



UK Biodiversity Action Plan Priority Habitat Descriptions

Cold-water Coral Reefs

From:

UK Biodiversity Action Plan; Priority Habitat Descriptions. BRIG (ed. Ant Maddock) 2008.

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Cold-water Coral Reefs

This habitat description has been adapted from the OSPAR habitat descriptions (2005) (<http://www.ospar.org/work-areas/bdc/species-habitats>; definition available through the linked text 'case reports') and information extracted from the *Lophelia pertusa* JAMP OSPAR assessment, 2008.

Correspondence with existing habitats

- 1994 UK BAP habitat: *Lophelia pertusa* Reefs (<https://webarchive.nationalarchives.gov.uk/20110303145920/http://www.ukbap.org.uk/UKPlans.aspx?ID=45>)
- OSPAR habitat: *Lophelia pertusa* Reefs
- Habitats Directive Annex I: Reefs

Description

Lophelia pertusa, a cold-water, reef-forming coral, has a wide geographic distribution ranging from 55°S to 70°N, where water temperatures typically remain between 4–8°C. These reefs are generally subject to moderate current velocities (0.5 knots). The majority of records occur in the north-east Atlantic. The extent of *L. pertusa* reefs vary and occur within a depth range of 200m – >2,000m. The species that associate with *L. pertusa* reefs change from one biogeographic province to another with an overall reduction in diversity from south to north coupled with a shift towards a more northern fauna (Hall-Spencer *et al*, 2002, 2007; Roberts *et al*, 2008).

The biological diversity of the reef community can be three times as high as the surrounding soft sediment (ICES, 2003), suggesting that these cold-water coral reefs may be biodiversity hotspots. Characteristic species include other hard corals, such as *Madrepora oculata* and *Solenosmilia variabilis*, the redfish *Sebastes viviparous* and the squat lobster *Munida sarsi*.

The reef-forming coral *Madrepora oculata* often occurs amongst *L. pertusa* reefs which trap sediment and create carbonate-rich deposits to form isolated habitats of high benthic biomass. The reefs commonly harbour abundant sessile suspension feeders and a multitude of grazing, scavenging and predatory invertebrates such as echinoderms (e.g. *Bonellia* sp.), molluscs (e.g. *Acesta oxcavate*), crustaceans (*Pandalus* spp., *Munida* spp.) and echinoderms (e.g. *Cidaris* spp., *Gorgonocephalus* sp.) (Freiwald *et al*, 2004; Hovland, 2008; Roberts *et al*, 2006, 2008). *L. pertusa* reefs occur on hard substrata; this may be *Lophelia* rubble from an old colony or on glacial deposits. For this reason, *L. pertusa* reefs can be associated with iceberg plough-mark zones.

The conservation importance of *L. pertusa* reefs is increasingly recognised, not only because of their longevity and high biodiversity, but also due to potential benefits for commercial fisheries. Although functional relationships have not been demonstrated so far, the reefs are presumed to act as breeding grounds for commercial species such as redfish (*Sebastes* spp.), which hide amongst the complex 3-dimensional structure, and provide hunting territory for demersal predators such as monkfish, cod, ling, saithe and tusk (Husebo *et al*, 2002; Costello *et al*, 2005).

Lophelia pertusa larvae require hard substrata to settle and its reefs mainly occur at depths where temperature varies less than in surface waters, in areas with strong currents and sloping bathymetry which enhance the supply of organic material for reef growth (Frederiksen *et al*, 1992; Duineveld *et al*, 2004; Thiem *et al*, 2006). *Lophelia pertusa* requires temperatures between 4°C and 13°C and salinities of around 35–38psu, with oxygen concentrations >3ml l⁻¹ in waters saturated with aragonite (Freiwald *et al*, 2004; Taviani *et al*, 2005; Dodds *et al*, 2007; Davies *et al*, 2008).

Relevant biotopes

SS.SBR.Crl.Lop – Coral reefs

SS.SBR.Crl.Lop – *Lophelia* reefs

Current and potential threats

- *Fisheries*: Trawling
- *Offshore Industry*: Physical damage from construction and smothering resulting from the associated discharges of drilling mud and drill cuttings.
- *Eutrophication*: Resulting from discharges of land-based activities (Hall-Spencer, University of Plymouth, pers. comm., 2008)
- *Scientific sampling*: Given the slow growth rate of the reefs, they may take centuries to recover from damage, if at all (Hall-Spencer, University of Plymouth, pers. comm., 2008).

References

OSPAR Commission (2008) Case Reports for the OSPAR List of Threatened and/or Declining Species and Habitats

Hall-Spencer, J. (2008) JAMP OSPAR Assessment of *Lophelia* reefs in the OSPAR area and the development of a monitoring programme. Unpublished.



Figure above: *Lophelia pertusa* reef (showing the white and orange colour morphs) at 400m depth off Rost, Norway, the largest cold-water coral reef on Earth. Photograph taken on Polarstern Cruise ARK-XXII © Jago/IFM Geomar 2007.

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