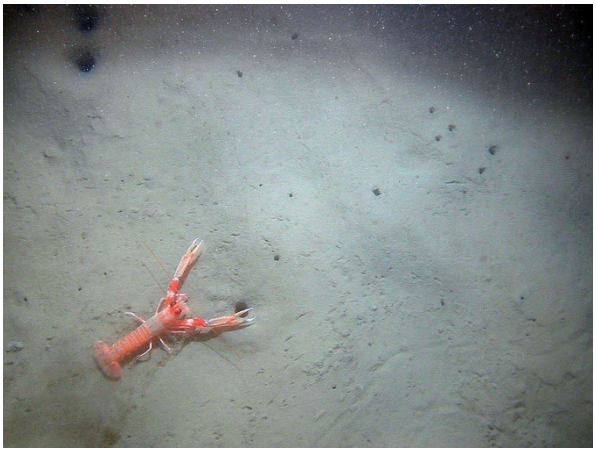
# JNCC clarifications on the habitat definition of the English MCZ Feature of Conservation Importance ‘Sea-pen and burrowing megafauna communities’




**Joint Nature Conservation Committee**

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**Evidence Quality Assurance:**
This document is compliant with JNCC's Evidence Quality Assurance Policy.

# Contents

# 1 Introduction

This document has been prepared as updated advice to the 2014 Joint Nature Conservation Committee (JNCC) clarifications on the definition of the habitat Feature of Conservation Importance (FOCI) 'sea-pen and burrowing megafauna communities' (JNCC 2014). Since 2014, monitoring of this habitat has improved available evidence and understanding of the biological communities that make up this habitat FOCI.

Marine Conservation Zones (MCZs) are a type of Marine Protected Area (MPA) which protect nationally important and unique marine habitats and species in England, Northern Ireland and Wales. The original list of MCZ FOCI was developed in 2010 and outlined in the Ecological Network Guidance (Natural England & JNCC 2010). Each of these habitat FOCI were identified from the OSPAR list of threatened and/or declining species and/or the UK list of Priority Species and Habitats (UK Biodiversity Action Plan – BAP).

The list of MCZ FOCI was reviewed in 2016 after several legislative and policy changes which included the replacement of the UKBAP with the list of habitats and species of Principal Importance (NERC Environment and Rural Communities Act 2006, JNCC & Natural England 2016). While the 'sea-pen and burrowing megafauna communities' FOCI remains, our understanding of the habitat continues to evolve as more evidence is collected.

The 'sea-pen and burrowing megafauna communities' FOCI has similarities to some of the Scottish Priority Marine Features (PMFs) and to support understanding of this habitat some evidence of the sea-pen and burrowing megafauna biotopes from Scottish waters has been used, however the interpretation in this document relates to English MCZ FOCI only. Correlations with biotopes are outlined in Section 2.3.

# 2 Sea-pen and burrowing megafauna communities

## 2.1 Clarification of the OSPAR definition for the English MCZ FOCI

While the MCZ FOCI definition is based on the OSPAR definition for the threatened and declining habitat Sea-pen and burrowing megafauna communities (OSPAR Commission, 2010), this definition was developed in 2008 and our understanding of the habitat type as it occurs within English waters continues to evolve as more evidence is collected from survey. As such, this document provides the following clarifications on the FOCI as it occurs in English waters:

The sea-pen and burrowing megafauna communities FOCI should primarily be identified by the presence of an associated biological community. This may include evidence of the characterising burrowing megafauna and sea-pens, burrowing megafauna without sea-pens, or sea-pens without burrowing megafauna, and includes deeper-water species such as *Kophobelemnon stelliferum* and *Umbellula encrinus*. The sea-pen *Funiculina quadrangularis* may also be present outside of marine inlets. As there is no clear evidence of a hard, biologically relevant boundary between sand and mud in UK waters, where there is clear evidence of the characterising community it can be considered this FOCI irrespective of grain size.

## 2.2 Habitat Parameters

### 2.2.1 Depth range

This habitat typically occurs from depths of 15 m down to the deep sea (depths > 200 m). It may occur in open coast, deep offshore waters, or in sheltered, fully saline environments, and may occur outside its typical depth range where local conditions allow.

### 2.2.2 Sediment composition

The habitat *predominantly* occurs on stable plains of fine muddy sediments, however associated biological communities may also occur in sediments of varying mud content (Murray *et al.* 2016).

Distribution patterns of burrowing megafauna, especially, are linked to mud content, but examples of characteristic species have been shown to occur on a wide range of sediments, depending on local conditions (Murray *et al.* 2016; Clare *et al.* 2019). Additionally, in locations where a sediment veneer is present over a different substrate, epifaunal communities may not match the sediment type as observed from visual evidence (Downie *et al*. 2022; Ferguson & McBreen 2022). As such, **where there is clear evidence of a characterising biological community**, **such habitats can be classified as this FOCI regardless of the grain size composition of the sediment**.

### 2.2.3 Representative Biological Communities

In the context of the English MCZ FOCI, JNCC interpret the OSPAR definition to mean that **biological communities representative of the 'sea-pen and burrowing megafauna communities' FOCI must be present**. With improved knowledge from survey, additional biotopes associated with this habitat have been identified (see Section 2.3). As depth increases, communities may change in their composition to include deeper water species. Component fauna are listed in the OSPAR definition, with additional characterising species of the associated biotopes detailed in their Marine Habitat Classification for Britain and Ireland (MHCBI) descriptions.

Bioturbation is an important process in this habitat, and burrows and mounds are typically prominent on the sediment surface with conspicuous populations of sea-pens. However, several of the larger burrowing megafauna such as *Nephrops norvegicus* are difficult to sample using grab sampling and therefore may not be recorded (Greathead *et al*. 2011). Sea-pens are similarly difficult to sample or may have previously existed but been removed by abrasion pressures (Downie *et al*. 2021). Therefore, **this FOCI may include a range of the component fauna, potentially including:**

- **Burrowing megafauna *and* sea-pens, or**
- **Burrowing megafauna *without* sea-pens, or**
- **Sea-pens *without* burrowing megafauna.**

## 2.3 Biotopes and Correlations

The MHCBI and its European equivalent, the European Union Nature Information System (EUNIS) classification scheme, are comprehensive classification systems that aim to describe the full breadth of physical habitats and biotopes (defined by a combination of biological community and physical habitat) present in the UK and Europe.

Biotopes that are considered to represent sea-pen and burrowing megafauna communities within English MCZs are listed in Table 1. **These biotopes may not exclusively represent** this feature as gaps and variants of biotopes are known to occur, especially in the deep sea where evidence is lacking. **If the evidence does not fully match one of the biotopes but is still similar to the habitat, this evidence must be assessed in more detail** (see Section 2.4). If a biotope different to those listed in Table 1 is thought to represent the habitat, this evidence should be submitted to JNCC for review. If new biotopes are defined that correlate with this habitat, this guidance will be updated.

**Table 1:** Biotopes from the EUNIS classification v2022 in the OSPAR habitat correlation tables 2025 (as correlated within the 2025 OSPAR Habitat Correlation Tables) and MHCBI v22.04 that are 'contained within' sea-pen and burrowing megafauna communities.

| Classification | Biotope code | Biotope name |
|---|---|---|
| EUNIS 2022 | MC6216 | Seapens and burrowing megafauna in Atlantic circalittoral fine mud |
| | MC62161 | Seapens, including *Funiculina quadrangularis*, and burrowing megafauna in undisturbed Atlantic circalittoral fine mud |
| | MC6217 | Burrowing megafauna and *Maxmuelleria lankesteri* in Atlantic circalittoral mud |
| | ME622 | Sea pens and burrowing megafauna on Atlantic upper bathyal mud |
| | ME6221 | *Kophobelemnon* field on Atlantic upper bathyal mud |
| Marine Habitat Classification of Britain and Ireland v22.04 | SS.SMu.CFiMu.SpnMeg | Seapens and burrowing megafauna in circalittoral fine mud |
| | SS.SMu.CFiMu.SpnMeg.Fun | Seapens, including *Funiculina quadrangularis*, and burrowing megafauna in undisturbed circalittoral fine mud |
| | SS.SMu.CFiMu.SpnMegMax | Burrowing megafauna *Maxmuelleria lankesteri* in circalittoral mud |
| | M.AtUB.Mu.SpnMeg | Seapens and burrowing megafauna on Atlantic upper bathyal mud |
| | M.AtUB.Mu.SpnMeg.KopFie | *Kophobelemnon* fields on Atlantic upper bathyal mud |
| | M.AtMB.Mu.SpnMeg | Seapens and burrowing megafauna on Atlantic mid bathyal mud |
| | M.AtMB.Mu.SpnMeg.KopFie | *Kophobelemnon* fields on Atlantic mid bathyal mud |

## 2.4 Additional Considerations

Where the biological community differs from those described by the biotopes listed in Table 1 but is still thought to represent the habitat, or where the sampling techniques used cannot produce a reliable biotope, an assessment of burrowing megafauna and/or sea-pen density is required. JNCC is currently updating the monitoring guidance for this feature, and this document will be updated on completion.

Sea-pen species may include *Virgularia mirabilis*, *Pennatula phosphorea*, *Funiculina quadrangularis*, *Kophobelemnon stelliferum*, or *Umbellula encrinus.* Burrowing

megafauna associated with the habitat produce ‘gallery burrow systems’ and may include, but are not limited to, *Nephrops norvegicus*, *Calocaris macandreae*, *Callianassa subterranea*, or *Maxmuelleria lankesteri.*

Gaps in knowledge on associated biological communities in deep-sea environments persist. Further work is required to assess whether the densities of characterising species typically seen in circalittoral waters apply to the deep-sea, to identify further deep-sea variants in biological community, and to assess how anthropogenic activity alters community composition.

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