



# UK Biodiversity Action Plan Priority Habitat Descriptions

## Mud Habitats in Deep Water

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# Mud Habitats in Deep Water

This habitat description has been adapted from the 1994 UK BAP Action Plan for Mud habitats in deep water and would benefit from an update (<https://webarchive.nationalarchives.gov.uk/20110303150144/http://www.ukbap.org.uk/UKPlans.aspx?ID=41>). The Steering Group associated with the marine BAP review, agreed in 2007 that this habitat would benefit from being split into two subcategories (i.e. coastal subtidal mud and shelf subtidal mud).

## Correspondence with existing habitats

OSPAR habitat: Sea-pen and burrowing megafauna communities

Habitats Directive Annex I: Large shallow inlets and bays

## Description

Mud habitats in deep water (circalittoral muds) occur below 20–30m in many areas of the UK's marine environment, including marine inlets such as sea lochs. The relatively stable conditions associated with deep mud habitats often lead to the establishment of communities of burrowing megafaunal species where bathyal species may occur with coastal species. The burrowing megafaunal species include burrowing crustaceans such as *Nephrops norvegicus* and *Callinassa subterranea*. The mud habitats in deep water can also support seapen populations and communities with *Amphiura* spp.

Burrows and mounds produced by megafauna are prominent features on the surface of plains of fine mud, amongst conspicuous populations of seapens, typically *Virgularia mirabilis* and *Pennatula phosphorea*. These soft mud communities occur extensively throughout the more sheltered basins of sea lochs and voes. As these sites are typically sheltered from wave action, these communities may occur in quite shallow depths (15m). These communities also occur in deep offshore waters of the North Sea, where densities of *N. norvegicus* can reach 68 per 100m<sup>2</sup>, and in the Irish Sea. Other burrowing crustaceans include *Calocaris macandreae*, *C. subterranea* and *Goneplax rhomboides*. The echiuran *Maxmuelleria lankesteri* forms large mounds in some sea loch sites. Epibenthic scavengers include *Asterias rubens*, *Pagurus bernhardus* and *Liocarcinus depurator*. Brittlestars may be present and the infauna can contain populations of polychaetes and bivalves.

Within deep fjordic sea lochs, 'forests' of the nationally scarce tall seapen *Funiculina quadrangularis* can occur, together with the other two species of seapens. However, as *F. quadrangularis* is considered to be a bathyal species which 'intrudes' into sea lochs and fjords, it may only be nationally scarce in inshore waters. The mud is also extensively burrowed by crustaceans, mainly *N. norvegicus*, and the goby *Lesueurigobius friesii* may be present in burrow entrances.

Areas of soft anoxic mud can have extensive bacterial mats of *Beggiatoa* spp. The anoxia may be the result of natural conditions of poor water exchange in some Scottish sea lochs or of nutrient enrichment under fish farm cages. The associated fauna is usually impoverished but scavenging species such as *Asterias rubens* and *Carcinus maenas* are typically present. In extreme conditions of anoxia, little survives except the *Beggiatoa*.

Offshore mud habitats can be characterised by the burrowing urchin *Brissopsis lyrifera* and the brittlestar *Amphiura chiajei* and in certain areas around the UK, such as the northern Irish Sea, this community may also include *N. norvegicus*.

In boreal and Arctic areas of water deeper than 100m, the soft muds are dominated by a community of foraminiferans and hatchett shells *Thyasira* spp. with polychaete worms. There can be thousands of dead foraminiferan tests per square metre.

The most rare deep mud biotope is notable for the very high density of the rare sea squirt [Styela gelatinosa](#) and is known from only one site in the UK: Loch Goil, a Clyde sea loch. Within Loch Goil, the fine mud at 65m has large numbers of solitary ascidians, including *S. gelatinosa*, *Ascidia conchilega*, *Corella parallelogramma* and *Ascidiella* spp along with terebellid worms and the bivalve *Pseudamussium septemradiatum*. This biotope is considered to be an ice age relic.

### Relevant biotopes

The biotopes associated with this habitat (agreed by the UK Marine BAP Review Steering Group (MPLUG, 2007) are:

SS.SMu.CSaMu – Circalittoral sandy mud  
SS.SMu.CFiMu – Circalittoral fine mud  
SS.SMu.OMu – Offshore circalittoral mud

Particular attention focusses on the sub-biotopes that contain important biological communities, for example:

SS.SMu.CFiMu.SpnMeg – Seapens, including *Funiculina quadrangularis*, and burrowing megafauna in undisturbed circalittoral fine mud  
SS.SMu.CFiMu.SpnMeg – Seapens and burrowing megafauna in circalittoral fine mud  
SS.SMu.CFiMu.BlyrAchi – *Brissopsis lyrifera* and *Amphiura chiajei* in circalittoral mud  
SS.SMu.OMu.ForThy – Foraminiferans and *Thyasira* sp. in deep circalittoral fine mud  
SS.SMu.OMu.StyPse – *Capitella capitata* and *Thyasira* spp. in organically-enriched offshore circalittoral mud and sandy mud

### Current and potential threats

- **Demersal fishing:** principally for *Nephrops norvegicus*. *Nephrops* is one of the most important fisheries in Scotland and benthic trawls or pots/creels are the two methods of fishing employed. The use of benthic trawls can result in the removal of non-target species and disturbance to the seabed. Potting for prawns and other crustacea selectively removes some of the burrowing megafauna from deep mud.
- **Marine fish farms:** may have direct effects on mud communities, including smothering and increasing the Biological Oxygen Demand of the mud. Additional effects may result from the discharges of chemicals, some of which are especially toxic to crustaceans.
- **Pollution:** Nutrient enrichment leading to eutrophication can have significant detrimental effects. This can lead to changes in the structure and composition of deep mud communities.
- **Development:** The construction of roads, bridges and barrages may affect the local hydrodynamic and sediment transport regimes of inshore enclosed areas and consequently affect the deep mud substratum.
- **Anchoring:** This can cause physical damage to static megafaunal species such as seapens and *S. gelatinosa*.
- **Offshore oil rigs and other oil installations:** These can cause a variety of disturbance effects such as smothering due to disposal of drill cuttings, localised disturbance of sediments due to anchors and rig feet emplacement and trench digging for pipelines.

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