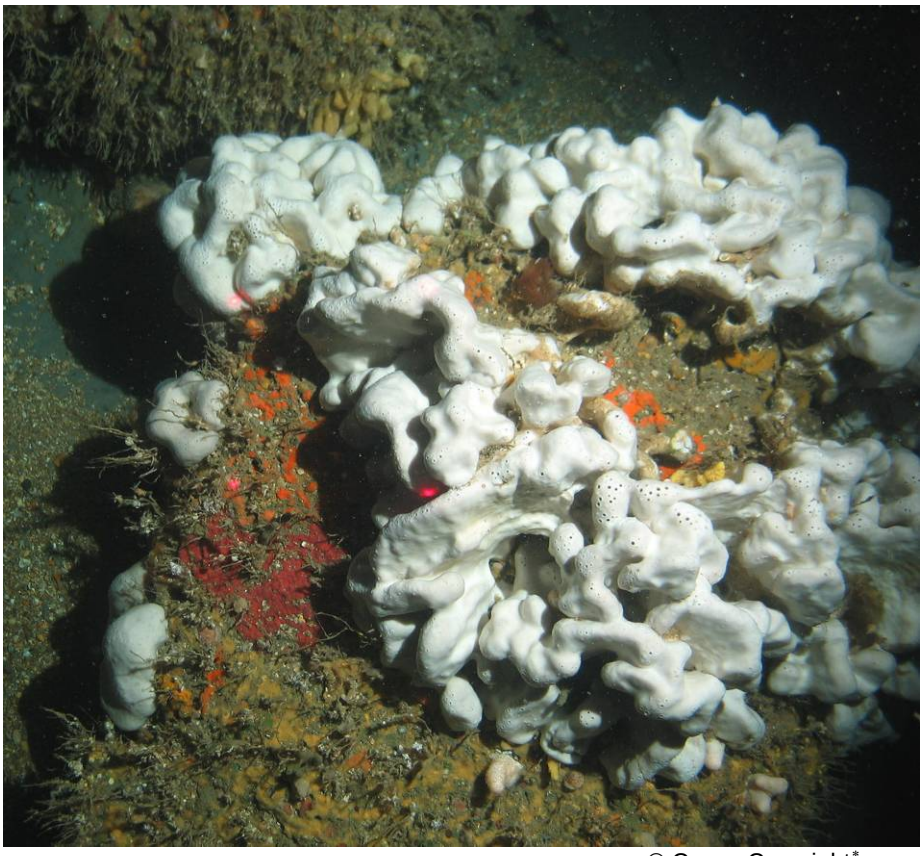
Offshore Special Area of Conservation: Wight-Barfleur Reef

SAC Selection Assessment Document



Version 7.0 (5th September 2012)

* Cover photo illustrates boulders covered with many sponges and tube worms, observed on the Wight-Barfleur reef.

Introduction

This document provides detailed information about the Wight-Barfleur Reef site 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 JNCC under Part 2 of the Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007 (as amended), relating to the conservation of natural habitat types and habitats of species through identification of Special Areas of Conservation (SACs) in UK offshore waters. Under these Regulations, JNCC has an obligation to provide certain advice to Defra to enable the Secretary of State to fulfil his obligations under the Regulations, and to Competent Authorities to enable them to fulfil their obligations under the Regulations.

This document includes information required under Regulation 7 of the Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007 (as amended), to enable the Secretary of State to transmit to the European Commission the list of sites eligible for designation as Special Areas of Conservation (SACs). JNCC have been asked by Defra to provide this information to Government.

Sites eligible for designation as offshore marine SACs are selected on the basis of the criteria set out in Annex III (Stage 1) to the Habitats Directive and relevant scientific information. Sites are considered only if they host a Habitats Directive Annex I habitat or Annex II species. Moreover, sites for Annex II species must contain a clearly identifiable area representing physical and biological factors essential to these species' life and reproduction to be eligible. Socio-economic factors are not taken into account in the identification of sites to be proposed to the European Commission.

In addition to information on the Annex I habitats and/or Annex II species hosted within the site, this document contains i) a chart of the site, ii) its name, location and extent, and iii) the data resulting from application of the criteria specified in Annex III (Stage 1) to the Habitats Directive. This is in line with legal requirements outlined under Regulation 7. JNCC 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' (CEC, 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).

Document version control

Version and date	Amendments made	Issued to and date
SAD SAC Version 7.0 05/09/12	Updated throughout from pSAC to cSAC. Maps updated.	Public (5th September 2012)
SAC SAD version 6.0 08/05/12	Final site recommendation to Government	Defra, Devolved Administrations (8th May, 2012)
SAC SAD version 5.0 01/06/11	Site changed to possible SAC throughout the document	Public consultation (June, 2011)
SAC SAD version 4.0 18/03/11	Edits following comments received from devolved administrations. Re-issued to Government as formal advice.	Defra, Devolved Administrations and other Govt. Departments (18th March, 2011)
SAC SAD version 3.0 24/01/11	Formally advised to Government	Defra, Devolved Administrations and other Govt. Departments (24th January, 2011)
SAC SAD version 2.0 27/5/09	Paper for Joint Committee endorsement	Joint Committee (24th June, 2009)
SAC SAD version 1.0 17/02/09	Paper for JNCC EMB approval	EMB (14th May, 2009)

Further information

This document is available as a pdf file on JNCC's website for download (jncc.defra.gov.uk)

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Wight-Barfleur Reef: SAC Selection Assessment

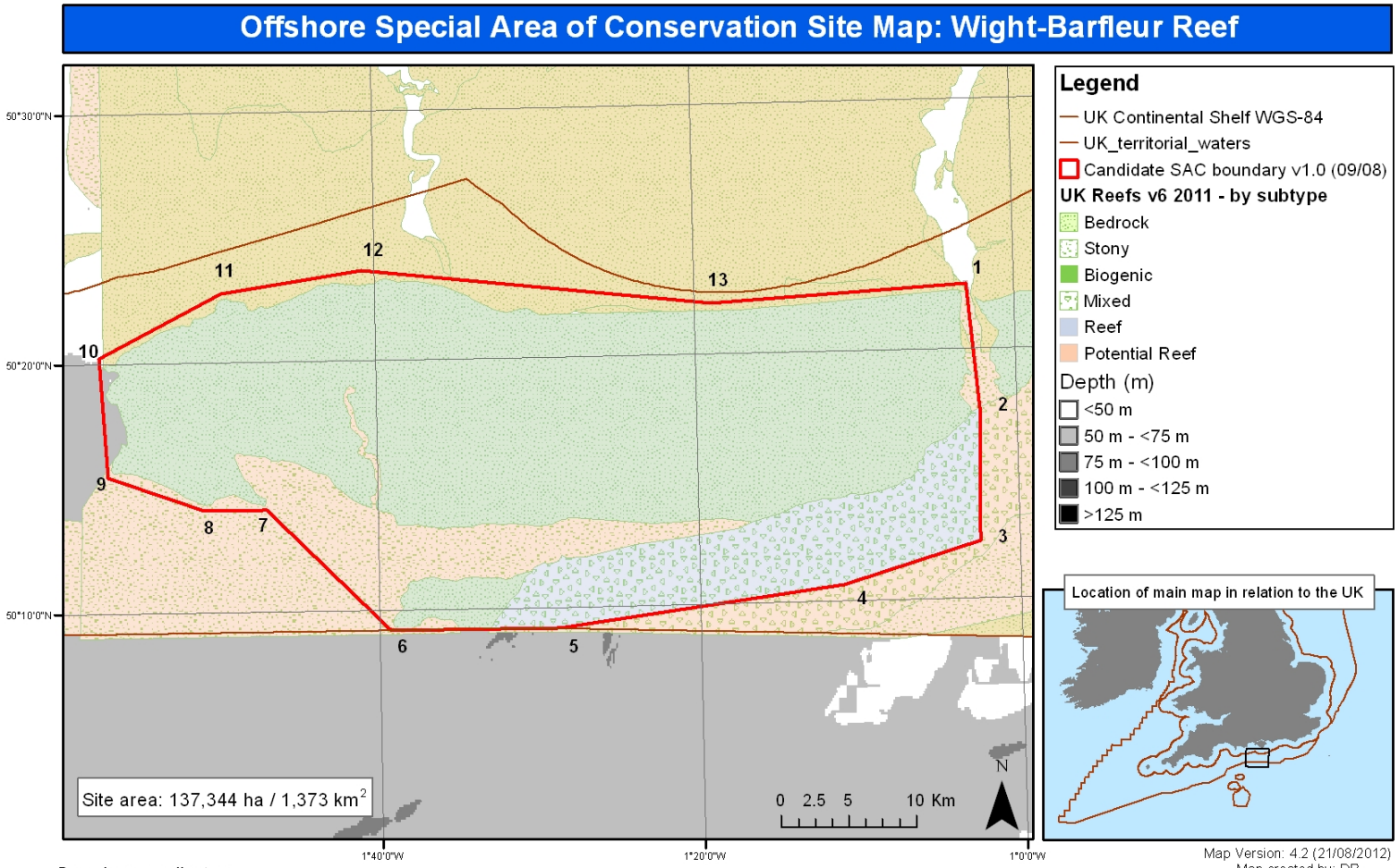
1 Site name	2 Site centre location
Wight-Barfleur Reef	50º16'40″ N, -01º28'25″ W (Datum: WGS 1984)
3 Site surface area	**4 Biogeographic region**
137,344ha/1,373km^2 (Datum: WGS 1984 UTM Zone 30 North, calculated in ArcGIS)	Atlantic

5 Interest feature(s) under the EU Habitats Directive

1170 Reefs

1351 Harbour porpoise (*Phocoena phocoena*) (non-qualifying)
1349 Bottlenose dolphin (*Tursiops truncatus*) (non-qualifying)

6 Map of site



Boundary coordinates:

1) 50º 22' 34", -01º 02' 59"; 2) 50º 17' 33", -01º 02' 18"; 3) 50º 12' 16", -01º 02' 28"; 4) 50º 10' 39", -01º 11' 00"; 5) 50º 09' 10", -01º 28' 45"; 6) 50º 09' 12", -01º 39' 17"; 7) 50º 14' 05", -01º 46' 56"; 8) 50º 14' 05", -01º 50' 50"; 9) 50º 15' 27", -01º 56' 48"; 10) 50º 20' 14", -01º 57' 17"; 11) 50º 22' 46", -01º 49' 35"; 12) 50º 23' 37", -01º 40' 47"; 13) 50º 22' 01", -01º 18' 56".

7 Site summary

Wight-Barfleur Reef is an area of bedrock and stony reef located in the central English Channel, between St Catherine's point on the Isle of Wight and Barfleur Point on the Cotentin Peninsula in northern France. The SAC is approximately 65km long (east to west) and up to 26km wide. The depth within the SAC ranges from 25m to 100m, with the deepest areas to the south, and within the palaeovalley which runs along the south-east part of the SAC.

The large area of bedrock reef within the SAC is characterised by a series of well-defined exposed bedrock ridges, up to 4m high. The rock is generally sandstone, mudstone and siltstone, although different regions within the SAC can be distinguished on the basis of the different textures formed by different types of rock. The southern area of the site is composed of flat, smooth, mudstone and sandstone, with overlying coarse sediment (gravels, cobbles and boulders) which in places forms stony reef. The south-eastern area of the site contains part of a large palaeochannel known as the Northern Palaeovalley, which forms a major channel running roughly north-east/south-west across the English Channel. In this area the palaeovalley remains largely unfilled by sediment due to the strong currents in the area, and is characterised by a gravel, cobble and boulder substrate which in places forms stony reef.

The bedrock and stony reef areas support a diverse range of reef fauna. There are many types of sponges present, from encrusting sponges to larger branching types. Tube worms, anemones and tunicates (sea squirts) are also common on the large boulders and bedrock.

This site is located within the Eastern English Channel Regional Sea (JNCC, 2004; Defra, 2004), approximately 21km south of St Catherine's point, the southern tip of the Isle of Wight. There is currently one SAC within this regional sea for which reef is a qualifying feature. This is shown below, along with the characteristic features.

SAC	**Notable characteristics of Reef interest feature (JNCC, 2007b)**
South Wight Maritime SAC	The southern shore of the Isle of Wight, off the coast of southern England, includes subtidal reefs that extend into the intertidal zone. A variety of reef types are present including bedrock composed of hard and soft rock (including chalk, limestone and sandstone), and stony reef. Reefs have high/medium topographic complexity. They occur in full salinity waters, are subject to strong coastal influence and moderate levels of energy.

An additional site, Studland to Portland, situated mainly within the Eastern English Channel Regional Sea and partly within the Western English Channel and Celtic Sea Regional Sea (JNCC, 2004; Defra, 2004) has been recommended to Defra as an SAC for Annex I bedrock, stony and biogenic reef. This is shown below, along with the characteristic features.

Possible SAC	**Notable characteristics of Reef interest feature (Natural England, 2011)**
Studland to Portland cSAC	This site lies off the south coast of Dorset and contains biologically and topographically diverse areas of reef, with multiple reef interest features. The Studland Bay to Ringstead Bay reefs exhibit a large amount of geological variety, ranging from exposed chalk bedrock, exposed shales and clays, limestone and cementstone ledges, and boulders.

	Features of particular interest within this area include a series of limestone ledges (up to 15m across) protruding from shelly gravel at Worbarrow Bay; dense brittlestar beds on shale reefs extending from Kimmeridge Bay; a unique reef feature, known as St Albans ledge, extending out over 10km offshore and subject to strong tidal action; an area of large limestone blocks known as the “seabed caves”; and biogenic reef features. The Portland Reefs are characterised by flat bedrock, limestone ledges (Portland stone), large boulders and cobbles. On the western side of Portland Bill rugged limestone boulders provide deep gullies and overhangs. *Mytilus edulis* beds are found to occur in very high densities on bedrock associated with strong currents to the southeast of Portland Bill.

Within adjacent regional seas, Lyme Bay to Torbay (within the Western English Channel Regional Sea) (JNCC, 2004; Defra, 2004) has been recommended to Government as an SAC for Annex I bedrock, stony and biogenic reef. It is shown below with its characteristic features.

Candidate SAC	**Notable characteristics of Reef interest feature (Natural England, 2010)**
Lyme Bay toTorbay cSAC	The site comprises of two main areas which are described as (from east to west) Lyme Bay Reefs and Mackerel Cove to Dartmouth Reefs. The Lyme Bay Reefs exhibit a large amount of geological variety, composed of outcropping bedrock (including igneous, chalk, mudstone, limestone, sandstone, shales, clay, slate, and cementstone), pebbles, cobbles and boulders. The reef features occur as outcropping bedrock slightly offshore and softer sediment habitats are commonly found between the bedrock or cobble/boulder areas. The reefs in the Mackerel Cove to Dartmouth area also exhibit great geological variety. Between Dartmouth and Scabbacombe Head, slate reef is present with occasional granite outcrop. The slate reefs represent complex topographic features characterised by steeply inclined bedrock rising vertically with deep gullies. Other reef features in the area include mud ledges, forming high rock ridges, and limestone ridges, boulders and pinnacles, plus biogenic reef features (in the form of *S.alveolata* beds). The complex reef features support rich species assemblages.

The Wight-Barfleur Reef is very different in character to the above sites due to its depth (circalittoral and deep circalittoral), its reduced coastal influence, and the high energy environment.

8 Site boundary

The site boundary for Wight-Barfleur Reef has been defined using JNCC's marine SAC boundary definition guidelines (JNCC, 2012). The cSAC boundary is a simple polygon enclosing the minimum area necessary to ensure protection of the Annex I habitats. The bedrock reef feature was derived from UKHO survey bathymetry, interpreted by Coggan *et al* (2009) following detailed acoustic and biological survey in the area. The boundary has been chosen to include the bedrock types in the area that include Annex I reef, based on interpretation of digital survey bathymetric acoustic data and ground-truthing with video. Stony reef has also been recorded in the south-western part of the site, but due to the inherently patchy distribution of stony reef, it is not possible to precisely delineate the extent of reef area here. The south-east section of the SAC boundary has been drawn along the southern edge of the palaeochannel, to include all recorded occurrence of reef within the channel.

As any bottom trawling that occurs in the area may pose a threat to the reef, the boundary includes a margin to allow for mobile gear on the seabed being at some distance from the location of a vessel at the sea surface. The maximum depth of water in the SAC is 100m, therefore assuming a ratio of 3:1 fishing warp length to depth, the boundary is defined to include a margin of 300 m from the reef feature. This buffer has been applied to the bedrock feature in the north of the site, and to the individual reef points in the south of the site.

It is thought that further areas of reef may be present nearby but outside of the SAC boundary. However, as no ground-truthing has been carried out to confirm the presence of reef in these areas, they have not been included within the cSAC[1].

Note that the boundary shown is for the SAC. Any future management measures which may be required under the Offshore Marine Conservation (Natural Habitats, & c.) Regulations 2007 (as amended) will be determined by Competent Authorities in consultation with JNCC, and may have different boundaries to the SAC site boundary.

9 Assessment of interest feature(s) against selection criteria

9.1 Reefs

Annex III selection criteria (Stage 1A):

a) Representativity

Wight-Barfleur Reef is located in the Eastern English Channel, and represents soft to hard bedrock reef and stony reef in the circalittoral and deep circalittoral zones. It is in full salinity waters, subject to moderate/high energy levels and an intermediate level of coastal influence. The bedrock reefs are of moderate topographic complexity, being formed into a series of ridges (Coggan *et al*, 2009). Stony reefs formed by cobbles and boulders are also present. The faunal communities present on the bedrock and stony reef are characteristic of high and moderate energy circalittoral rock. The extensive bedrock reef is an excellent example of circalittoral bedrock reef, and the only known such example in offshore waters within this regional sea.

The grade for this feature is A (excellent representativity).

[1] Further surveys have now been instigated by JNCC during 2011/2012 within the nearby area but are still presently being analysed.

b) Area of habitat

The reef feature is 119,699 ha (1196 km^2) in area (flat mapped extent). This has been calculated by adding the extent of bedrock reef (determined by the interpreted digital survey bathymetry data in Coggan *et al*, 2009) and the extent of stony reef, which due to being a mosaic habitat has been approximated from the potential distribution of stony reef within the site according to Graham *et al* (2001).

An estimate of the entire Annex I reef resource (bedrock, cobble and biogenic reef) in UK waters is 7,180,000 hectares. This total extent figure gives the following thresholds for the grades of this criterion (CEC, 1995):

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

This site's feature therefore falls within the '0-2%' bracket for Area of Habitat and is graded C.

c) Conservation of structure and functions

Degree of conservation of structure

Available evidence indicates that there were a small number of exploratory drilling sites in this area in the late 1970s/early 1980s, which may have resulted in localised impacts such as smothering. However, due to the length of time since activity ceased (>20 years), it is highly likely that at least partial recovery from any impacts will have occurred subsequently (Mair *et al,* 2003). In terms of current activities, there is a cable running across the length of the site, and numerous wrecks throughout the site. Levels of demersal fishing in the area are thought to be low (Eastwood *et al*, 2007; Coggan *et al*, 2009).

The grading for this sub-criterion is therefore II: structure well conserved.

Degree of conservation of functions

The prospects of this feature to maintain its structure in the future, taking into account unfavourable influences and reasonable conservation effort, are good. A mechanism is available through the European Commission's Common Fisheries Policy regulations to modify fishing activity in the area if this is deemed to be necessary. In addition, regulations are in place to regulate oil and gas activity in and around SACs in the UK Continental Shelf Designated Area, should hydrocarbon exploration/exploitation occur in this area. The laying of submarine cables and pipelines also requires regulatory consent. The reef is distant from terrestrial sources of pollution. The grading is I: excellent prospects.

Restoration possibilities

Restoration of the biological communities on the Wight-Barfleur reef would be possible accepting that restoration methods in the offshore area focus on the removal of impacts which should allow recovery where the habitat has not been removed. It is likely that a similar community to that present now would develop if activities causing damage were removed. The grade is II: restoration possible with average effort.

Overall grade

Due to the first sub-criterion of this criterion being graded II: structure well conserved, and the second sub-criterion being I: excellent prospects, the overall grading is A: excellent conservation, regardless of the third sub-criterion.

d) Global assessment

The suggested grades for Stage 1A criteria a)-c) are A, C and A respectively. Given these evaluations and taking into account the lack of known impacts or damage to the habitat, the Global Assessment grade is A ('excellent conservation value').

Summary of scores for Stage 1a criteria

Area of habitat	Representativity (a)	Relative surface (b)	Structure and function (c)	Global assessment (d)
Wight-Barfleur Reef	A	C	A	A

9.2 Harbour porpoise (*Phocoena phocoena*)

Size and density of the population of the species present on the site (a)

Harbour porpoise (*Phocoena phocoena*) are found throughout the majority of UK continental shelf waters. Between SCANS I and SCANS II (SCANS II, 2008) there was an increase in harbour porpoises present in the southern North Sea which was also evidence in local sightings and strandings data. The species is still very rare in the English Channel, and represents one of the areas with the lowest occurrence of the species (Reid *et al*, 2003). Although small numbers of *Phocoena phocoena* have been sighted in the English Channel, no sightings have been recorded within the boundary of the cSAC (Evans *et al*, 2003; Reid *et al* 2003). However, due to the highly mobile nature of the species and the large size of the cSAC, it is likely that harbour porpoise may sometimes occur within the boundaries and are therefore considered to be grade D, i.e. a non significant presence. As such, no other indication is required for the additional evaluation criteria concerning this species within the site.

9.3 Bottlenose dolphin (*Tursiops truncatus*)

Size and density of the population of the species present on the site (a)

This species is found in many parts of UK waters, on the continental shelf and further offshore (Evans *et al*, 2003; Reid *et al*, 2003). Although there are few reports of the species from within the cSAC boundary, small groups appear to be resident or near-resident in waters off Cornwall and Dorset which range further east along the south coast (Williams *et al*, 1996; Wood, 1998; Evans *et al,* 2003; Reid *et al*, 2003). Therefore *Tursiops truncatus* is considered to be grade D, i.e. a non significant presence. As such, no other indication is required for the additional evaluation criteria concerning this species within the site.

10 Sites to which this site is related

None.

11 Supporting scientific documentation

The information to support this SAC designation comes from two main sources. Firstly, UKHO Digital Survey Bathymetry data was available for an extensive part of the central English Channel. This data clearly shows bedform features, and has been used, in combination with rock samples and seismic data, to delineate areas of different rock type (Collier *et al*, 2006 cited in Coggan *et al*, 2009). The second source of information is a Defra funded project, "Broadscale mapping of hard substrates in the central English Channel," led by CEFAS, with JNCC as project partners. This project included two multidisciplinary surveys of the central English Channel, conducted in summer 2006, both on the R/V Cefas Endeavour. During these two surveys, multibeam and sidescan data was acquired along a series of corridors (spaced 4-5 km apart) to gain a broad overview of the area, and a more detailed survey (100% sidescan and/or 100% multibeam coverage) was carried out over four discrete areas, targeting specific features of interest. Biological data, in the form of video tows, grab samples and beam trawls were also obtained to target specific features of interest. These data were analysed, and integrated, to provide an overview of the area of study, and the biological communities present within (Coggan *et al*, 2009). Data from this project are presented in Figure 1.

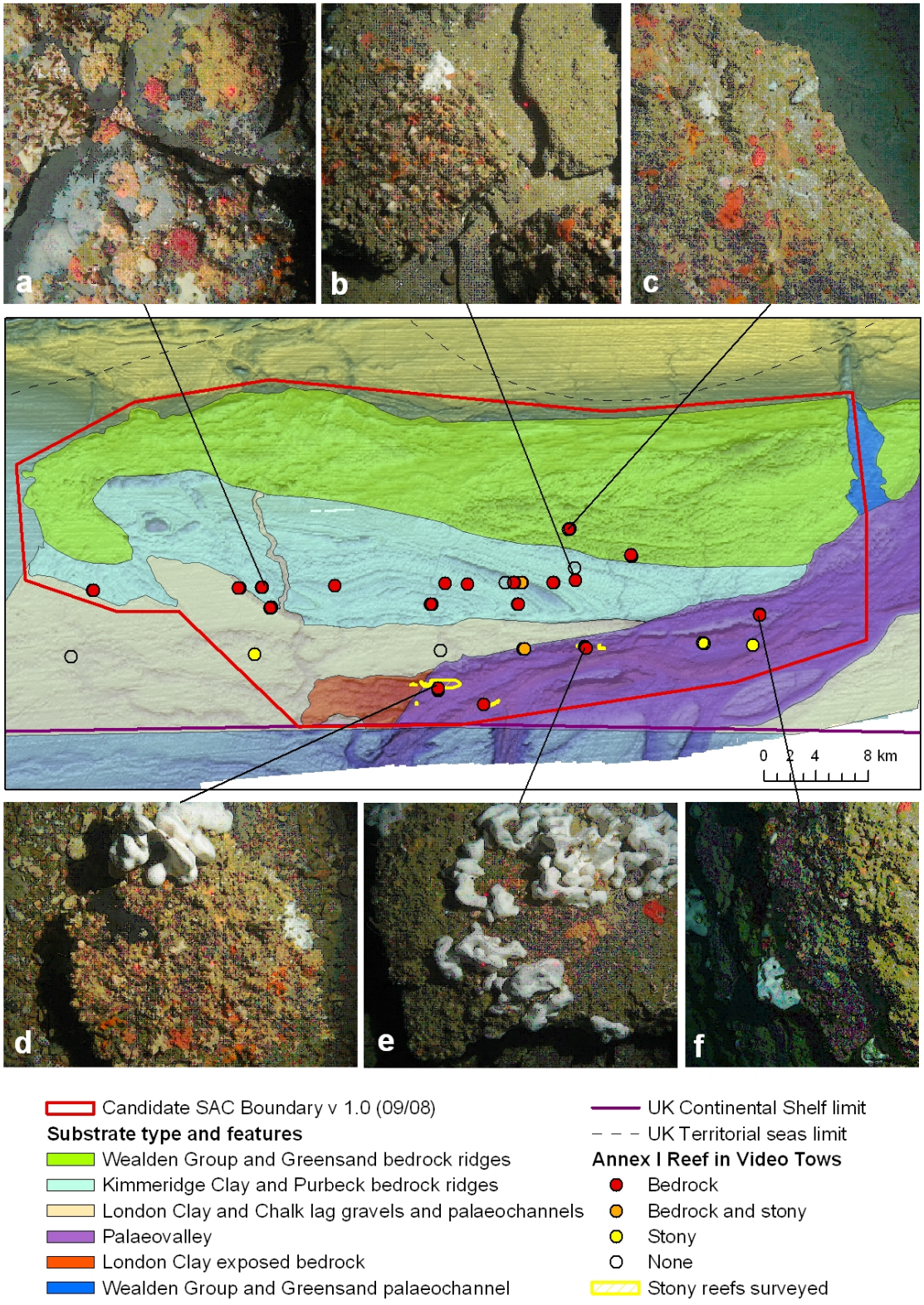


Figure 1. Map showing location of different rock types within SAC boundary, and observed records of Annex I reef and example images from video tows conducted within each area (Underlying bathymetry © British Crown and UKHO. All rights reserved. Photos © Crown Copyright)

12 Site overview and conservation interest

The area encompassed by the cSAC boundary can be sub-divided into five distinct regions, each of which differs in terms of the geological and biological characteristics (shown by different coloured areas in Figure 1). Due to the thin seabed sediments in this part of the English Channel (<0.5m thick) the nature of the bedrock in different locations can be clearly distinguished from textural characteristics visible from the bathymetry alone, an assumption that is supported by seabed samples taken throughout the area (Coggan *et al*, 2009). Throughout the area the biological communities are influenced by the strong tidal currents that operate in this part of the English Channel.

Wealden Clay and Greensands bedrock ridges

To the north of the site (green area in Figure 1) is a large area of Wealden Clay, a soft rock that is easily broken upon impact. The rock forms a series of irregular ridges, becoming increasingly amalgamated in the west of the region. Underwater video footage here showed that the rock ridges supported two different reef communities. The first biological community was composed of the hornwrack *Flustra foliacea*, a variety of sponges of different forms (cushion, encrusting, arborescent, cup-like), the tube-worm *Bispira* sp., and a range of hydroids (biotope CR.HCR.XFa.FluCoAs; Figure 1, photo c). The second reef community included abundant sponges of a range of forms (massive, cushion, encrusting, arborescent), anemones, and a luxuriant growth of hornwrack and hydroids (biotope CR.HCR.DpSp).

Between the ridges, soft rock is scoured by mobile sediments, preventing epifauna from growing. Although only a limited number of videos were obtained within this part of the SAC, previous research by Holme and Wilson (1985), carried out in the western tip of this area, showed similar biological assemblages on cobbles, boulders and rock outcrops.

Kimmeridge Clay and Purbeck bedrock ridges

In the centre of the site (light blue area in Figure 1) the rock is primarily Kimmeridge Clay, which is a harder rock than Wealden Clay and less easily broken. This forms a series of regular ridges, approximately 2-4m high, which can be seen clearly on high resolution multibeam (Figure 2). The rock ridges are silted in places, and in some places the rock is smooth and flat, but generally the tops and slopes of the ridges support a range of reef communities, whilst the troughs are characterised by coarse sediment communities (pebbles, cobbles and gravels). The reef communities present are predominantly characterised by tide-swept moderately wave-exposed circalittoral rock with a variety of ascidians (e.g. *Botryllus* sp.), encrusting sponges, and hornwrack (biotope CR.HCR.XFa.FluCoAs, Plate 1; Figure 1 photos a and b). Other reef communities present include a mixed encrusting community of sponges, hydroids and bryozoans (biotope CR.HCR.XFa.ByErSp, Plate 2), and a heavily sand-scoured community dominated by hornwrack and a hydroid/bryozoan crust (biotope CR.MCR.EcCr.FaAlCr.Flu). Both of these communities occur on smooth, flat inclined bedrock slopes. On steep rock faces, the community comprises dense patches of the hydroid *Tubularia* sp. and the anemone *Actinothoe* sp. on more exposed rock faces (biotope CR.HCR.FaT.CTub.CuSp, Plate 3), with a range of sponges, tunicates and tube worms (*Bispira* sp.) in more sheltered areas. Within this area, extensive brittlestar beds formed by the species *Ophiocomina nigra* and *Ophiothrix fragilis* have been observed on some areas of flat bedrock (Plate 4).

Running through the area of Kimmeridge Clay is a small palaeochannel, which in places is underlain by bedrock, but in other places characterised by a cover of stable cobbles, forming Annex I stony reef, and supporting a range of epifauna, such as sponges, bryozoans and hydroids.

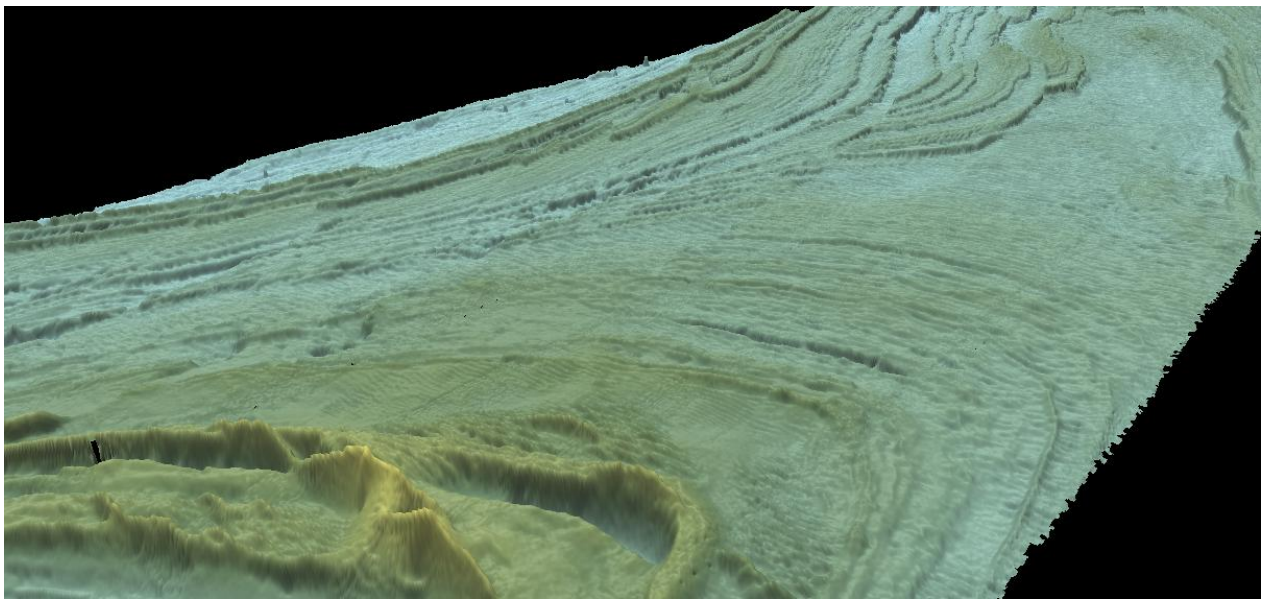


Figure 2. 3D display of survey multibeam bathymetry, showing bedrock ridges (vertical exaggeration x 12).

London Clay and Chalk with stony reef

The seabed in the south of the SAC is composed of the moderately hard London Clay, and Chalk, which forms a fairly featureless surface (pale beige area in Figure 1). From the two video tows undertaken within the site boundary on this area of London Clay and Chalk, one recorded evidence of Annex I stony reef. In addition, videos taken to the east and west of the SAC over areas with the same underlying geology and lag gravel on top have recorded Annex I stony reef (Coggan *et al*, 2009; James *et al*, 2007). In these locations, the cobbles and gravel have appeared to be sufficiently stable to support a range of epifauna such as erect bryozoans (e.g. Ross coral, *Pentapora foliacea*), sponges and hydroids. In light of the evidence showing the occurrence of patchy Annex I stony reef, this area has been classified as *potential* stony reef (see site map in Section 6).

Northern Palaeovalley

In the south-east of the SAC is a section of the 'Northern Palaeovalley,' which is part of a large channel system that runs through the English Channel (purple area in Figure 1). In some parts of the Channel, palaeovalleys have been subsequently in-filled by modern sediments, but here within the site boundary, there is evidence demonstrating that the palaeovalley remains largely unfilled, and has a number of different rock types exposed at the seabed surface. The biological communities present within the palaeovalley appear to relate to depth and topography rather than the underlying rock type. Although ground-truthing was limited to the southern part of the palaeovalley, it is anticipated that a similar distribution of habitats would be found further north, due to the similarities visible in the seabed texture that can be seen on the UKHO survey bathymetry.

On the palaeovalley floor, numerous areas of consolidated 'cobble pavement' and cobbles held in place by accretions of encrusting life-forms were recorded, notably with a high proportion of cushion sponges. These areas were consistent with Annex I stony reef (Coggan *et al*, 2009). These areas of consolidated cobble pavement support a biological community that contains ross coral (*Pentapora foliacea*), hydroids, anemones (e.g. *Corynactis* sp.) and tube worms (similar to biotope CR.HCR.DpSp, Plate 5). Where the consolidated cobbles overly rock, the biological community is more similar to bedrock reef present in other parts of the site (biotope CR.HCR.XFa.FluCoAs).

Boulder fields are found on both the valley floor and on ledges on the valley sides, and are characterised by large boulders on bedrock, forming a mixture of Annex I reef types (stony

and bedrock). Several biological communities are present characterised by containing a range of different sponges (communities most similar to CR.HCR.XFa.ByErSp, CR.HCR.DpSp, CR.HCR.FaT.BalTub and CR.HCR.XFa.FluCoAs) (Plate 6; Figure 1 photo d). In between boulders, coarse gravel with little epifauna is present.

The sides of the palaeovalley are in places formed by steep bedrock and boulder faces, which again support a range of sponge communities (biotopes CR.HCR.XFa.ByErSp and CR.HCR.DpSp, Plate 7 and Figure 1 photos e and f).

London Clay exposed bedrock rock

While the final region within the SAC boundary (red area in Figure 1) has not been ground-truthed by biological survey, data from the acoustic survey (multibeam backscatter and sidescan sonar) and Digital Survey Bathymetry indicate that outcropping rock is exposed at the seabed surface, with the resultant seabed habitats consistent with Annex I bedrock reef. While the rock types are mainly mudstone and sandstone, the steeper incline and greater rugosity of the seabed indicate that exposed rock rather than lag gravel is prominent at the seabed. It should be noted that the nearest camera tow to this area recorded Annex I reef (just over one kilometre to the east) and was in an area exhibiting similar acoustic returns as this area.

Plate 1[2]. Smooth Kimmeridge Clay bedrock, covered with a dense mat of the ascidian *Dendrodoa grossularia*, the hydroid *Tubularia* sp. and other encrusting sponges and ascidians. (Biotope is *Flustra foliacea* and colonial ascidians on tide-swept moderately wave-exposed circalittoral rock, CR.HCR.XFa.FluCoAs).

Plate 2. Clay bedrock with boulders that are covered with the anemone *Actinothoe* sp., yellow encrusting and arborescent sponges, the soft coral *Alcyonium digitatum* and a hydroid turf. Also visible in the photo are three common starfish, *Asterias rubens*. (Biotope is Bryozoan turf and erect sponges on tide-swept circalittoral rock, CR.HCR.XFa.ByErSp).

[2] All photos except Plate 5 were taken during the Defra funded project, "Broadscale mapping of hard substrates in the central English Channel" © Crown Copyright (Coggan *et* a,l 2009). Plate 5 was taken during surveys for "The Eastern English Channel Marine Habitat Map" project, funded by the the Marine Environment Protection Fund (MEPF) which is a component of the Aggregate Levy Sustainability Fund (ALSF) administered by Defra. © Joint copyright BGS, CEFAS, JNCC & MES (James *et al*, 2007).

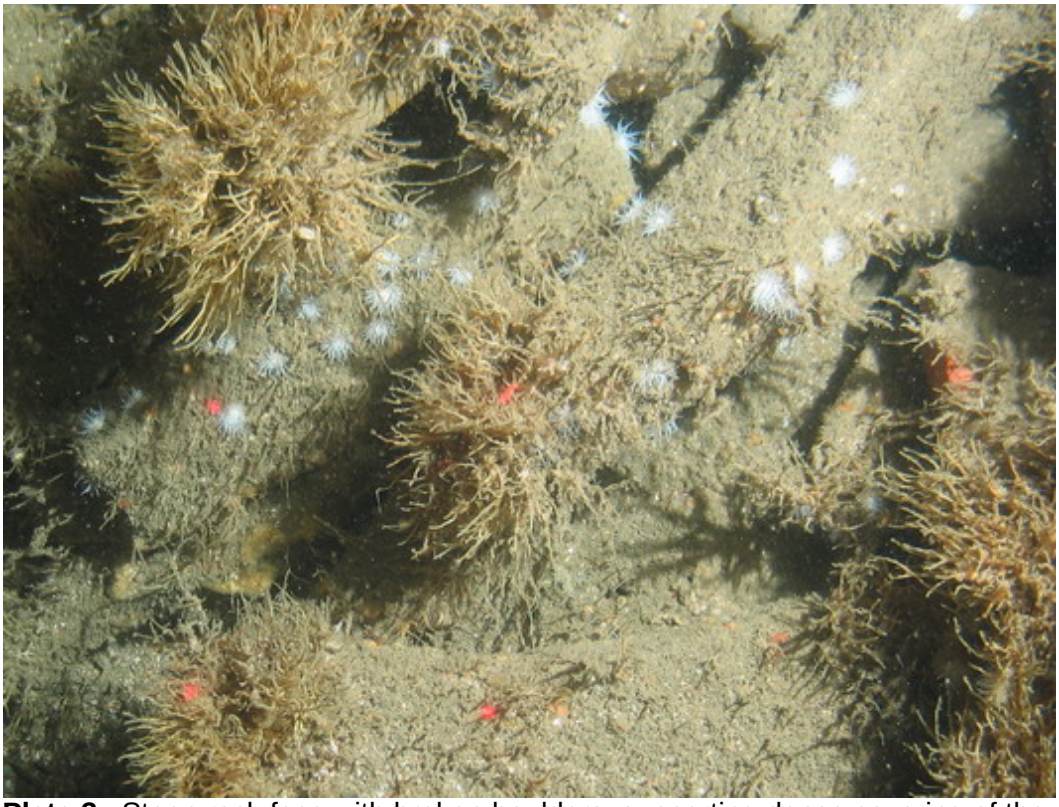


Plate 3. Steep rock face with broken boulders, supporting dense covering of the hydroid *Tubularia* sp., the anemone *Actinothoe* sp., and encrusting sponges. (Biotope is *Tubularia indivisa* and cushion sponges on tide-swept turbid circalittoral bedrock, CR.HCR.FaT.CTub.CuSp).

Plate 4. Flat, smooth, silted bedrock, with dense bed of brittle stars (predominantly *Ophiothrix fragilis*). Also visible is the anemone *Urticina* sp. and the soft coral *Alcyonium digitatum*. (Biotope is Brittlestar bed on faunal and algal encrusted, exposed to moderately wave-exposed circalittoral rock, CR.MCR.EcCr.FaAlCr.Bri).

Plate 5. Stable, consolidated cobble pavement, encrusted with sponges, and also supporting the anemones *Corynactis* sp. and *Sagartia troglodytes* and ross coral, *Pentapora foliacea*. (Biotope is closest to Deep sponge communities, CR.HCR.DpSp).

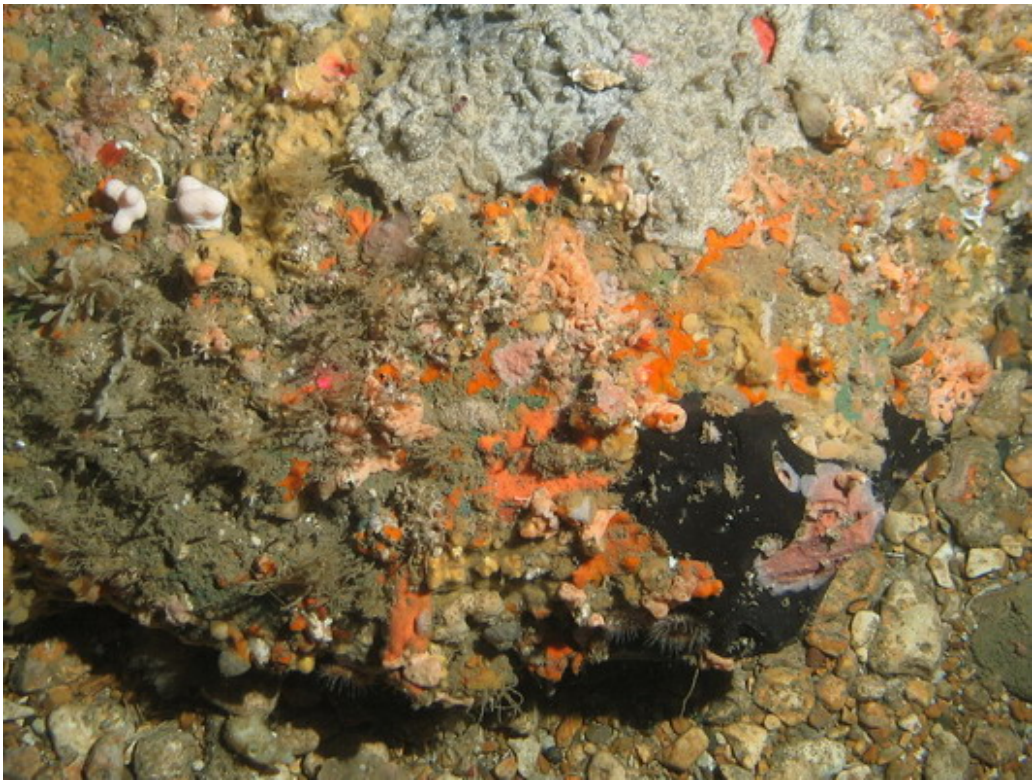


Plate 6. Boulders on bedrock, interspersed with coarse gravel and cobbles. Boulders encrusted with range of sponges, hydroids, anemones, the soft coral *Alcyonium digitatum*, ascidians (including *Dendrodoa grossularia*) and the bryozoan *Flustra foliacea*. (Biotope is closest to Deep sponge communities, CR.HCR.DpSp).

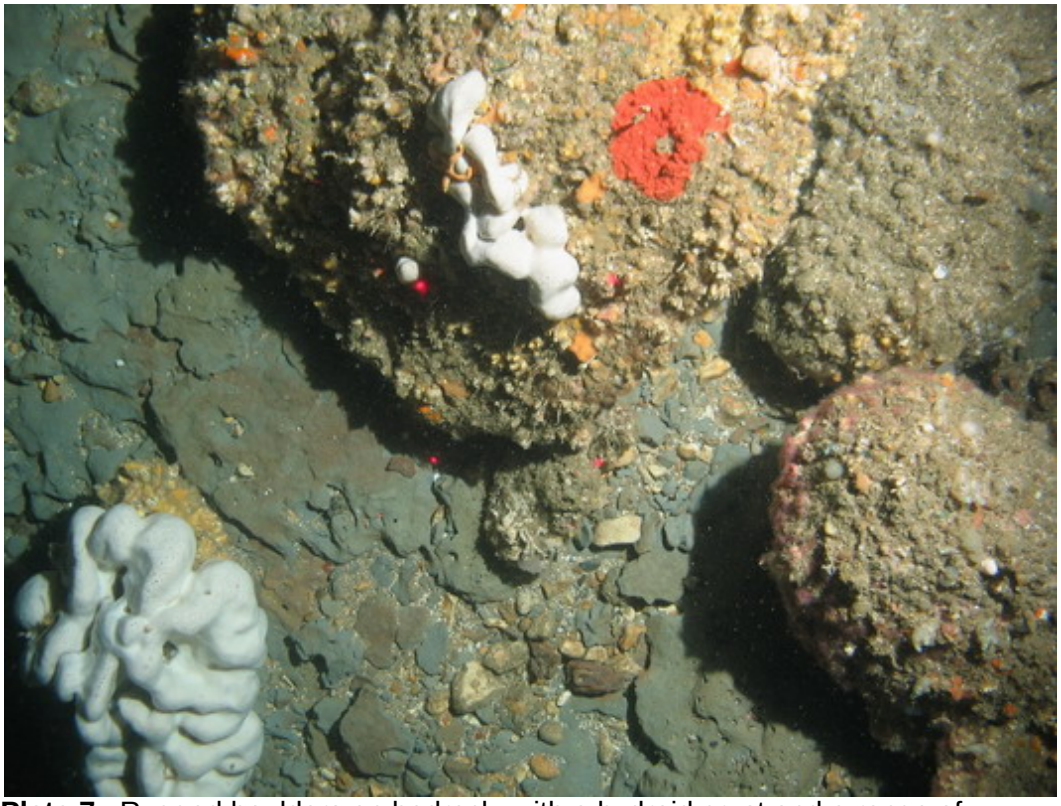


Plate 7. Rugged boulders on bedrock, with a hydroid crust and a range of encrusting and massive sponges, including the white sponge *Pachymatisma johnstonia*. (Biotope is Bryozoan turf and erect sponges on tide-swept circalittoral rock, CR.HCR.XFa.ByErSp).

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