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Information on the species and habitats around the coasts and sea of the British Isles

Barren littoral shingle

MarLIN – Marine Life Information Network
Marine Evidence–based Sensitivity Assessment (MarESA) Review

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Please note. This MarESA report is a dated version of the online review. Please refer to the website for the most up-to-date version [https://www.marlin.ac.uk/habitats/detail/143]. All terms and the MarESA methodology are outlined on the website (https://www.marlin.ac.uk)

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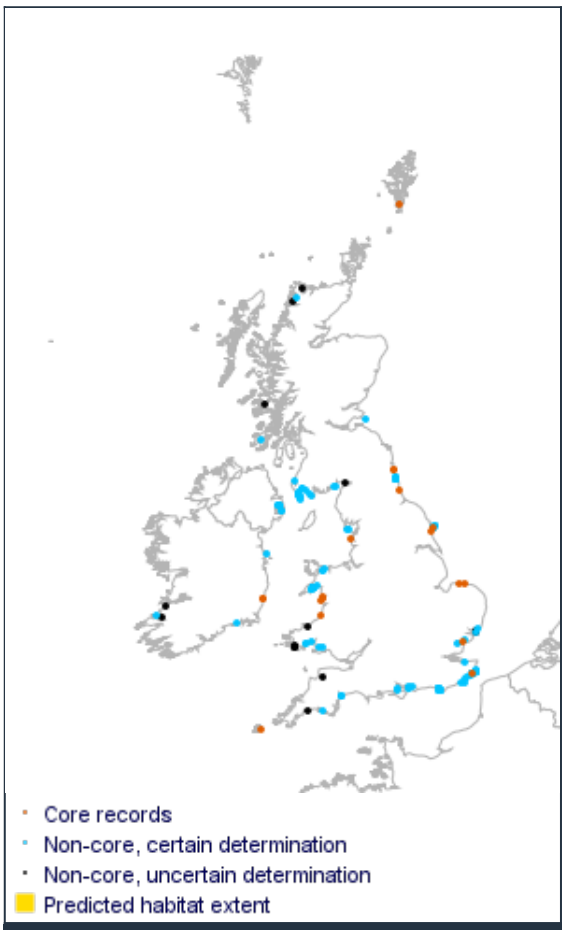
Barren littoral shingle
Photographer: David Connor



17-09-2018
Biotope distribution data provided by EMODnet Seabed Habitats (www.emodnet-seabedhabitats.eu)

Researched by Dr Heidi Tillin **Refereed by** Admin

Summary

UK and Ireland classification

EUNIS 2008	A2.111	Barren littoral shingle
JNCC 2015	LS.LCS.Sh.BarSh	Barren littoral shingle
JNCC 2004	LS.LCS.Sh.BarSh	Barren littoral shingle
1997 Biotope	LS.LGS.Sh.BarSh	Barren shingle or gravel shores

Description

Shingle or gravel shores, typically with sediment particle size ranging from 4 - 256 mm, sometimes with some coarse sand mixed in. This biotope is normally only found on exposed open coasts in fully marine conditions. Such shores tend to support virtually no macrofauna in their very mobile and freely draining substratum. The few individuals that may be found are those washed into the habitat by the ebbing tide, including the occasional amphipod or small polychaete. LS.LCS.Sh.BarSh often extends over the whole shore, sometimes extending into the subtidal zone. BarSh may occur

on the upper shore above BarSa, and in moderately exposed conditions, above AmSco on the lower shore. Tal may occur on the same shore as BarSh, where driftlines of algae and other debris accumulate on the upper shore. There may be a temporary cover of the green seaweeds *Ulva* spp. during periods of stability in the summer. (Information from Connor *et al.*, 2004; JNCC, 2015).

Depth range

Upper shore, Mid shore, Lower shore

Additional information

-

Listed By

- none -

Further information sources

Search on:

G G JNCC

Sensitivity review

Sensitivity characteristics of the habitat and relevant characteristic species

The biotope description is taken from JNCC (2015). Shingle shores tend to support virtually no macrofauna in their very mobile and freely draining substratum. The few individuals that may be found are those washed into the habitat by the ebbing tide, including the occasional amphipod or small polychaete. The sensitivity assessments are therefore based on the abiotic (non-living) habitat.

Resilience and recovery rates of habitat

This biotope is subject to high levels of abrasion resulting from sediment mobility. The species that are present (if any) are robust animals that can withstand some physical disturbance and/or recover rapidly, or migrate as adults into the biotope. The LS.LCS.Sh.BarSh biotope is primarily identified by the type of the substratum rather than the biological community, which may be absent, or if present, occur in extremely low abundance. Therefore the substratum type has been used primarily to indicate the sensitivity of this biotope and no species indicative of sensitivity were chosen.

Resilience assessment. As this biotope is characterized by the absence, rather then the presence of species, recovery is assessed as 'High' for any level of impact. The biotope would be considered to be sensitive to pressures that allowed the establishment of a permanent, species rich biological assemblage as low abundances and low species richness are characteristic of the biotope.

Hydrological Pressures

	Resistance	Resilience	Sensitivity
Temperature increase (local)	High Q: High A: Medium C: NR	High Q: High A: High C: High	Not sensitive Q: High A: Medium C: Low

This biotope is characterized by the absence of species resulting from sediment mobility and abrasion (JNCC, 2015), rather than the presence of typical species: changes in temperature will therefore not alter the biotope (based on the abiotic habitat). Resistance to an increase in temperature is therefore assessed as 'High' and resilience as ‘High’ (by default) and this biotope is considered to be 'Not sensitive'.

Temperature decrease (local)	High Q: High A: Medium C: NR	High Q: High A: High C: High	Not sensitive Q: High A: Medium C: Low

This biotope is characterized by the absence of species resulting from sediment mobility and abrasion (JNCC, 2015), rather than the presence of typical species: changes in temperature will therefore not alter the biotope (based on the abiotic habitat). Resistance to a decrease in temperature is therefore assessed as 'High' and resilience as ‘High’ (by default) and this biotope is considered to be 'Not sensitive'.

Salinity increase (local)	High Q: High A: Medium C: NR	High Q: High A: High C: High	Not sensitive Q: High A: Medium C: Low

This biotope is characterized by the absence of species resulting from sediment mobility and abrasion (JNCC, 2015), rather than the presence of typical species: changes in salinity will therefore not alter the biotope (based on the abiotic habitat). Resistance to an increase in salinity is therefore assessed as 'High' and resilience as 'High' (by default) and this biotope is considered to be 'Not sensitive'.

Salinity decrease (local)	High Q: High A: Medium C: Low	High Q: High A: High C: High	Not sensitive Q: High A: Medium C: Low

This biotope is characterized by the absence of species resulting from sediment mobility and abrasion (JNCC, 2015), rather than the presence of typical species: changes in salinity will therefore not alter the biotope (based on the abiotic habitat). Resistance to a decrease in salinity is therefore assessed as 'High' and resilience as 'High' (by default) and this biotope is considered to be 'Not sensitive'.

Water flow (tidal current) changes (local)	High Q: Low A: NR C: NR	High Q: High A: High C: High	Not sensitive Q: Low A: Low C: Low

Changes in water flow at the pressure benchmark are considered unlikely to lead to alterations in the biotope as wave exposure would still result in sediment mobility, preventing the establishment of a more species rich biotope. Resistance is therefore assessed as 'High' and resilience as 'High' (by default) so that the biotope is considered to be 'Not sensitive'.

Emergence regime changes	Low Q: Low A: NR C: NR	High Q: Low A: NR C: NR	Low Q: Low A: Low C: Low

This biotope occurs from the lower to upper shore and sediment mobility, rather than emergence, is a key factor preventing the establishment of a more species rich biotope. An increase in the emergence period of this biotope would make it even more inhospitable to marine invertebrates. Where the biotope occurs in the supralittoral zone, a reduction in saline spray and splash may favour the colonization of terrestrial plants, which if able fully to establish will have a stabilising effect on the substratum. Consequently, this factor has the potential to alter the biotope. Similarly a decrease in emergence that led to this biotope becoming fully sublittoral would result in reclassification (most likely to the biotope SS.SCS.ICS.SSh). The LS.LCS.Sh.BarSh biotope would not be recognized in either scenario and resistance has therefore been assessed as 'Low'. On return to prior emergence regime sublittoral species that are intolerant of emergence and plants that may have colonized the substratum and which are intolerant to saline splash and spray will probably decline rapidly. Therefore resilience has been assessed as 'High'. This biotope is therefore considered to have 'Low' sensitivity' to changes in emergence.

Wave exposure changes (local)	High Q: High A: Medium C: NR	High Q: High A: High C: High	Not sensitive Q: High A: Medium C: Low

This biotope is found on shores that are judged to be moderately exposed or exposed (JNCC, 2015). The presence of this biotope across these two categories is considered to indicate (by proxy) that increases or decreases in wave exposure at the pressure benchmark are unlikely to lead to alterations to the biotope. Resistance is therefore assessed as 'High' and resilience as

'High' (by default) so that the biotope is considered to be 'Not sensitive'.

Chemical Pressures

	Resistance	Resilience	Sensitivity
Transition elements & organo-metal contamination	Not Assessed (NA) Q: NR A: NR C: NR	Not assessed (NA) Q: NR A: NR C: NR	Not assessed (NA) Q: NR A: NR C: NR

This pressure is **Not assessed** but evidence is presented where available. As this biotope is characterized by the lack of species, exposure to contaminants will not result in significant impacts.

Hydrocarbon & PAH contamination	Not Assessed (NA) Q: NR A: NR C: NR	Not assessed (NA) Q: NR A: NR C: NR	Not assessed (NA) Q: NR A: NR C: NR

This pressure is **Not assessed** but evidence is presented where available. As this biotope is characterized by the lack of species, exposure to contaminants will not result in significant impacts.

Small amounts of oil that can persist for decades in the intertidal zone of coarse-sediment beaches have been documented in a few well-studied cases (Owens et al. 2008). Oil that survives attenuation over the short-term (weeks to months) will persist until there is a change in the environmental conditions, as might occur where there is a seasonal storm-wave climate or as a beach undergoes long-term (erosional) changes. Oil residues can persist on the beach surface as tar mats, asphalt-like pavements, or as veneers on sediment particles or hard surfaces. Subsurface oil residues can persist in similar forms or as fill or partial fill of the pore spaces between coarse-sediment particles. Oil penetrates until it reaches fine-grained sediment, the water table, bedrock, or other penetration-limiting layers. Amounts of persistent oil are very small fractions of the volumes that were originally stranded and these protected residues can continue to biodegrade as they become thinner and more discontinuous.

Synthetic compound contamination	Not Assessed (NA) Q: NR A: NR C: NR	Not assessed (NA) Q: NR A: NR C: NR	Not assessed (NA) Q: NR A: NR C: NR

This pressure is **Not assessed** but evidence is presented where available. As this biotope is characterized by the lack of species, exposure to contaminants will not result in significant impacts.

Radionuclide contamination	No evidence (NEv) Q: NR A: NR C: NR	Not relevant (NR) Q: NR A: NR C: NR	No evidence (NEv) Q: NR A: NR C: NR

Not evidence was found.

Introduction of other substances	Not Assessed (NA) Q: NR A: NR C: NR	Not assessed (NA) Q: NR A: NR C: NR	Not assessed (NA) Q: NR A: NR C: NR

This pressure is **Not assessed**.

De-oxygenation	High Q: Low A: NR C: NR	High Q: High A: High C: High	Not sensitive Q: Low A: Low C: Low

As this biotope is characterized by the lack of species, de-oxygenation will not result in significant impacts. De-oxygenation is unlikely as this biotope is intertidal and exposure to air and tidal flushing is likely to recharge oxygen levels. Biotope resistance is therefore assessed as 'High', and resilience as 'High' (by default) and the biotope is considered to be 'Not sensitive'.

Nutrient enrichment	High Q: Low A: NR C: NR	High Q: High A: High C: High	Not sensitive Q: Low A: Low C: Low

As this biotope is characterized by the lack of species present due to sediment mobility, nutrient enrichment will not result in significant impacts. Biotope resistance is therefore assessed as 'High', and resilience as 'High' (by default) and the biotope is considered to be 'Not sensitive'.

Organic enrichment	High Q: Low A: NR C: NR	High Q: High A: High C: High	Not sensitive Q: Low A: Low C: Low

As this biotope is characterized by the lack of species, organic enrichment will not result in significant impacts. Organic deposits are likely to be removed rapidly by wave action although in periods of calm an organic deposit may be rapidly colonized by oligochaetes or amphipods. Biotope resistance is assessed as 'High' as enrichment is likely to be very short-lived, and resilience as 'High' (by default), the biotope is considered to be 'Not sensitive'.

Physical Pressures

	Resistance	Resilience	Sensitivity
Physical loss (to land or freshwater habitat)	None Q: High A: High C: High	Very Low Q: High A: High C: High	High Q: High A: High C: High

All marine habitats and benthic species are considered to have a resistance of ‘None’ to this pressure and to be unable to recover from a permanent loss of habitat (resilience is ‘Very Low’). Sensitivity within the direct spatial footprint of this pressure is therefore ‘High’. Although no specific evidence is described confidence in this assessment is ‘High’, due to the incontrovertible nature of this pressure.

Physical change (to another seabed type)	None Q: High A: Medium C: NR	Very Low Q: High A: High C: High	High Q: High A: Medium C: Low

This biotope is characterized by coarse sands (JNCC, 2015). A change to a hard or artificial substratum would significantly alter the character of the biotope. The biotope is therefore considered to have 'No' resistance to this pressure (based on a change to a sediment habitat), recovery is assessed as 'Very low', as the change at the pressure benchmark is permanent. Biotope sensitivity is therefore assessed as 'High'.

Physical change (to another sediment type)	None Q: High A: Medium C: Low	Very Low Q: High A: High C: High	High Q: High A: Medium C: Low

The benchmark for this pressure refers to a change in one Folk class. The pressure benchmark originally developed by Tillin *et al*., (2010) used the modified Folk triangle developed by Long (2006) which simplified sediment types into four categories: mud and sandy mud, sand and muddy sand, mixed sediments and coarse sediments. The change referred to is therefore a change in sediment classification rather than a change in the finer-scale original Folk categories (Folk, 1954). The change in one Folk class is considered to relate to a change in classification to adjacent categories in the modified Folk triangle. For shingle habitats a change in one folk class may refer to a change to gravels, mixed sediments or muddy sands, sandy muds and muds. A change in sediment type would result in reclassification of the biotope (JNCC, 2015) and a change to mixed or fine sediments would likely result in the establishment of a species rich and more diverse community (depending on other habitat factors). Biotope resistance is therefore assessed as 'None' and resilience as 'Very low' as the change at the pressure benchmark is permanent. Sensitivity is therefore 'High'.

Habitat structure changes - removal of substratum (extraction)	None Q: High A: Low C: NR	High Q: Low A: NR C: NR	Medium Q: Low A: Low C: Low

The process of extraction will remove the abiotic habitat; therefore a resistance of 'None' is recorded. As the shingle is mobile where small areas are impacted infilling is likely to be rapid following sediment redistribution by wave action. For instance, at Village Bay on St Kilda, an island group far out into the Atlantic west of Britain, an expanse of sandy beach was removed offshore as a result of winter storms to reveal an underlying rocky shore (Scott, 1960). Yet in the following summer the beach was gradually replaced when wave action was less severe. In view of such observations, that many sandy beaches disappear in winter and reappear in spring, it is likely that recovery would occur in less than a year or six months. As a result, resilience is assessed as 'High', and sensitivity as 'Medium'. Recovery where large volumes of shingle are removed over wide areas may lead to slower recovery if sediments are not available and/or water transport is limited.

Abrasion/disturbance of the surface of the substratum or seabed	High Q: High A: Medium C: NR	High Q: High A: High C: High	Not sensitive Q: High A: Medium C: Low

This biotope is characterized by the absence of species through sediment mobility (JNCC, 2015), rather than the presence of typical species: abrasion will therefore not alter biotope character. The highly mobile species present occasionally in this biotope may only be found in extremely low abundance and are not specifically dependent on this biotope. Resistance to this pressure is therefore assessed as 'High' and resilience as 'High' (by default) and this biotope is considered to be 'Not sensitive'.

Penetration or disturbance of the substratum subsurface	High Q: High A: Medium C: NR	High Q: High A: High C: High	Not sensitive Q: High A: Medium C: Low

This biotope is characterized by the absence of species through sediment mobility (JNCC, 2015),

rather than the presence of typical species: abrasion will therefore not alter biotope character. The highly mobile species present occasionally in this biotope may only be found in extremely low abundance and are not specifically dependent on this biotope Resistance to this pressure is therefore assessed as 'High' and resilience as 'High' (by default) and this biotope is considered to be 'Not sensitive'.

Changes in suspended solids (water clarity)	High Q: High A: Medium C: NR	High Q: High A: High C: High	Not sensitive Q: High A: Medium C: Low

This biotope occurs in scoured habitats and it is likely, depending on local sediment supply, that the biotope is exposed to chronic or intermittent episodes of high-levels of suspended solids as local sediments are re-mobilised and transported by wave action. This biotope is characterized by the absence of species through sediment mobility (JNCC, 2015), rather than the presence of typical species: changes in suspended solids will therefore not alter the biotope. Resistance to an increase or decrease in suspended solids is therefore assessed as 'High' and resilience as 'High' (by default) and this biotope is considered to be 'Not sensitive'.

Smothering and siltation rate changes (light)	High Q: High A: Medium C: NR	High Q: High A: High C: High	Not sensitive Q: High A: Medium C: Low

This biotope is characterized by the absence of species through sediment mobility (JNCC, 2015), rather than the presence of typical species: the addition of a single deposit of fine sediments which will be removed by wave action will therefore not alter the biotope. Resistance to this pressure is therefore assessed as 'High' and resilience as 'High' (by default) and this biotope is considered to be 'Not sensitive'.

Smothering and siltation rate changes (heavy)	High Q: High A: Medium C: NR	High Q: High A: High C: High	Not sensitive Q: High A: Medium C: Low

This biotope is characterized by the absence of species through sediment mobility (JNCC, 2015), rather than the presence of typical species: the addition of a single deposit of fine sediments which will be removed by wave action will therefore not alter the biotope. Resistance to this pressure is therefore assessed as 'High' and resilience as 'High' (by default) and this biotope is considered to be 'Not sensitive'.

Litter	Not Assessed (NA) Q: NR A: NR C: NR	Not assessed (NA) Q: NR A: NR C: NR	Not assessed (NA) Q: NR A: NR C: NR

Not assessed.

Electromagnetic changes	No evidence (NEv) Q: NR A: NR C: NR	Not relevant (NR) Q: NR A: NR C: NR	No evidence (NEv) Q: NR A: NR C: NR

Not evidence

Underwater noise changes	Not relevant (NR) Q: NR A: NR C: NR	Not relevant (NR) Q: NR A: NR C: NR	Not relevant (NR) Q: NR A: NR C: NR

Not relevant.

Introduction of light or shading	Not relevant (NR) Q: NR A: NR C: NR	Not relevant (NR) Q: NR A: NR C: NR	Not relevant (NR) Q: NR A: NR C: NR

Not relevant.

Barrier to species movement	Not relevant (NR) Q: NR A: NR C: NR	Not relevant (NR) Q: NR A: NR C: NR	Not relevant (NR) Q: NR A: NR C: NR

Not relevant.

Death or injury by collision	Not relevant (NR) Q: NR A: NR C: NR	Not relevant (NR) Q: NR A: NR C: NR	Not relevant (NR) Q: NR A: NR C: NR

Not relevant' to seabed habitats. NB. Collision by grounding vessels is addressed under surface abrasion.

Visual disturbance	Not relevant (NR) Q: NR A: NR C: NR	Not relevant (NR) Q: NR A: NR C: NR	Not relevant (NR) Q: NR A: NR C: NR

Not relevant.

Biological Pressures

	Resistance	Resilience	Sensitivity
Genetic modification & translocation of indigenous species	Not relevant (NR) Q: NR A: NR C: NR	Not relevant (NR) Q: NR A: NR C: NR	Not relevant (NR) Q: NR A: NR C: NR

This biotope is not characterized by any typical species, those that are present, such as *Bathyporeia* spp. are not translocated and this pressure is therefore considered 'Not relevant'.

Introduction or spread of invasive non-indigenous species	Not relevant (NR) Q: NR A: NR C: NR	Not relevant (NR) Q: NR A: NR C: NR	Not relevant (NR) Q: NR A: NR C: NR

The high levels of abrasion resulting from movement of shingle and the subsequent sediment instability will limit establishment of all but the most highly scour resistant invasive non-indigenous species (INIS) and no direct evidence was found for effects of INIS on this biotope. The low levels of water and organic matter retained by this biotope, are considered to additionally inhibit permanent colonization by invasive species.

Sensitivity assessment. Overall, there is no evidence of this biotope being adversely affected by non-native species. Resistance is therefore assessed as 'High', and resilience as 'High' (by default), and the biotope is considered to be 'Not sensitive'.

Introduction of microbial pathogens	Not relevant (NR) Q: NR A: NR C: NR	Not relevant (NR) Q: NR A: NR C: NR	Not relevant (NR) Q: NR A: NR C: NR

As this biotope is characterized by the absence of a biological assemblage apart from occasional and ephemeral presence of amphipods or other species deposited by an ebbing tide (JNCC, 2015), this pressure is considered to be 'Not relevant'.

Removal of target species	Not relevant (NR) Q: NR A: NR C: NR	Not relevant (NR) Q: NR A: NR C: NR	Not relevant (NR) Q: NR A: NR C: NR

As this biotope is characterized by the absence of a biological assemblage apart from occasional and ephemeral presence of amphipods or other species deposited by the ebbing tide (JNCC, 2015), this pressure is considered to be 'Not relevant'.

Removal of non-target species	Not relevant (NR) Q: NR A: NR C: NR	Not relevant (NR) Q: NR A: NR C: NR	Not relevant (NR) Q: NR A: NR C: NR

As this biotope is characterized by the absence of a biological assemblage apart from occasional and ephemeral presence of species deposited by an ebbing tide (JNCC, 2015), this pressure is considered to be 'Not relevant'.

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