Inshore Special Area of Conservation (SAC): Land's End and Cape Bank

SAC Selection Assessment

Version 2.3

Version Control

Version and date	Amendments made	Issued to and date
2.3 6 August 2010	Text amendment for pSAC to cSAC status	Submission to Europe (9th August 2010).
2.2 14 May 2010	Minor text amendments	Natural England Executive Board (14 May 2010).
2.1 10 May 2010	Text amendments	To Director of Marine and Executive Director of External Affairs for sign off.
2.0 28 April 2010	Amendments following formal consultation	Internal review.
1.0 December 2008	Drafting for approval for Executive Board then Defra	Informal dialogue July 2009 then formal consultation November 2009.

1. Introduction

This document provides detailed information about the Lands End and Cape Bank candidate SAC (cSAC) and evaluates its interest features according to the Habitats Directive selection criteria and guiding principles.

The advice contained within this document is produced to fulfil requirements of Natural England under the Conservation of Habitats and Species Regulations 2010, relating to the conservation of natural habitat types and species through identification of Special Areas of Conservation (SACs) in UK waters. Under these Regulations, Natural England is required to provide advice to Defra to enable the Secretary of State and Competent Authorities to fulfil their obligations under the Regulations.

Sites eligible for designation as Special Areas of Conservation (SACs) are selected on the basis of the criteria set out in Annex III (Stage 1) to the Habitats Directive and relevant scientific information. SACs are considered only if they host a Habitats Directive Annex I habitat or Annex II species. Socio-economic factors are not taken into account in the identification of sites to be proposed to the European Commission[1].

In addition to information on the Annex I habitats, this document contains: i) a map of the site, ii) its name, location and extent, iii) the data resulting from application of the criteria specified in Annex III (Stage 1) to the Habitats Directive and iv) a glossary of terms mentioned in the text. Natural England has adhered to the format established by the Commission for providing site information. This format is set out in the 'Natura 2000 Standard data form' (Commission of the European Community,1995) (prepared by the European Topic Centre for Biodiversity and Nature Conservation on behalf of the European Commission to collect standardised information on SACs throughout Europe).

[1] Following European Court of Justice 'First Corporate Shipping' judgement C-371/98 (7 November 2000)

2. Lands End and Cape Bank: SAC Selection Assessment

1. Site name Lands End and Cape Bank	**2. Site centre location** Degrees and minutes **5° 49' 29.06"W 50° 12' 04.55"N** Decimal degrees **5.82° W 50.2° N** (Datum: WGS84)
3. Site surface area **30,172 ha; 302 sq km** (UTM Zone 30 Northern hemisphere WGS84)	**4. Biogeographic region** Atlantic

3. Interest feature(s) under the EU Habitats Directive

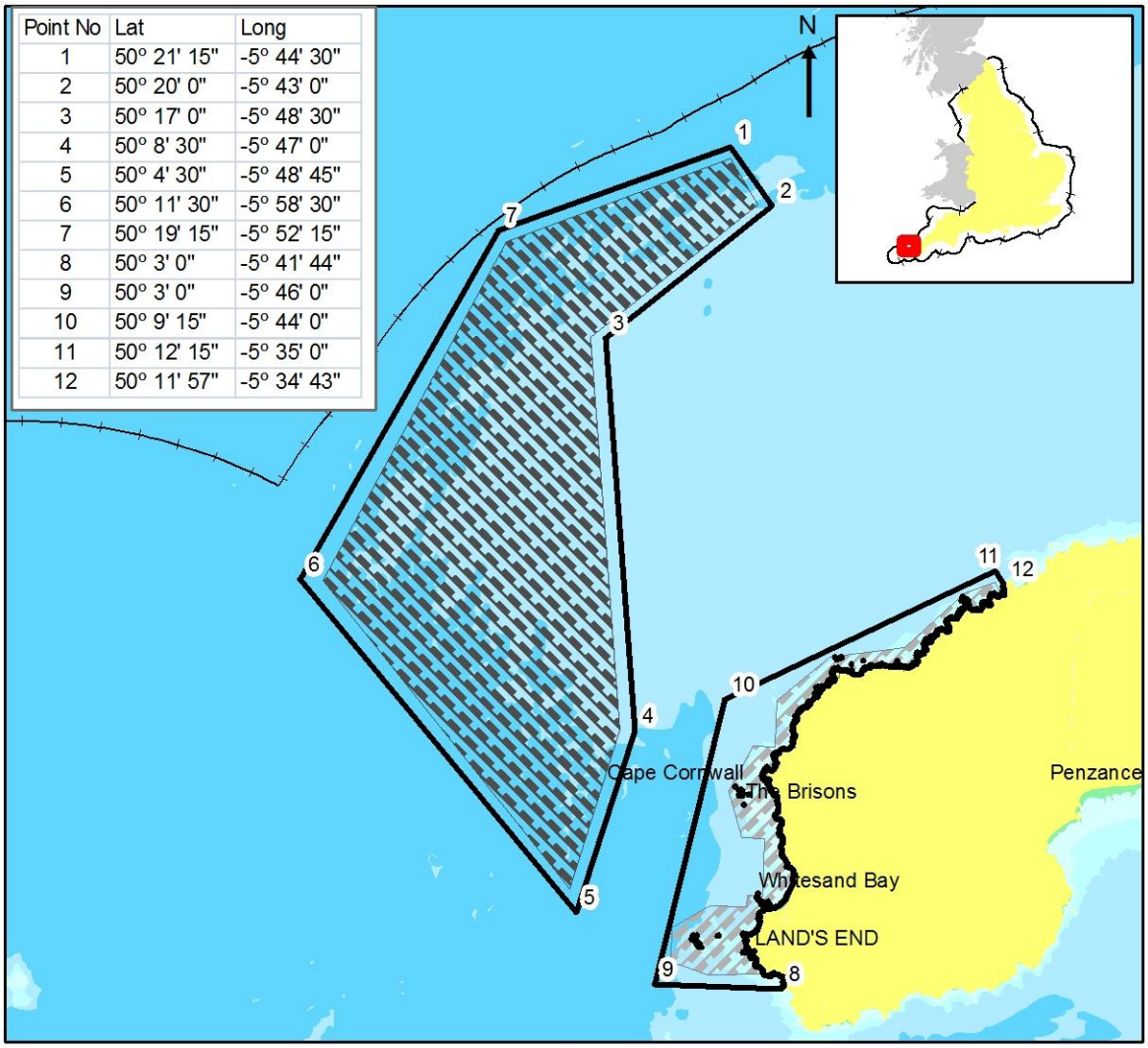
This site is listed for the features set out below. For further information please see European Commission, DG Environment, (2007): Interpretation Manual of European Union Habitats. EUR 27, July 2007:

h*ttp://ec.europa.eu/environment/nature/legislation/habitatsdirective/docs/2007_07_im.pdf*

1170 Reefs.

4. Map of candidate SAC boundary[2]

Point No	Lat	Long
1	50° 21' 15"	-5° 44' 30"
2	50° 20' 0"	-5° 43' 0"
3	50° 17' 0"	-5° 48' 30"
4	50° 8' 30"	-5° 47' 0"
5	50° 4' 30"	-5° 48' 45"
6	50° 11' 30"	-5° 58' 30"
7	50° 19' 15"	-5° 52' 15"
8	50° 3' 0"	-5° 41' 44"
9	50° 3' 0"	-5° 46' 0"
10	50° 9' 15"	-5° 44' 0"
11	50° 12' 15"	-5° 35' 0"
12	50° 11' 57"	-5° 34' 43"



candidate Special Area of Conservation
Lands End and Cape Bank
candidate Special Area of Conservation
England 12nM Territorial Seas Limit
Annex I reefs
Coastal Upstanding Reef
Offshore Upstanding Reef
Depth Areas
Drying
<=10m
<=20m
<=50m
<=100m
Land

EU Site Code: UK0030375
Version number: 1.1
Longitude: 5° 49' 29" W
Latitude: 50° 12' 05"N
Projection: UTM 30N (WGS84)
Area of SAC: 301.72 sq km 30171.73 ha

Theme ID: 1452107
Grid Ref: SW271404
Version: 6.0
Plotted: 22/07/2010
Plot ID: 4.0

Scale 1:300,000 Map 1 of 1
0 1.252.5 5 Kilometers

Candidate Special Area of Conservation Directive 92/43/EEC
Submitted to the EC by the Secretary of State for Environment, Food and Rural Affairs. Date: 20/08/2010

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[2] Larger copies of maps are available on request from Natural England, Regulatory Services, Floor 1 West, Northminster House, Peterborough. PE1 1UA

5. Site summary

5.1 Reefs

The Lands End and Cape Bank site lies to the west of the Land's End peninsula and extends to almost 22 km from the coast. The reefs are fully submarine, upstanding features which are composed almost entirely of granite. The site has two main reef areas, the marginal reefs running along the coast and offshore upstanding reef which extends in a broad, arching crescent roughly aligned with the coastline.

The upstanding rocky reef system in the coastal margin stretches for about 25 km along the coast. There are two prominent features of interest in the southern part; the nearshore islands and the Longships reef off Land's End and "The Brisons" off Cape Cornwall. These features are notable for their topographic complexity, which results in high biological and biotope diversity. The reef is dominated by tide-swept kelp forest and kelp parks with dense foliose red algae.

The crescent shaped system of offshore upstanding rocky reefs forms the major feature of conservation interest at the Lands End and Cape Bank site (Plate 1). It measures about 35 km along its central spine and 12 km at its widest point. The reef is characterised by high biodiversity tide-swept communities such as sponges, faunal and algal turfs and crustose communities.

The site's south westerly position on the British coast means that the sublittoral zone is exposed to the full force of the waves, strong tidal currents and oceanic swells coming in from the Atlantic, as well as experiencing full salinity, given the absence of any major source of fresh water run off from the land.

5.2 Lands End and Cape Bank cSAC Annex 1 Habitat Comparison

The Lands End and Cape Bank cSAC is situated within the Western English Channel and Celtic Sea Regional Sea (Defra, 2004). Listed below are existing SACs within the same area that also contain reefs as a qualifying Annex I habitat. A brief summary of the type of reef at each location is included in table 5.1.

Table 5.1 Regional SACs comprising reef habitat

Site	Description of relevant qualifying features
Isles of Scilly Complex SAC	Hard bedrock reef, both infralittoral and circalittoral, in some cases extending well beyond 50 m depth. Exposure levels vary at this site: some reefs are very exposed, others sheltered. The surrounding waters are full salinity and the feature is subject to minimal coastal influence. The topographic complexity of the reefs is low. The southwesterly position of the islands leads to a range of warm water species being present, including sunset cup-coral *Leptopsammia pruvoti*, pink sea-fans *Eunicella verrucosa*, and Weymouth carpet-coral *Hoplangia durotrix*.
Lundy SAC	A granite and slate reef system, exposed to a wide range of wave action and tidal stream strength. Combined with significant topographical variation, this has resulted in a diverse complex of biological communities. The full salinity reefs are both infralittoral and circalittoral (>50 m depth), and are highly influenced by coastal processes. Several communities at their northern limit of distribution occur here. Fragile long-lived species, such as the soft coral *Parerythropodium coralloides*, sea-fans *Eunicella verrucosa* and erect branching sponges, are present, as are all five British species of cup-coral.

Plymouth Sound & Estuaries SAC	Intertidal and subtidal low energy reefs, including some composed of limestone. This relatively soft rock is extensively bored by the bivalve *Hiatella arctica* and the Spionid worms *Polydora spp*., and harbours a rich fauna. In the sublittoral this steep-sided reef is dominated by a dense hydroid and bryozoan turf interspersed with anemones and ascidians. The sublittoral is of particular importance for its kelp- and animal-dominated habitats. Abundant populations of the slow growing, long-lived, nationally important pink sea-fan *Eunicella verrucosa* also occur at this site. The reef feature is in full salinity and subject to strong coastal influence.
Fal and Helford SAC	The hard bedrock reefs at this site are of low to medium topographic complexity and exist as patches of sublittoral rock (an uncommon habitat within marine inlets). They are subject to strong coastal influence, with parts of the reef experiencing reduced/variable salinity. The energy levels at this site are moderate. Within the marine inlets, sponge and sea squirt communities dominate deep sheltered bedrock reef. On the exposed open coast, dense kelp forests occur in shallower water, along with aggregations of jewel anemones *Corynactis viridis*, and Devonshire cup corals *Caryophyllia smithii*. In some deeper locations, pink sea fans *Eunicella verrucosa* occur. The maximum depth of reef systems in the Fal and Helford is around 30m bcd.

Haig Fras has been submitted to, and approved by, the European Commission and is now a Site of Community Importance. It awaits designation by the UK Government as an SAC.

Site	**Notable characteristics of Reef interest feature**
Haig Fras cSAC	The site is an isolated, fully submarine bedrock outcrop located in the Celtic Sea, 95km north west of the Isles of Scilly. The rocky outcrop is approximately 45 km long and in one area rises to a peak that lies just 38m beneath the sea surface. It is the only substantial area of rocky reef in the Celtic Sea beyond the coastal margin. The rock is granite, mostly smooth with occasional fissures. It supports a variety of fauna ranging from jewel anemones *Corynactis viridis* and Devonshire cup coral *Caryophyllia smithii* near the peak of the outcrop, to encrusting sponges, crinoids and Ross coral *Pentapora foliacea* towards the base of the rock (where boulders surround its edge). The surrounding seabed is approximately 100 m deep.

Natural England are proposing Lizard Point cSAC, Prawle Point to Plymouth Sound and Eddystone cSAC, and Lyme Bay and Torbay cSAC within the Western English Channel and Celtic Sea Regional Sea.

Site	**Notable characteristics of Reef interest feature**
Lizard Point cSAC	Lizard Point is a geologically and topographically complex area consisting of upstanding sublittoral reefs, flat bedrock reefs and rocky shoals, all skirted by a relatively flat basin. The reef is a moderate to high-energy system with the shallowest areas characterised by red algae and small amounts of kelp, the deeper tide swept slopes by anemones, soft corals, hydroids and echinoderms, and the scour tolerant communities at the slope bases. Lizard Point is fairly unique in terms of its underlying geology.

Prawle Point to Plymouth Sound and Eddystone cSAC	The Prawle Point to Plymouth Sound and Eddystone site lies off the south coast of England. The site comprises a mosaic of two areas containing Annex I 'reef' habitat. The reef habitats comprise complex outcropping bedrock, boulders and rocky gullies, fissures, crevices and pinnacles. They support a wide variety of reef fauna and flora commonly showing excellent examples of zonation from the infralittoral down to deeper water communities. The site is known to support some species rarely encountered in south-western waters such as the cushion star *Porania pulvillus*, the slipper lobster *Scyllarus arctus* and the sea fan anemone *Amphianthus dohrnii*. Furthermore, the presence of relatively large numbers of warm-water species, e.g. *Alcyonium glomeratum* and *Holothuria forskali*, in addition to more typical English Channel fauna indicates the area spans across a biogeographical boundary. The site also supports the most extensive and highest density beds of the sea fan *Eunicella verrucosa* and probably the most extensive and widespread colonies of the nationally rare sunset coral *Leptopsammia pruvoti*. The Eddystone Reefs area extends down into deep waters and supports good examples of deeper water reef species (such as the starfish *Porania pulvillus* and the parchment tube worm *Phyllochaetopterus anglicus*) that may not be so frequent on the more common inshore reefs.
Lyme Bay and Torbay cSAC	The Lyme Bay and Torbay site lies off the south coast of England. The site comprised from two areas containing Annex I 'reef' and 'sea cave' habitat. The reefs exhibit a large amount of geological variety, ranging from limestone, cementstone ledges, sandstone outcrops, slates and granites as well as areas of boulder and cobble reef. Biogenic reef features comprising of *Mytilus edulis* reefs also occur within this site. Many of the bedrock reefs exhibit topographic complexity which adds to the habitats created by the features. The sea caves occur in several different rock types, and at levels from above the high water mark of spring tides down to permanently flooded caves lying in the infralittoral zone.

6. Site boundary

The boundary around the Lands End and Cape Bank cSAC has been drawn using the guidance provided by JNCC (2008) and was defined through GIS mapping with further consideration against the guidelines (Appendix 1). The key parts of this guidance are that the site boundary should be defined as simply as possible with a minimum number of straight lines, and should include the minimum area necessary to ensure protection for the Annex I habitat of interest. More complex shapes drawn more tightly around feature of interest are favoured over simple square/rectangular boundaries, to reduce the area of 'non-interest-feature' included within the site boundary. Where it is justified to protect the features of the site from the effects of mobile gear on the seabed at some distance from a vessel on the surface, a margin in proportion to the water depth may be added to the extent of the feature when defining the site boundary.

The two areas of reef within the site are separated by an area of flat-bedrock and stony reef. These features have not been included in the site boundary as they were not as biologically diverse as the upstanding reef areas in terms of biotope composition and their inclusion will not contribute the overall biodiversity of the site.

Closely associated with the main area of offshore upstanding rocky reefs within the Lands End and Cape Bank cSAC are isolated upstanding rocky reef pinnacles to the east and south. These isolated reefs appear to be as topographically complex and as biodiverse as those in the main area of upstanding rocky reef. Although the pinnacles represent obvious points of interest, the area they cover is small and would not add any further interest features to the site and as such they are excluded from the site boundary.

7. Assessment of interest feature(s) against selection criteria

A full explanation of the application of the site selection criteria can be found on JNCC's website at www.jncc.gov.uk/page-4165.

7.1 Reefs

Annex III selection criteria (stage 1A):

7.1.1 Representativity (a)

Upstanding reef occurs along the entire coastal margin (approximately 25 km) of the site, from Gurnard's Head in the north to Lands End in the south. The only significant interruption is at Whitesand Bay where a sandy shore extends for approximately 2 km along the coastline. Data shows this sand does not extend far out to sea and extensive rock outcrops occur within the 20 m depth contour off Whitesand Bay. Both the Longships Reef off Land's End and 'The Brisons' reef off Cape Cornwall are considered part of the coastal margin reef habitat, which is typified by kelp-dominated biotopes.

The offshore upstanding reef extends in a broad, arcing crescent roughly aligned with the present coastline. Starting at about 3 nautical miles (nm) northwest of Land's End, it broadens to about 11 nm offshore and continues arcing in a north and north-easterly direction ending just beyond the Bann Shoal. This is a high-energy circalittoral reef system. The shallower areas support some red algae, but gives way to communities characterised by anemones, soft corals, hydroids and echinoderms. At their base, the rock slopes are characterised by scour tolerant communities, mobile sand and shell gravel tending to accumulate on the flatter surrounding seabed and in the numerous gullies and fissures that contribute to the topographic complexity of the area. Within the reef system there appears to be a series of three or four coast-parallel ridges decreasing in elevation and extent with distance from the shoreline.

The Lands End and Cape Bank site is graded A (excellent representativity)

7.1.2 Area of habitat (b)

The area of Annex I reef habitat enclosed by the site boundary is approximately 24,938 hectares (ha), which is approximately 82 % of the total site area.

An evaluation of relative surface area is approximate as no accurate total extent figure is available for Annex I reef habitat for UK waters. The closest approximation available for the entire resource (bedrock, cobble and biogenic reef) in UK waters is 7,180,000 ha. This total extent figure gives the following thresholds for the grades of this criterion (Commission of the European Community, 1995)

A – extents between 1,077,000 and 7,180,000 ha (15-100% of total resource)
B – extents between 143,600 and 1,077,000 ha (2-15% of total resource)
C – extents less than 143,600 ha (0-2% of total resource)

The site contains less than 1% of the national Annex I reef resource, and is graded C

7.1.3 Conservation of structure and functions (c)

Degree of conservation of structure
Survey information indicates that the biological and physical structure of the upstanding and flat reef areas at Lands End and Cape Bank is intact (Cefas, 2008). It is known that that the area is fished by static gear (crab /lobster pots) on a seasonal basis, mainly from May to November. Some active sets of gear were seen during the survey but no 'ghost pots' were seen and no evidence noted of habitat damage attributable to potting/creel fishing or any other anthropogenic activity. No accumulations of anthropogenic litter were recorded. The area is noted for shipwrecks, and though some hulks were evident along the shore line, none were observed and there was no immediate indication of habitat degradation attributable to shipwrecks.

The Lands End and Cape Bank site is graded I (excellent structure)

Degree of conservation of functions
Seasonal fishing by static gear has occurred in the area over many generations without apparent detriment to its function.

Other activities at the site including scuba diving, angling, pleasure boating (yachting) and other 'adventure sports' are unlikely to have an impact on the area in a detrimental way. Shipping however has the potential to cause environmental damage as despite the many measures provided to promote and assist shipping safety (e.g. lighting, buoys and a traffic separation scheme) accidents still occur leading to pollution and physical wreckage. In the long term, the area seems to be resilient to even major incidents such as the Torrey Canyon, which spilt oil after grounding on the adjacent Seven Stones reef in 1967. In the shorter term, the construction and operation of the Wave Hub off St Ives is likely to increase the amount of shipping traffic using the area and so increases the potential risk of chemical pollution and physical disturbance resulting from chronic and catastrophic events. None of the activities mentioned above have demonstrated detriment to the function of the reef at this time (September 2008).

The Lands End and Cape Bank site is graded I (excellent prospects)

Restoration possibilities
The reef habitats of the Lands End and Cape Bank cSAC have not been demonstrated to be damaged. As the sites has been graded I for both the conservation of structure and the conservation of function sub-criteria, there is no formal requirement to assess the restoration possibilities.

Overall
The overall grade for the conservation of structure and function criterion is grade A (excellent conservation value)

7.1.4 Global assessment (d)

Overall the site represents an excellent example of good quality reef habitat. The suggested grades for Stage 1A criteria are A, C and A respectively.

The site is graded A (**Site holds an outstanding example of the Annex I habitat in a European context)**

7.2 Summary of scores for Stage 1A criteria

	Representativity (a)	Relative surface (b)	Structure and function (c)	Global assessment (d)
Lands End and Cape Bank	**A**	**C**	**A**	**A**

8. Sites to which this site is related

None.

9. Supporting scientific documentation

The most important sources of background information on the biology and geophysical nature of this area are listed in table 9.1 below:

Table 9.1 survey information used to underpin the Selection Assessment.

Reference	Description
DIPPER F, 1981. Sublittoral survey of the Scilly Isles and south Cornwall. Nature Conservancy Council, CSD Report No. 364.	Diver surveys using semi-quantitative recording methods.
HISCOCK K, 1981. South-West Britain sublittoral survey. Final report. Nature Conservancy Council, CSD Report No. 327.	Diver surveys using semi-quantitative recording methods.
CEFAS, 2008. Acquisition of survey data and preparation of Site Briefing Statements for Proposed Marine Special Areas of Conservation within the 0-12 Nautical Mile Zone. Contract report No. FST20/18/03	Two multidisciplinary (acoustic and sampling) surveys were conducted in 2007 as part of work to identify the site boundary. A total of 540 km of acoustic survey lines (sidescan sonar and multibeam bathymetry) were run at the which equated to a coverage of 215 km^2. Digital video and stills data were collected at 27 sites and 12 scallop dredge sites were sampled along with 13 Hamon grabs sites. An inshore survey was also conducted to collect only acoustic and optical data (i.e. sidescan sonar and visual data) on the upstanding shallow inshore reef areas.

NB. In addition to these data sources, data from unpublished surveys held in Marine Recorder has been used.

10. Site overview and conservation interest

The geology of the Land's End peninsula appears relatively simple. It is almost entirely granite which has intruded through older Devonian and Carboniferous 'country' rocks and created an extensive rim of altered and metamorphosed rocks at the margins of the granite and these older rocks are likely to underlie or outcrop on most of the sea bed of Cape Bank.

Much of the coastal margin deepens to 30 m within a kilometre or two of the shore. It includes areas of sand which stretch out from the major bays and as patches between rock outcrops. The resistant headlands and islands are formed of a variety of rock types including granite, metamorphic and volcanic rocks which also form a fringing reef system. The site's south westerly position on the British coast means that the sub-littoral zone is exposed to the full force of the waves and oceanic swells coming in from the Atlantic, as well as experiencing full salinity, given the absence of any major source of fresh water run off from the land.

The outer part of Cape Bank is characterised by at least three sub-parallel, high linear rock ridges which extend for over 20 km in a slightly curving S-NNE trending arc. These ridges sit on a rock platform at a depth of 45 to 55 m and can reach up to 25 m high and be over a kilometre wide with steep slopes and cover over 100 km^2 in total area.

The offshore upstanding rocky reefs areas are the most biodiverse of all rocky reef habitats within the site. The most abundant biotope in this area is *Caryophyllia smithii* and sponges with *Pentapora foliacea*, *Porella compressa* and crustose communities on wave-exposed circalittoral rock (CR.MCR.EcCr.CarSp.PenPcom).

Of the seven reef biotopes in total identified in this offshore upstanding reef area, the three most characteristic biotopes are described in the table below:

Biotope code	Biotope description
CR.HCR.Xfa.CvirCri	Corynactis viridis and a mixed turf of crisiids, Bugula, Scrupocellaria, and Cellaria on moderately tide-swept exposed circalittoral rock.
CR.MCR.EcCr.CarSp	Caryophyllia smithii, sponges and crustose communities on wave-exposed circalittoral rock (Plate 2).
CR.MCR.EcCr.FaAlCr (CR.MCR.EcCr.FaAlCr.Bri)	Faunal and algal crusts on exposed to moderately wave-exposed circalittoral rock occasionally dominated by brittlestars (Plate 3)

The fringing coastal upstanding reefs are characterised by kelp forest of *Laminaria hyperborea*, with an understorey of foliose red, green and brown algae such as *Dictyopteris membranacea*, *Palmaria palmata*, *Delesseria sanguinea* and *Drachiella spectabilis* in the infralittoral zone. The spiny sea star *Marthasterias glacialis* is the most conspicuous member of the epifauna in this zone (Plate 4), although a diverse assemblage of encrusting fauna, including ascidians *Stolonica socialis*, jewel anemones *Corynactis viridis*, and soft corals such as dead-man's fingers *Alcyonium digitatum* is also present. Beyond the kelp-dominated assemblage, Ross coral *Pentapora foliacea* (now *P. fascialis*) and the rockboring sponge *Cliona celata* are present.

Of the nine reef biotopes in total identified in the nearshore upstanding reef area, the two most characteristic biotopes are described in the table below:

Biotope code	Biotope description
IR.HIR.KFaR.LhypR	*Laminaria hyperborea* with dense foliose red seaweeds on exposed infralittoral rock (Plate 5).
IR.HIR.KSed.XKScrR	Mixed kelps with scour-tolerant and opportunistic foliose red seaweeds on scoured or sand-covered infralittoral rock.

11. Photographic plates

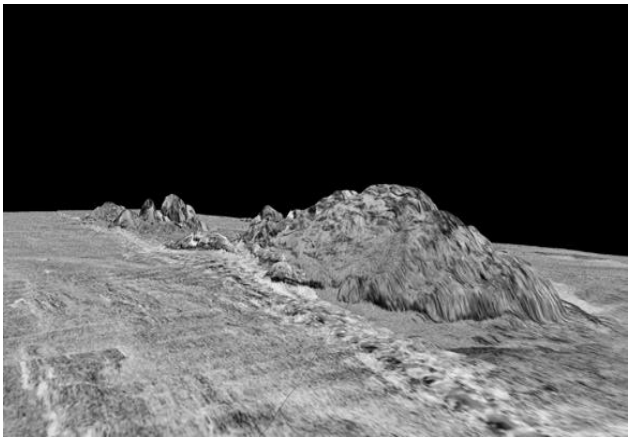

Plate 1: Sidescan sonar data overlain on multibeam bathymetry data, at a pinnacle off Cape Bank.

Plate 2: CR.MCR.EcCr.CarSp, characteristic of offshore upstanding rocky reefs at Cape Bank.

Plate 3: CR.MCR.EcCr.FaAlCr.Bri, characteristic of the offshore upstanding rocky reefs at Cape Bank.

Plate 4: The spiny sea star *Marthasterias glacialis* on faunal turf of hydroids and bryozoans.

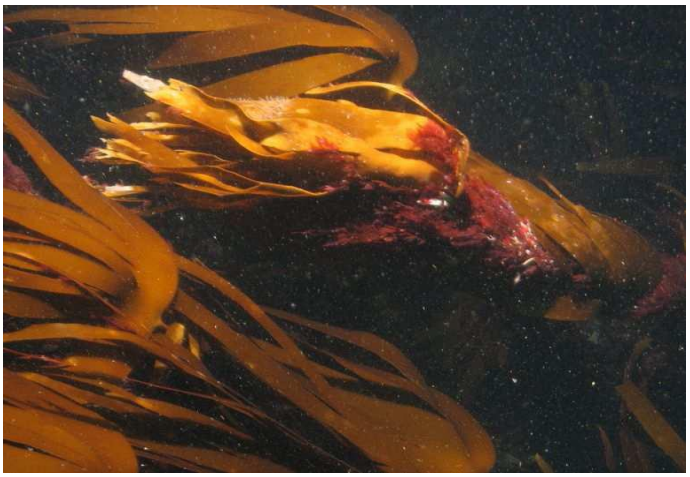

Plate 5: IR.HIR.KFaR.LhypR, characteristic of the fringing coastal upstanding rocky reefs at Cape Bank**.**

Plate 6: IR.HIR.KFaR.FoR, Foliose red seaweeds on exposed lower infralittoral rock.

12. References

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SERAD, 2001. A fishing industry guide to offshore operators. Scottish Executive, Edinburgh, 28pp.

13. Glossary

Biotic Relating to, produced by, or caused by living organisms.

Biotope The physical habitat with its biological community; a term which refers to the combination of physical environment and its distinctive assemblage of conspicuous species.

Bivalves A class of molluscs which are laterally flattened and have a shell made of two hinged valves.

Bryozoans are tiny colonial animals that generally build stony skeletons of calcium carbonate, superficially similar to coral (although some species lack any calcification in the colony and instead have a mucilaginous structure).

Crinoids A class of echinoderms having a cup-shaped body with feathery arms, attached to the substratum, sometimes by a stalk.

Crustose Forming a thin crust on the substratum**.**

Epifauna Animals living on the surface of the seabed.

Foliose Bearing leaves or leaf-like structures.

Fauna Animal life in an area.

GIS Geographic Information System

Habitat The place in which a plant or animal lives.

Hydroids Solitary and colonial animals with a cylindrical body which is closed at one end with a mouth surrounded by tentacles at the other.

Infauna Benthic animals which live within the seabed.

Long lining A commercial fishing technique that uses hundreds or even thousands of baited hooks hanging from a single line.

Open shelf ridge Dyer and Huntley (1999): 'Nearly all shallow tidal seas, where currents exceed about 05 m s^{-1} and where sand is present, have ridges. These can be up to 80 km long, and typically average 13 km width and tens of metres in height. Their spacing tends to be proportional to their width. The bank crests are flat in shallow water, but are sharp when water depth is large enough to limit wave effects.' Examples include South Falls and Indefatigables.

Potting The setting of traps (pots) on the seabed to fish for lobsters, crabs etc.

Shoaling localized shallowing of water.
Static gear Any gear which is set in position and not moved during the fishing process. Examples include:

- Gill nets which are set at or below the surface, on the seabed, or at any depth in-between.
- Setting pots on the seabed to capture lobsters and crabs
- Long lining when a single line is set to capture cod, skate, bass and whiting.

Trawling Towing equipment behind a vessel for commercial fishing principally for cod, plaice and sole. Bottom trawls collect demersal (living on or near the seabed) species and mid-water trawls collect pelagic (living in the water column) species. Examples of towed gears include beam trawls, dredges and trawl nets.

Appendix 1

Guidelines on drawing boundaries (taken from JNCC, 2008)

1 Introduction

Previous UK guidance on defining SAC boundaries states that "as a general principle, site boundaries have been drawn closely around the qualifying habitat types … for which the sites have been selected, taking into account the need to ensure that the site operates as a functional whole for the conservation of the habitat type… and to maintain sensible management units". Further "the seaward boundaries of the sites have been drawn as straight lines, to ensure ease of identification on charts and at sea" (Brown *et al,* 1997, McLeod *et al,* 2005). The guidance presented below is an expansion of previous guidance on defining boundaries for marine SACs, specifically for sites which are not connected to the coastline, and which may be in deep water (200 m to more than 1000 m).

2 Guidance

Actual site boundaries will be determined on a site specific basis, following the general guidance set out below.

2.1 The habitat area of interest will be identified and mapped. In many cases in waters away from the coast, this will involve some form of modelling, such as use of seabed geological data (interpolated from seismic tracks and samples), interpreted sidescan sonar, acoustic and/or bathymetric data.

2.2 The minimum area necessary in order to ensure the essential level of protection for the Annex I habitat of interest will be defined. More complex site shapes drawn more tightly around feature of interest are favoured over simple square/rectangular boundaries (to reduce the area of 'non-interest-feature' included within the site boundary). However, boundaries should still be as simple as possible, using a minimum number of straight lines and vertices. Contrary to previous JNCC boundary guidance (JNCC, 2004) site boundary co-ordinates do not have to be defined by whole degrees and minutes. It is recommended that site boundary coordinates will be provided in degrees, minutes, seconds.

2.3 Where habitat of interest occurs in a number of separate 'pieces' with 'non-interest-feature' habitat between, the preference is to include all 'pieces' within a site boundary to enable effective conservation of the feature of the site and to maintain its ecological function. However, where small, isolated instances of habitat occur at some distance from the main location of the habitat, these may be excluded from the site if their inclusion would result in large areas of 'non-interest-feature' being included within the site boundary.

2.4 The area defined under 2 above may then be extended if necessary in the following circumstances:

i). to ensure an essential level of protection from potentially damaging activities at the site, taking into account water depth at the site and possible location of mobile gear on the seabed in relation to location of a vessel at the sea surface. Activities which are location specific, always subject to prior consent and have clear reliable methods of enforcement are already controlled under existing procedures such as licensing of these activities. Mobile activities which may affect seabed habitats, such as fishing and anchoring, are not subject to prior consent procedures and therefore need special consideration. The length of warp used by boats when trawling is largely determined by water depth. The following table gives the appropriate distance beyond the seabed extent of the habitat by which the site boundary at the sea surface may be extended (based on generalised trawl warp lengths, SERAD, 2001):

Water Depth	Ratio warp length: depth	Approx. length of trawl warp	Boundary extension to be added to the habitat area of interest
Shallow waters (≤ 25 m)	4:1	100 m at 25 m depth	4 * actual depth
Continental shelf (50-200 m)	3:1	600 m at 200 m depth	3 * actual depth
Deep waters (200 to over 1000 m)	2:1	2000 m at 1000 m depth	2 * actual depth

Note that the margin is incorporated as a minimum measure to reduce the likelihood of habitat damage from demersal fishing. However, these boundaries are SAC boundaries, not management boundaries. Ultimately Competent Authorities are responsible for considering which management actions might need to be taken under the Offshore Marine Conservation (Natural Habitats, &c.) Regulations to reduce the risk of damage to the features associated with human activities, whether within or outside the site boundary. As a consequence, future management measure may have different boundaries to the SAC site boundary.

ii). For mobile habitats (for example, sandbanks), to ensure the minimum area necessary to allow conservation of the structure and functions of the habitat. Such extension will be determined on scientific understanding of the structure and functions of the habitat.