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

Barren and/or boulder-scoured littoral cave walls and floors

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

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A report from:
The Marine Life Information Network, Marine Biological Association of the United Kingdom.

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/1074]. All terms and the MarESA methodology are outlined on the website (https://www.marlin.ac.uk)

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Barren and/or boulder-scoured littoral cave walls and floors
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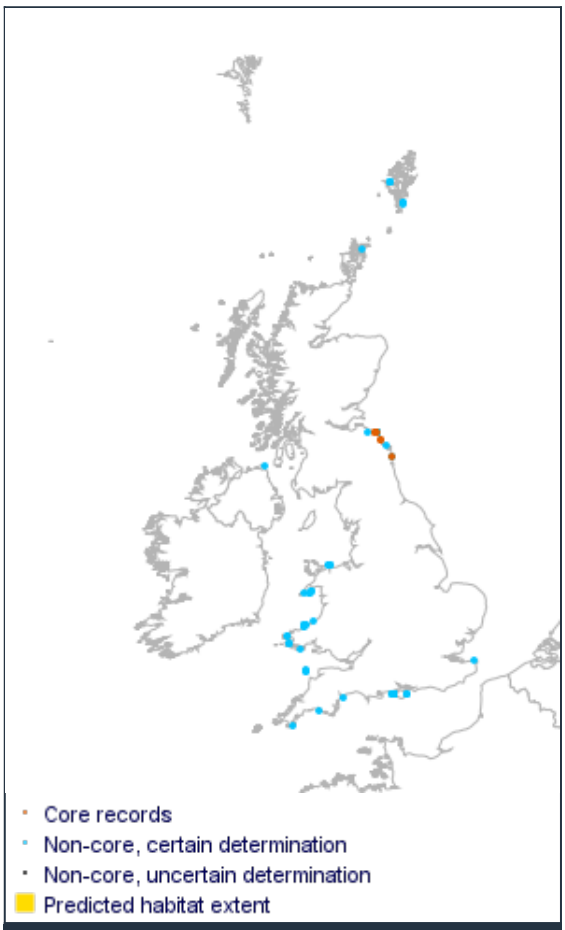

17-09-2018
Biotope distribution data provided by EMODnet Seabed Habitats (www.emodnet-seabedhabitats.eu)

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

Summary

UK and Ireland classification

EUNIS 2008	A1.44A	Barren and/or boulder-scoured littoral cave walls and floors
JNCC 2015	LR.FLR.CvOv.BarCv	Barren and/or boulder-scoured littoral cave walls and floors
JNCC 2004	LR.FLR.CvOv.BarCv	Barren and/or boulder-scoured littoral cave walls and floors
1997 Biotope		

Description

Mid and upper shore mobile boulders/cobbles on cave floors and the lower reaches of cave walls which are subject to scour are generally devoid of macro-fauna and flora. However, where light is available around the cave entrances, encrusting coralline algae may cover the rock and boulder surfaces. In some instances they may support sparse fauna such as the limpet *Patella* spp. and the winkle *Littorina saxatilis* (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 and characterizing species is taken from JNCC (2015). This biotope is generally barren although some encrusting corallines may grow where light levels allow at the cave entrance. Mobile grazers such as *Patella vulgata* and *Littorina saxatilis* may migrate into the biotope and benefit from shelter and shading. Where light penetration allows algal films or summer growth of Ulva may develop, providing food to the grazers. The biotope is characterized by very sparse fauna ather than the presence of typical species and the loss of these species would not be considered to alter the character of this biotope. the sensitivity assesments therefore focus on the abiotic habitat.

Shade and abrasion resulting from scouring by sand and pebbles are key factors structuring the biotope and significant alteration to these is likely to change the character of the biotope. Where pressures may alter these factors, this is identified and discussed within the sensitivity assessments.

Resilience and recovery rates of habitat

This biotope is subject to high levels of physical disturbance from abrasion. 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. 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 boulder scour and shade (JNCC, 2015), rather than the presence of typical species: changes in temperature will therefore not alter the biotope. 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 through boulder scour and shade (JNCC, 2015), rather than the presence of typical species: changes in temperature are therefore unlikely to alter the biotope. Resistance to an 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 through boulder scour and shade (JNCC, 2015), rather than the presence of typical species: changes in salinity are therefore unlikely to alter the biotope. 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: 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 boulder scour and shade (JNCC, 2015), rather than the presence of typical species: changes in salinity will therefore not alter the biotope. Resistance to an 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: 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 boulder scour and shade (JNCC, 2015), rather than the presence of typical species: changes in water flow at the pressure benchmark are not considered likely to alter the biotope. Resistance to an increase or decrease in water flow is therefore assessed as 'High' and resilience as 'High' (by default) and this biotope is considered to be 'Not sensitive'. Boulder scour is a key factor structuring this biotope (JNCC, 2015), a reduction in flow and wave exposure exceeding the pressure benchmark may decrease boulder movement and associated scour allowing more species to colonise the biotope. This change in biotope character could lead to reclassification to LR.FLR.CvOv.ScrFa or an algal dominated cave biotope where light penetration allows.

Emergence regime changes	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 across a range of shore heights and is characterized by the absence of species through boulder scour and shade (JNCC, 2015), rather than the presence of typical species: changes in emergence are, therefore, not considered to alter the biotope (unless the classification changes to sublittoral). Resistance is therefore assessed as 'High' and resilience as 'High' (by default) and this biotope is considered to be 'Not sensitive'.

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 characterized by the absence of species through boulder scour and shade (JNCC, 2015), rather than the presence of typical species: changes in wave exposure at the pressure benchmark are not considered likely to alter the biotope. Resistance to an increase or decrease in wave exposure at the pressure benchmark is therefore assessed as 'High' and resilience as 'High' (by default) and this biotope is considered to be 'Not sensitive'. Boulder scour is a key factor structuring this biotope (JNCC, 2015), a reduction in flow and wave exposure exceeding the

pressure benchmark may decrease boulder movement and associated scour allowing more species to colonise the biotope. This change in biotope character could lead to reclassification to LR.FLR.CvOv.ScrFa or an algal dominated cave biotope where light penetration allows.

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.

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

No 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**. As this biotope is characterized by the lack of species, exposure to contaminants will not result in significant impacts.

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

As this biotope is characterized by the lack of species, de-oxygenation 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'.

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

As this biotope is characterized by the lack of species, 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: High A: Medium C: High	High Q: High A: High C: High	Not sensitive Q: High A: Medium C: High

As this biotope is characterized by the lack of species, organic 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'.

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: High C: High	Very Low Q: High A: High C: High	High Q: High A: High C: High

This biotope is characterized by the hard rock substratum and cave topgraphy. A change to a sedimentary 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'. As this biotope is found in caves, a change in topography from a cave to an open rock surface would also result in the loss of the biotope.

Physical change (to another sediment type)	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 biotopes occurring on bedrock.

Habitat structure changes - removal of substratum (extraction)	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 species characterizing this biotope are epifauna or epiflora occurring on rock and would be

sensitive to the removal of the habitat. However, extraction of rock substratum is considered unlikely and this pressure is considered to be 'Not relevant' to hard substratum habitats.

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 boulder scour and shade (JNCC, 2015), rather than the presence of typical species: abrasion 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'.

Penetration or disturbance of the substratum subsurface	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 species characterizing this biotope group are epifauna or epiflora occurring on rock which is resistant to sub-surface penetration. The assessment for abrasion at the surface only is therefore considered to equally represent sensitivity to this pressure.

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

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-mobilized and transported. This biotope is characterized by the absence of species through boulder scour and shade (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 boulder scour and shade (JNCC, 2015), rather than the presence of typical species: the addition of a single deposit of fine sediments which will be removed by scour 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 boulder scour and shade (JNCC, 2015), rather than the presence of typical species: the addition of a single deposit of fine sediments which will be removed by scour 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 relevant.

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	High Q: High A: Medium C: NR	High Q: High A: High C: High	Not sensitive Q: High A: Medium C: Low

Light penetration is a key factor structuring the cave biotope. Encrusting corallines and other shade-tolerant algae such as *Ulva* grow close to the entrance where light availability allows. Encrusting corallines can occur in deeper water than other algae where light penetration is limited. Samples of *Lithophyllum impressum* suspended from a raft and shaded (50-75% light reduction) continued to grow over two years (Dethier, 1994). An increase in light in the spectrum that supports photosynthesis may allow algae including *Rhodochorton purpureum* and *Pilinia maritima* which are found within caves (Connor *et al*., 2004) to colonise more surface area, altering the structure of the biotope. However, the presence of these species will be limited by the high levels of boulder scour (JNCC, 2015).

Sensitivity assessment. An increase in light levels in the spectrum that supports photosynthesis may increase algal growth altering the character of the biotope. Some specialist cave species may colonize depending on the presence of source populations. However, the high levels of boulder scour experienced by this biotope are likely to limit establishment, the biotope is therefore considered to have 'High' resistance and 'High' resilience and is therefore considered to be 'Not sensitive'.

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 coralline crusts, limpets and littorinids are not translocated and this pressure is therefore considered 'Not relevant'.

Introduction or spread of invasive non-indigenous species	High Q: High A: High C: High	High Q: High A: High C: High	Not sensitive Q: High A: High C: High

The high levels of boulder scour in this biotope 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 light within this biotope, particularly the rear walls of caves, are considered to additionally inhibit invasive algal species.

Sensitivity assessment. Overall, there is no evidence of this biotope being adversely affected by non-native species and scouring of this biotope by boulders prevents establishment of native species and INIS. 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 largely seasonal spatfalls, algal growth and adult grazers that migrate in and out of the biotope, 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 largely seasonal spatfalls, algal growth and adult grazers that migrate in and out of the biotope, 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 largely seasonal spatfalls, algal growth and adult grazers that migrate in and out of the biotope, this pressure is considered to be 'Not relevant'.

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