreal

Justification

The habitat has its main distribution along Atlantic shores but it is also common in the Baltic Sea and on the Arctic shores.

Geographic occurrence and trends

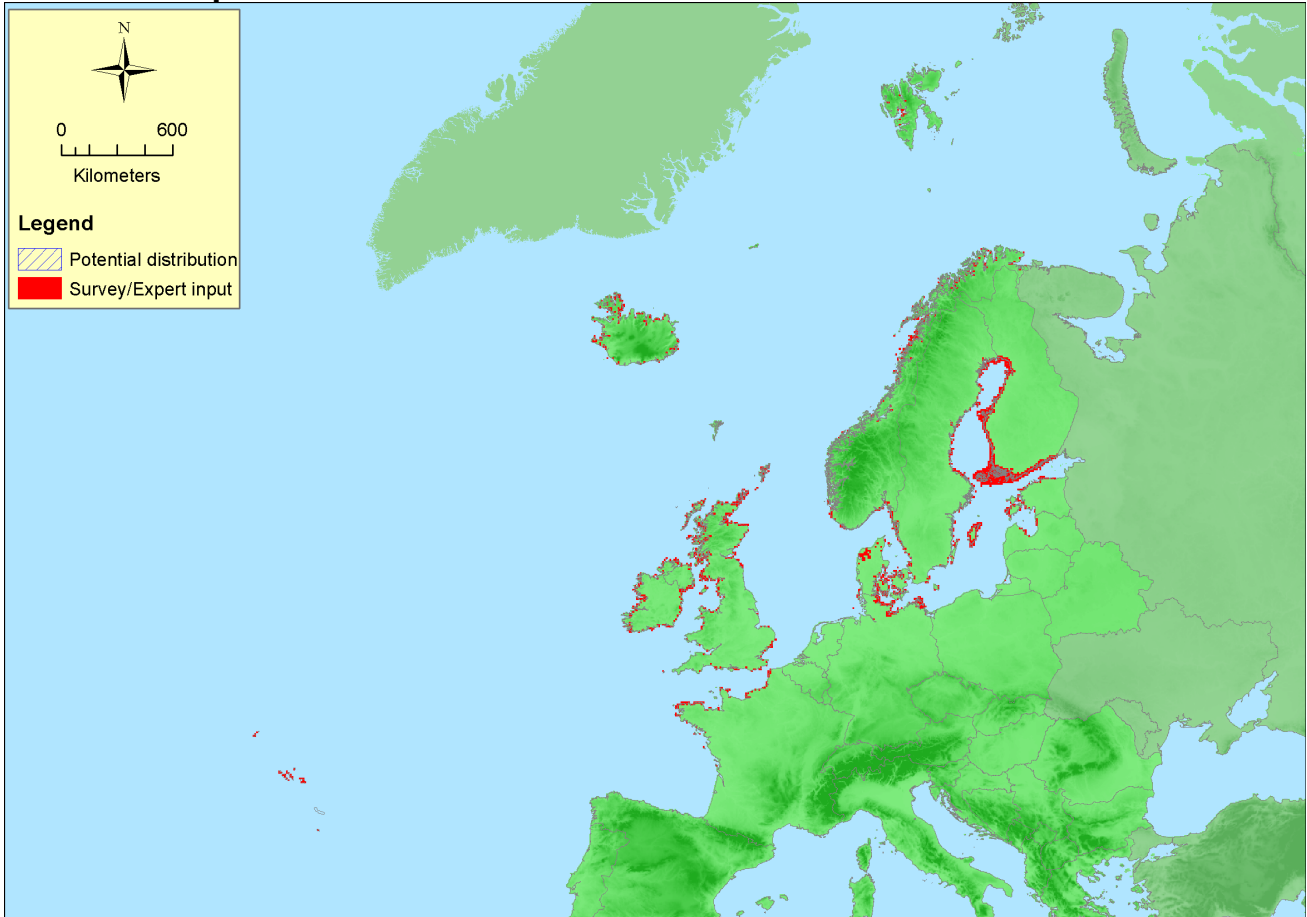
EU 28	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
<i>Denmark</i>	Present	20 Km ²	Unknown	Decreasing
<i>Estonia</i>	Present	10 Km ²	Stable	Unknown
<i>Finland</i>	Aland Islands: Uncertain Finland mainland: Present	25 Km ²	Stable	Stable
<i>France</i>	France mainland: Present	20 Km ²	Decreasing	Decreasing
<i>Germany</i>	Present	unknown Km ²	Decreasing	Decreasing
<i>Ireland</i>	Present	Km ²	Unknown	Unknown
<i>Latvia</i>	Present	0.7 Km ²	Decreasing	Decreasing
<i>Netherlands</i>	Present	marginal Km ²	-	-
<i>Poland</i>	Present	1 Km ²	Decreasing	Decreasing
<i>Portugal</i>	Madeira: Present Portugal Azores: Present Portugal mainland: Uncertain	unknown Km ²	Unknown	Unknown
<i>Spain</i>	Spain mainland: Present	10 Km ²	Unknown	Stable
<i>Sweden</i>	Present	unknown Km ²	-	-
<i>UK</i>	Northern Island: Present United Kingdom: Present	56 Km ²	Stable	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>Guernsey</i>	Uncertain	Km ²	-	-
<i>Iceland</i>	Present	unknown Km ²	Unknown	Unknown
<i>Isle of Man</i>	Uncertain	Km ²	-	-
<i>Jersey</i>	Uncertain	Km ²	-	-
<i>Norway</i>	Jan Mayen: Present Norway Mainland: Present Svalbard: 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
EU 28	4765950 Km ²	1534	170 Km ²	present area and Sweden, Germany
EU 28+	9353550 Km ²	1831	220 Km ²	large area in Norway and Iceland

Distribution map



Map rather complete, but unvegetated shingle beaches may be missing. Data sources: Art17, EVA, GBIF.

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

About 80%. Outside the EU28 the habitat is widely distributed on Iceland and Norway (incl. Svalbard).

Trends in quantity

Six out of 10 countries that reported on the habitat provided quantitative data that enables overall trend analysis. On average for the EU a negative trend in area of 15% was calculated. For the EU28+ countries no data was available, and therefore the same value is applied for the 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 habitat is widespread over the Atlantic, Baltic and Arctic coasts of Europe.
- Does the habitat have a small natural range by reason of its intrinsically restricted area?

Yes

Justification

The area in which the habitat occurs is always small, as it occurs in small, more-or-less linear patches parallel to the coastline.

Trends in quality

Five out of 10 countries that reported on the habitat provided quantitative data that enables overall trend analysis. Some countries reported stable trends (Spain, Finland), some moderate trends (Germany, France). Average values for the EU are a negatively affected area of 22% with moderate severity (35%). For the EU28+ countries no data was available, and therefore the same value is applied for the EU28+. It is likely, however, that the situation in Iceland and Norway is relatively better.

- Average current trend in quality

EU 28: Decreasing

EU 28+: Decreasing

Pressures and threats

The habitat is very dynamic, and changes over one or a couple of years occur due to tidal inundation and storms. Increase of storm number and strength and rising sea level (resulting from global warming) should be considered a threat to this habitat, as it is likely to lead to erosion, though material can be deposited elsewhere along the coast. Presently human pressures are more severe, like building of sea defenses, gravel extraction, tourism (trampling, horseriding) and pollution. In some countries also invasive species and forestry is mentioned as a threat.

List of pressures and threats

Mining, extraction of materials and energy production

Removal of beach materials

Human intrusions and disturbances

Trampling, overuse

Pollution

Pollution to surface waters (limnic, terrestrial, marine & brackish)

Natural System modifications

Sea defense or coast protection works, tidal barrages

Climate change

Flooding and rising precipitations

Wave exposure changes

Conservation and management

This is a natural habitat that best can be managed by reducing negative human impacts (tourism, urbanisation, gravel extraction) as much as possible.

List of conservation and management needs

Measures related to wetland, freshwater and coastal habitats

Restoring coastal areas

Measures related to spatial planning

Establish protected areas/sites

Measures related to special resource use

Regulating/Management exploitation of natural resources on land

Conservation status

Annex I:

1210: ATL U1, BOR U1, CON U1, MAC U1

1220: ATL U2, BOR U1, CON U2, MAC FV

(in some Baltic countries the definition of 1220 includes moraine shores, that are considered under habitat B3.4c in the Red List)

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

It is likely that the habitat can recover from gravel extraction, but in a natural way it may take a long time. Restoration through intervention may be possible, but artificial adding pebbles and gravel to a beach may cause more harm to the biota than leading to restoration.

Effort required

20 years	50+ years
Naturally	Naturally

Red List Assessment

Criterion A: Reduction in quantity

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

Six out of 10 countries that reported on the habitat provided quantitative territorial data, enabling overall trend analysis. The quantitative data cover more than 75% of the reported area. Some countries reported stable trends (UK, Estonia), while a maximum of about 50% decline over the last 50 year was reported by other countries (Latvia, France). On average for the EU a negative trend in area of 15% was calculated. For the EU28+ countries no data were available, and therefore the same value is applied for the EU28+. It is likely, however, that the situation in Iceland and Norway is relatively better. Nearly no quantitative data on long-historical trends is given. It is possible that on the longer time the habitat will suffer from indirect effects of climate change, but no quantitative data are available for the Red List assessment.

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	Unknown	Yes	no	no
EU 28+	>50000 Km ²	Yes	Yes	no	>50	Unknown	Yes	no	no

The AOO and EOO are much larger than the thresholds for B1 and B2, so the habitat does not meet these criteria, even if there is some continuing slightly negative trend in quantity and quality. It is possible (or

even likely) that climate change will have negative effects in future by causing more and stronger storms and leading to increased sea levels. These threats are assessed as more than 5 locations however, as the habitat is widely distributed over different coastal regions.

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	22 %	35 %	unknown %	unknown %	unknown %	unknown %
EU 28+	22 %	35 %	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%

Five out of 10 countries that reported on the habitat provided quantitative data that enables overall trend analysis. Some countries reported stable trends (Spain, Finland), some moderate negative trends (Germany, France). Average values for the EU are a negatively affected area of 22% with moderate severity (35%). For the EU28+ countries no data was available, and therefore the same value is applied for the EU28+. It is likely, however, that the situation in Iceland and Norway is relatively better, leading to a slightly lower negative trend for EU28+.

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	LC	DD	DD	DD	DD	DD	DD	DD	DD	DD
EU28+	LC	DD	DD	DD	LC	LC	LC	LC	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
Least Concern	-	Least Concern	-

Confidence in the assessment

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

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