



UK Biodiversity Action Plan Priority Habitat Descriptions

Intertidal Underboulder Communities

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Intertidal Underboulder Communities

Correspondence with existing habitats

- UK BAP broad habitat: Littoral rock
- May be component part of Annex I habitats
- LR.MLR.BF.Fser.Bo; IR.MIR.KR.Ldig.Bo at least – see note below

Description

This habitat is found from the mid-shore down to the extreme lower shore, and encompasses areas of boulders (greater than 256mm diameter) that support a diverse underboulder community. The underboulder habitat, along with fissures, crevices and any interstitial spaces between adjacent boulders, form a series of microhabitats that add greatly to the biodiversity of a shore. The presence of boulders on a shore may also lead to local modification to wave exposure, current strength and levels of trapped organic matter in the area surrounding the boulders themselves. Altering the physical environment in this way results in an enhancement to the immediate biodiversity beyond the boulders themselves. This habitat can occur on a variety of substrata (including bedrock, mixed rock and sediment or mud), but there needs to be a sufficient gap on the underside of the boulder to support an under-boulder community. The richest underboulder communities are often found where there is running seawater (for instance, from pools or lagoons emptying after the tide has fallen). Boulders with a limited underboulder community are not included in this UK BAP habitat, as may occur for example where boulders are embedded in sediment, in low salinity conditions, and where boulders experience high levels of mobility and scour.

Underboulder habitat provides an environment of shade, moisture and shelter. The undersides of boulders can therefore sustain a diverse collection of animals needing these conditions to survive on an otherwise hostile shore. Underboulder communities are generally dominated by an encrusting fauna of sea mats (bryozoans), sponges (Porifera), sea squirts (ascidians), barnacles, coat-of-mail shells (chitons) and calcareous tube worms (polychaetes). Crustaceans such as the hairy porcelain crab *Porcellana platycheles*, the long-clawed porcelain crab *Pisidia longicornis*, other small crabs and squat lobsters shelter on the undersides of boulders together with scale worms and brittle stars. Herbivores include the top shells *Gibbula* spp., the winkle *Littorina littorea*, the cushion star *Asterina gibbosa* and the green sea urchin *Psammechinus miliaris*. Encrusting sponges can be predated upon by sea slugs such as the sea-lemon *Archidoris pseudoargus*, as are colonial sea squirts by the cowrie, *Trivia monacha*. Encrusting coralline algae are also found on the undersides of the boulders. The bulbous encrusting bryozoan *Turbicellepora magnicostata* is only recorded in the British Isles in the Isles of Scilly where it is largely restricted to underboulder habitat. Like other examples of hard substrata, the species composition of the upward face of boulders varies with a number of factors – geology, wave exposure, tidal strength and position on the shore, etc.

Underboulder habitat plays an important role in the life cycle of marine animals, for example the undersurfaces are an important refuge for the eggs of fish, dog whelks and sea slugs. The sheltered gaps between and under the boulders provide security for mobile species such as larger crabs and fish, and also the juveniles of many more species.

Whilst boulders are widespread around the UK coast, only a component of these support a diverse underboulder community.

Summary of environmental preferences:

Salinity	Fully marine – variable salinity
Wave exposure	Exposed, moderately exposed and sheltered shores
Tidal streams	From moderate to strong
Substratum	Boulders overlying bedrock, mixed substrata and muddy sediment
Zone/depth	From the mid-eulittoral to the sublittoral fringe.

Illustrative biotopes

- LR.MLR.BF.Fser.Bo – *Fucus serratus* and under-boulder fauna on exposed to moderately exposed lower eulittoral boulders
- IR.MIR.KR.Ldig.Bo – *Laminaria digitata* and under-boulder fauna on sublittoral fringe boulders

Both these biotopes correlate directly with this habitat. However this underboulder habitat can also be associated with other biotopes which occur on boulders on the mid to lower shore.

Current and potential threats

The level of threat this habitat experiences is influenced by ease of access and proximity to dense populations. Consequently, in certain parts of the UK such as Scotland, it is not considered to be under threat.

- *Boulder turning for peelers*: This activity is undertaken as part of bait collection – the seeking of small, ‘soft’ crabs or ‘peelers’. Where boulders are not replaced in their original position, the underboulder community is exposed to desiccation, predation and wave action, whilst the surface cover of seaweed becomes smothered by the displaced boulder.
- *Boulder turning for winkles*: This is where winkles are collected for human consumption, from around and underneath the boulders. Again, boulders may not be replaced in their original position.
- *Public shore visits*: One of the recreational activities to be had on a shore is to turn boulders to see what lives beneath. Chronically elevated levels of recreational disturbance is generally only associated with popular tourist destinations with easy shore access.
- *Water Quality*: De-oxygenation of underboulders and consequent death of underboulder fauna may be caused by anthropogenic organic input (e.g. sewage and agricultural inputs), and also as a consequence of eutrophication. Note that de-oxygenation may also occur naturally from rotting seaweed drift.



Diverse underboulder community including encrusting sponges and the bulbous bryozoan *Turbicellepora magnicostata*. (Image: Keith Hiscock)



Underboulder community of barnacles and bryozoans with the hairy porcelain crab *Porcellana platycheles*. (Image: CCW)

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