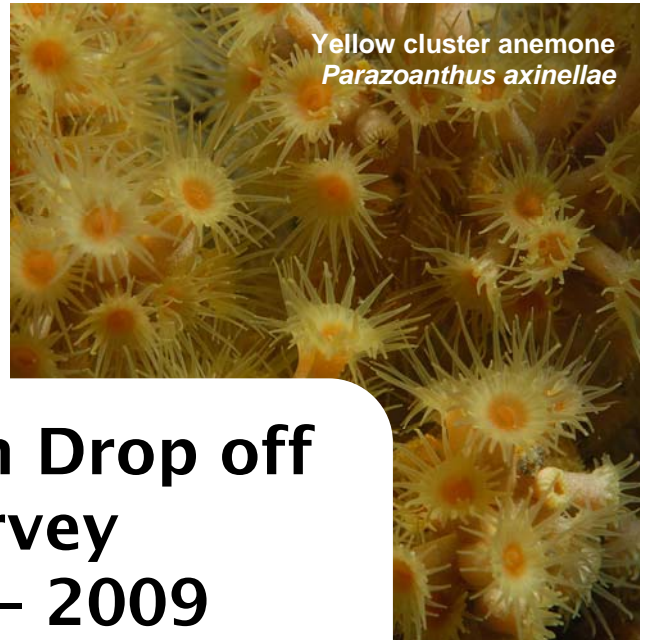


Drop Off reef scene



Yellow cluster anemone
Parazoanthus axinellae

Plymouth Drop off Survey 2006 - 2009 Report



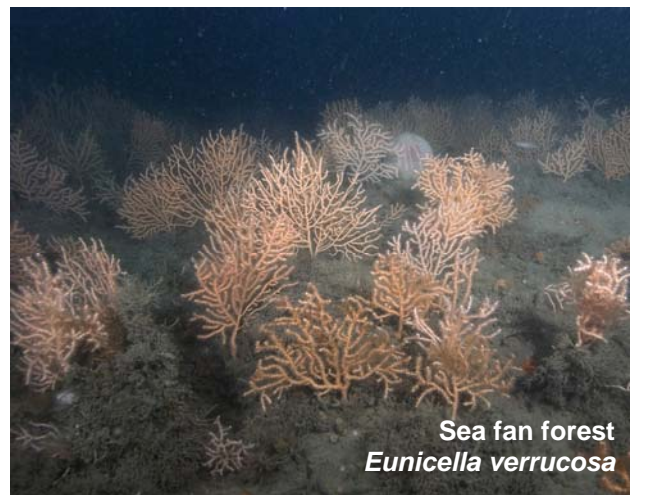
Potato crisp bryozoan
Pentapora foliacea



Sunset cup coral
Leptopsammia pruvoti



Sea fan nudibranch
Tritonia nilsodnheri



Sea fan forest
Eunicella verrucosa



PLYMOUTH DROP OFF

SEASEARCH SURVEYS 2006 - 2009

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1 Introduction

1.1 Background to the general area

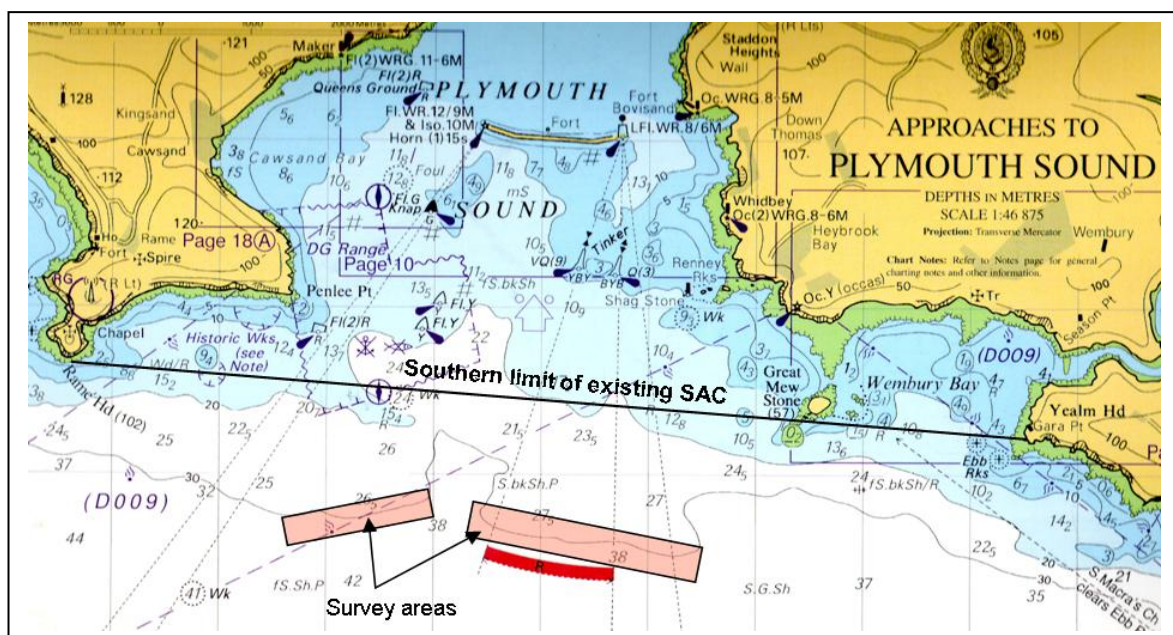
Plymouth Sound Special Area of Conservation (SAC) was designated in 2005 and covers the area to the north of a line from Garra Point on the east side of the Yealm estuary in Devon to Rame Head in Cornwall. The area is the largest estuarine system in southwest England and supports several important different habitats. The SAC is also home to the marine Biodiversity Action Plan (BAP) species the fan mussel *Atrina pectinata* and the pink sea fan *Eunicella verrucosa*, together with several nationally rare marine species. The BAP species the short snouted seahorse *Hippocampus hippocampus* has also been recorded here.

Well offshore to the south and southwest of the Plymouth Sound SAC are well known and well documented reefs – Eddystone Reef, Hand Deeps and Hatt Rock (Seasearch Plymouth Reefs 2005 Report). To the east of Plymouth Sound, Bigbury Bay also contains many well-documented reef and wreck areas (Seasearch South Devon Reefs Survey July 2003 Report). These reports consider dive surveys to depths usually dived by sports divers i.e. down to 30m below sea level. Depths below this are less regularly dived by volunteers.

1.2 The survey area

Outside the limits of the current SAC, approximately 4 km directly south of the Plymouth breakwater, there is an area less well documented than the SAC and inshore areas due, in part, to the greater depth there.

A generally level rocky plateau at between 26 metres and 28 metres below chart datum (bcd) drops away sharply on the southern side to 38 metres bcd and deeper. The steep and often ragged edge of the plateau – which would appear to be a past cliff line when sea levels were considerably lower – runs approximately east-west fairly continuously across the centre of the entrance to Plymouth Sound for about 5km. There are many indentations forming steep sided gullies with shaded overhangs. At the base of the drop-off there is fine sediment interspersed with large, stable boulders and bedrock outcrops. The whole area is generally known as the Plymouth Drop Off although certain specific well dived GPS positions have been given individual site names.



It was known that three BAP species, (sunset cup coral *Leptopsammia pruvoti*, pink sea fan *Eunicella verrucosa* and sea fan anemone *Amphianthus dohrnii*) were to be found here and there were recent reliable reports of their presence from local divers. In the summer and autumn of 2006 five sites were dived and surveyed by teams of Seasearch divers. In 2007 a further two sites were surveyed, in 2008 just one and in 2009 a special project of evening dives with divers experienced in both Seasearch and this depth of dive surveyed a further nine sites in two distinct survey areas. This report summarises the findings of these Seasearch dives together with reliable information and sightings gleaned from other independent divers.

The chart on page 6 shows the two survey areas in context to Plymouth Sound and the existing SAC. Both areas cover sections of the 30m bcd contour line. The contour deviates to the north between the two areas and appears to be the old river bed when sea level was considerably lower. In the survey areas the sea bed drops in most places fairly steeply southwards from c. 26/27m bcd to 38m bcd. To the east and west extremities of the survey areas and in the centre, between the survey areas, the drop is less defined and slopes more gently to deeper water and does not provide the suitable overhanging or shaded habitat for *Leptopsammia pruvoti*.

Natural England has recently notified a consultation on a new draft SAC and the eastern survey block falls within the proposed new inshore Prawle Point to Plymouth Sound and Eddystone SAC. For further information on this see

<http://www.naturalengland.org.uk/ourwork/marine/sacconsultation>

The boundary of the proposed SAC becomes very relevant when one looks at the distribution of *Leptopsammia pruvoti* records discussed later in this report in section 5 and illustrated graphically in the map in Appendix 1.

2 Marine Biology

The general habitat and species were recorded on the dives but special emphasis was placed on the three BAP species below. Latin names have been used throughout this report for exactness, any common names used are as those listed in 'Seasearch Observer's Guide to Marine Life of Britain and Ireland'.

2.1 Pink sea fan, *Eunicella verrucosa*

The pink sea fan, *Eunicella verrucosa*, is a slow growing species of horny coral, or gorgonian, which is a prominent part of the south-western marine fauna. Devon and Cornwall is the centre of its distribution within the British Isles though there are smaller populations in South Wales and Dorset. Studies have shown that the rate of growth of mature colonies is between 1cm and 2cm per annum although small recruits are now known to grow faster. Since colonies frequently reach a width/height of 50cm this suggests an age of 25-30 years, which in terms of marine life is a relatively long lifespan. The sea fans are large and relatively brittle and thus could be easily damaged by human interference. They are one of the very few marine species protected from damage by the Wildlife and Countryside Act 1981.



Pink sea fan forest on the plateau top.

2.2 Sunset Cup Coral, *Leptopsammia pruvoti*

The sunset cup coral, *Leptopsammia pruvoti* is recorded at just a few sites from the Isles



Leptopsammia pruvoti colony on the drop-off.

of Scilly, Lundy, south Devon, Lyme Bay and the Channel Islands. On the south Devon coast it has been found only at the Plymouth Drop Off sites. The largest and most striking of all the solitary cup corals and one of the rarest, it grows to 2cm across and is an intense golden yellow or orange colour. It lives well below the low water line down to around 40m and, although it is a solitary coral, is often found in groups of between ten and several hundred individuals. It is a slow-growing coral which can live to be over 100 years old but reproduces

very infrequently making it vulnerable to disturbance. It also appears to be very particular about the exact habitat and conditions for successful colonisation. It may be that our populations are remnants from larger past populations when conditions were different.

2.3 Sea fan anemone, *Amphianthus dohrnii*

The sea fan anemone lives almost exclusively on the sea fan, only very occasionally being found on erect hydroids. This is a small anemone rarely exceeding 10mm across the disk. The base wraps around the sea fan, eventually killing the coral polyps where it is situated. It normally reproduces by basal laceration so there are often several anemones together on one fan. It appears to gain a feeding advantage by being raised into the current on it's host sea fan. Although understood to be common in the English Channel in the 1920s and 1930s, it is now rare.



Amphianthus dohrnii colony

3 Methods

3.1 Participants

All participants in the survey were diving as volunteers and included marine biologists, Seasearch tutors, Seasearch Surveyors, Surveyors under training and Seasearch Observers. Surveys were carried out using the Seasearch survey form techniques aided by digital photography to gauge densities and verify species identity. Information from other experienced divers has also been forthcoming over the period and has been included where appropriate and where known to be reliable.

3.2 Organisation of the dives

All the Seasearch dives were undertaken from RIBs and for each dive a single shot was deployed at a specific GPS position and buddy pairs given a direction to search from the

bottom of the shot subject to current and bottom conditions. Standard safety procedures were followed and divers carried delayed surface marker buoys and dive computers. Gas mix was decided by individual divers and was within their training regimes.

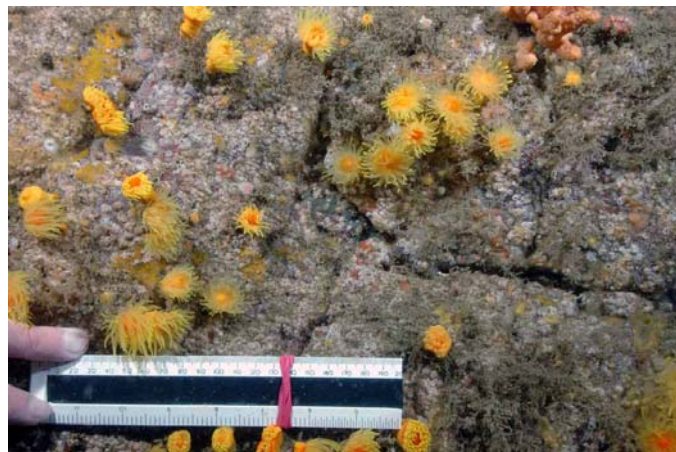
Divers were to look for and record

- sunset cup corals *Leptopsammia pruvoti* together with densities and young ones
- pink sea fans *Eunicella verrucosa* with some being individually measured
- sea fan anemones *Amphianthus dohrnii*
- sea fan nudibranchs *Tritonia nilsodhneri*
- other marine life, especially unusual species, sponges, other corals, anemones and sea squirts
- general habitat with the purpose of ascertaining biotopes
- any damage/litter/man-made debris

3.3 Data recording, analyses and quality control

Following each dive usually a single Seasearch survey form was completed with the information gathered from the whole group. Occasionally additional forms were completed where divers had surveyed dissimilar areas. Abundances were estimated and recorded using the SACFOR system (see Connor & Hiscock, 1996).

Mixed teams of Seasearch tutors, marine biologists and trained surveyors provided a reasonable level of accuracy for both habitat descriptions and species identification. No specimens were collected and all fauna was identified in situ or with the help of digital photographs, identification guides, Internet guides and reference to species specialists. Densities and measurements were estimated underwater and confirmed with photographs. Biotopes were allocated by those with appropriate expertise.



Measuring densities at Sunset site.
Photo Dr Keith Hiscock.

3.4 Data entry

The Seasearch data will be (or for previous years already has been) entered into Marine Recorder and the original raw data sheets retained by the Devon Wildlife Trust in their Biodiversity Office at Exeter.

4 Results

4.1 General remarks

It should be noted that deploying a shot and line on an exact GPS position into 30+ metres of water may give a certain error factor. As many of the sites are close together it is inevitable that some of the information overlaps and some species recorded at one GPS position are the same as those recorded at a nearby GPS position depending on the lie of the shot line, currents, underwater visibility and direction and distance of swim of the divers. The shot was usually deployed at the shallowest region of the site, divers then heading a few metres south from the bottom of the shot line to the deeper drop.

4.2 Overall habitat descriptions

The dives were all on similar sites geologically and thus for most the habitats were remarkably alike and separated conveniently into four distinct zones and three distinct habitats/biotopes. The area was judged to be exposed with maximum tidal streams of 1 knot. Dives were carried out at slack water. It would be repetitive to give a full description of each habitat on each site, the general area has therefore been summarised and individual sites listed afterwards with appropriate notes on each.

Habitat 1 - Top of reef c. 27 to 30m below chart datum

The top of the reef is a circalittoral upward facing bedrock sandstone plateau, often with uneven 0.5 – 1 metre deep hollows and some deeper gullies. The bedrock has a fine covering of silt with deeper silt in the hollows and bottoms of the gullies. Towards the south the gullies lead to the edge of a cliff-like drop.



Pink sea fan forest on the reef top

Fauna recorded included a generally abundant sea fan forest *Eunicella verrucosa* on the bedrock with often 8-10 fans per square metre and many large fans i.e. >30x30cm. The understory included sparse sponges the commonest of which were yellow staghorn sponge *Axinella dissimilis* and boring sponge *Cliona celata*. Hydroids in season included the antenna

hydroid *Nemertesia antennina*. The Devonshire cup coral *Caryophyllia smithii* and large specimens of the potato crisp bryozoan *Pentapora foliacea* were also frequently recorded.

BAP habitat - Fragile sponge and anthozoan turf
Biotope code CR.HCR.XFa.ByErSp.Eun

Habitat 2 - Sloping or vertical reef wall c. 28m to 38m below chart datum

At the southern edge of the plateau there is a variable south facing drop, in places sloping but generally near vertical. It is covered with a dense faunal turf of barnacles *Verruca stroemia*, sparse sponges including the mashed potato sponge *Thymosia guernii* and the crumpled yellow sponge *Axinella damicornis*, often abundant red fingers *Alcyonium glomeratum*, dead men's fingers *Alcyonium digitatum*, yellow cluster anemones *Parazoanthus axinellae* together with white cluster anemones *Parazoanthus anguicomis*, cup corals including *Caryophyllia smithii* recorded generally as common, encrusting bryozoans and (usually towards the base of the drop) the football sea squirt *Diazona violacea*.

Biotope code CR.HCR.XFa.SpAnVt



Mixed fauna on the vertical reef drop

Habitat 3 - Overhanging and shaded areas usually c. 34 – 38m below chart datum

The bedrock reef face is on occasions overhanging forming 'shaded' areas. It is also



Section of the drop-off overhang showing large mature *Leptopsammia pruvoti* together with smaller individuals, *Alcyonium glomeratum* and *Eunicella verrucosa*.

indented with steep sided gullies or canyons, some very narrow. In these less exposed and darker areas the cup corals *Leptopsammia pruvoti*, Weymouth carpet coral *Hoplangia durotrix*, Southern cup coral *Caryophyllia inornata*, and the pink soft coral *Alcyonium hibernicum* have all been recorded. Sponges *Thymosia guernii* and *Axinella damicornis*, cnidarians *Alcyonium glomeratum* and *Parazoanthus* spp and the ascidian *Diazona violacea* are regularly recorded here.

Biotope code
CR.FCR.Cv.SpCup

Habitat 4 - Boulder and bedrock area c. 36m+ below chart datum

To the south and at the bottom of the drop and gullies is an area usually of stable large boulders and bedrock outcrops interspersed with fine silt. The boulders have a less

prolific fauna than the previous habitats but still with *Eunicella verrucosa*, some hydroids, echinoderms, especially the spiny starfish *Marthasterias glacialis* and cotton spinner *Holothuria forskali* and encrusting bryozoans. There are often more fish recorded in this habitat. Sponges are uncommon here but *Eunicella verrucosa* is generally frequent or common, not usually in the abundances seen in habitat 1.



Boulder field at bottom of drop off.

There would appear to be no exact biotope code match, the following being the nearest despite the paucity of sponges.

Biotope code CR.HCR.XFa.ByErSp.Eun

4.3 Individual sites

A brief summary of each of the sites surveyed by Seasearch, together with plan or map of the dive site where appropriate is included in this section, arranged from east to west. These descriptions are edited from the relevant Seasearch Survey form summary.

GPS positions and brief details of extra sites and any *Leptopsammia pruvoti* sightings (no other species) have also been included in this section where records covering a period from 2001 to 2009 have been obtained from Dr Keith Hiscock - indicated by the initials KH and followed by his log book notes.

Some of the more regularly dived sites have over time been given individual site names which have been included. Other sites are generally just known as 'Drop Off' and are differentiated by their GPS positions. As will be apparent from the positions and notes, some sites are very close together and on occasions overlap but overall the area has been fairly comprehensively surveyed.

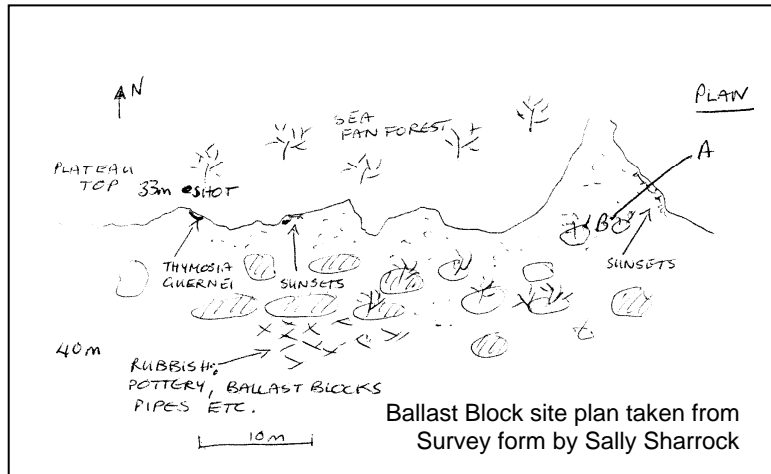
50° 17.552N, 004° 07.810W Shell site, Seasearch 23/07/2007

The site comprised a fairly level bedrock reef top c 29m bcd, very silty, with sea fan forest (*Eunicella verrucosa* recorded as superabundant here) and many sponges and bryozoans. The sea bed fell to the south, gently in places but elsewhere as a steep cliff with undercuts and gullies. *Parazoanthus axinellae*, *P. anguicomis*, and *Thymosia guernii* were all recorded on the cliff face together with the delicate lacework bryozoan *Reteporella (Sertella) beaniana* (verified by Dr Jo Porter).

Ten species of bryozoan were recorded here, the highest of any site. Below the rock face the site levelled off c. 35m bcd to a mud/silt bottom with cobbles, boulders and many sea fans.

50° 17.635N, 004 ° 08.465W Ballast Block site, Seasearch 12/11/2006

A dense sea fan forest covered a bedrock plateau c. 29m bcd. The south facing edge of this plateau was cut into by gullies where *Leptopsammia pruvoti* and *Thymosia guernii* were recorded as occasional, *Axinella damicornis*, the prawn cracker sponge *Axinella infundibuliformis*, *Parazoanthus axinellae*, and *P. anguicomis* all recorded as common. Continuing south and deeper to c. 36m bcd were boulders with silt and mud with abundant sea fans and much old ballast, pottery etc scattered around. The rarely recorded tadpole fish *Raniceps raninus* was identified here.



50° 17.620N, 004° 08.520W Drop Off, Seasearch 05/05/2009

On upward facing bedrock c. 28.2m bcd abundant sea fans formed a forest interspersed with *Pentapora foliacea* (common), erect sponges (generally occasional) and frequent *Parazoanthus axinellae*. The sea fan anemone *Amphianthus dohrnii* was recorded as rare on this upper area. On the south facing drop off face sea fans were common together with *Alcyonium glomeratum*, *Parazoanthus axinellae* and *Caryophyllia smithii*. The smaller Southern cup coral *C. inornata* was recorded as rare. A boulder field c. 34m bcd had both sea fans and *Pentapora foliacea* recorded as common.

50° 17.622N, 004° 08.534W KH, 08/07/2006

None seen. Followed west and to a position where ascended through a gully with ancient lobster pot on sand at top. Other divers reached the Scallop Dredge site.

50° 17.614N, 004° 08.622W Scallop Dredge site, Seasearch 04/07/2006

This site comprised an undulating rocky upward facing sea bed c. 28m bcd with abundant sea fans forming a forest, some encrusted with the anemone *Parazoanthus axinellae*. To the south a steep slope and gullies with occasional *Leptopsammia pruvoti* descended to large boulders and rock outcrops with abundant sea fans at c. 35m bcd. At this site there was part of an abandoned scallop dredge wedged against the reef wall.

50° 17.641N, 004° 08.648W

KH, 11/04/2009

Proceeded east along the boulders and tried to find way up into the canyons. Only one *Leptopsammia pruvoti* individual seen despite surface marker buoy being in right place according to boat. Other divers saw many. GPS position taken at end of dive.

50°17.641N, 004° 08.683W

KH, 21/12/2008

None seen.

50° 17.612n, 004° 08.715W

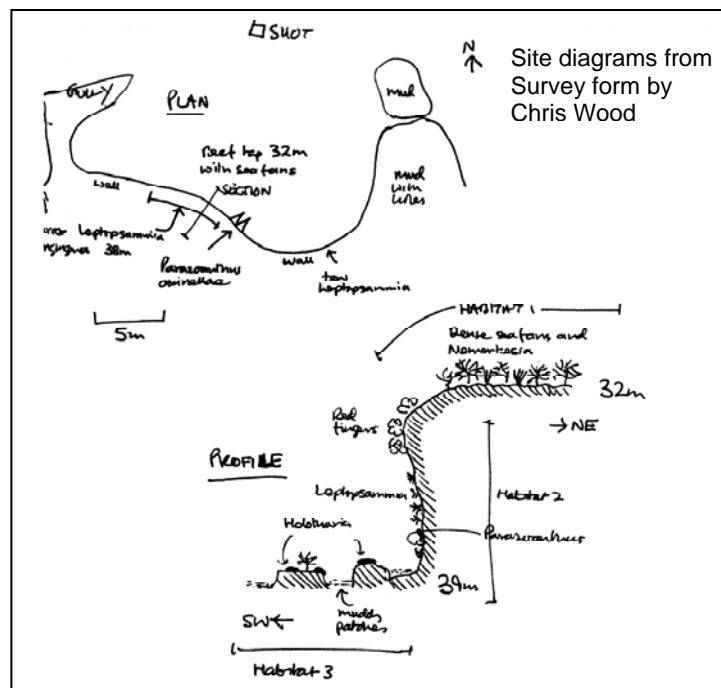
KH, 06/12/2003

A lost scallop dredge jammed in a cove. A complex area with several apparently suitable habitats but no *Leptopsammia pruvoti* seen.

50° 17.628N, 004° 08.750W

Sunset site, Seasearch 03/07/2006 and 11/11/2006

This site was surveyed twice. A south facing convoluted rock wall c. 7m high with plateau top c. 28m bcd was dominated by sea fans and hydroids especially Nemertesia. Overhanging faces approximately 7m high to the south had dense *Alcyonium glomeratum* near the top and frequent *Leptopsammia pruvoti* and *Parazoanthus* spp on overhanging areas. At the base c. 35m bcd were flat topped boulders and bedrock with muddy gullies between and many burrows in the mud. *Reteporella beaniana* was recorded as occasional on the drop off face on the second survey date.

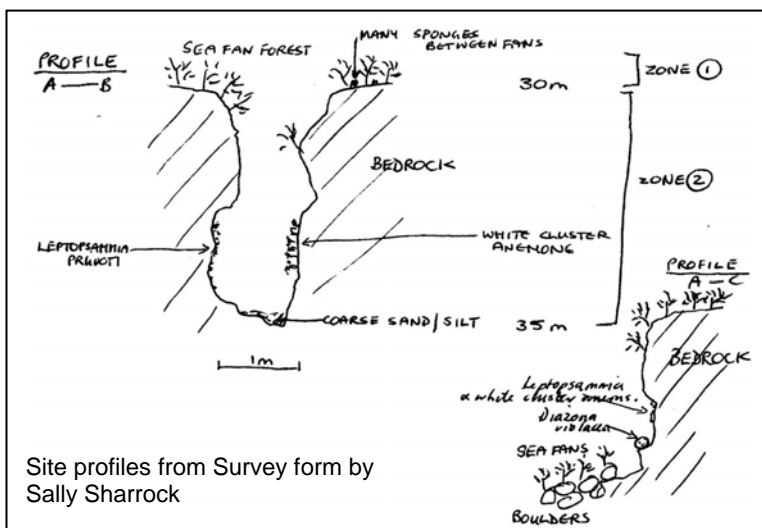


50° 17.632N, 004° 08.754W KH, 02/11/2008

Dropped onto a cliff/slight overhang with high density of *Leptopsammia pruvoti*, probably over 300 in the patch.

50° 17.642N, 004° 08.795W

Anchor site, 21/08/2006 and 09/07/2007



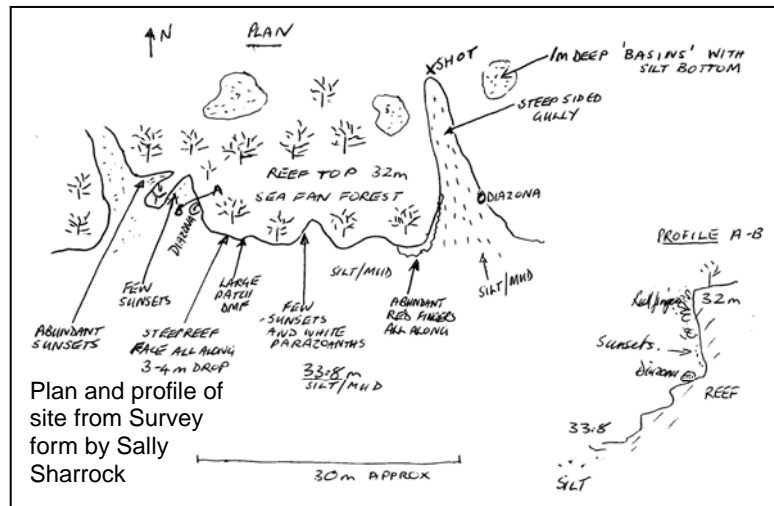
This site was also surveyed twice. Amalgamating the results from two dives from different years has given a much fuller picture of the habitat and species present and has resulted in fifteen species of cnidaria being noted, the second highest total from all the sites and nine species of bryozoans, helping to make this the site with the highest number of species recorded, fifty-seven in total. A fairly level reef top

c. 27.3m bcd with shallow depressions was dominated by sea fan forest. To the south the reef dropped away in places as a slope with superabundant sea fans but sometimes near vertically to c. 32m bcd where there were boulders on a silt covered bottom running down to c. 34.5m bcd. The reef edge had many gullies cut into it and shaded overhangs. Four cup corals, *Leptopsammia pruvoti*, *Hoplanguia durotrix*, *Caryophyllia smithii* and *C. inornata* were all recorded here together with pink fingers *Alcyonium hibernicum* and the white cluster anemone *Parazoanthus anguicomis*. One of only two records of crawfish *Palinurus elephas* came from this site, recorded in the vertical cliff face habitat. There were also some large *Diazona violacea* and human debris included an old anchor from which the site takes its name, and some cable.

50° 17.655N, 004° 08.797W

Drop Off 22/05/2009

This was noted as a very pretty dive site with fairly flat upward facing bedrock c. 30.5m bcd dominated by sea fan forest. There were vertical sided gullies with shelving rock bottoms in places, falling southwards to a fine silt/mud floor c. 33m bcd. Only the vertical and overhanging reef edge was surveyed on this dive. Abundant *Alcyonium glomeratum* all along the reef face, heading west from the shot, was interspersed with *Eunicella verrucosa* and some *Diazona violacea*. Along the reef face travelling west for about 30m there were several patches of *Leptopsammia pruvoti* with some exceptionally large specimens, the last patch being particularly prolific with up to 200 individuals estimated. This end of the dive site appears to overlap further on in the text at 50° 17.653N, 004° 09.084W.



50° 17.639N, 004° 08.809W

KH, 05/02/2006

One smallish (c 30) group of *Leptopsammia pruvoti* with some small individuals.

50° 17.640N, 004° 08.810W

KH, 10/01/2004

None seen by KH but a small group seen by other divers same site.

50° 17.632N, 004° 08.833W

KH, 12/10/2003

Rock face with *Leptopsammia pruvoti*

50° 17.613N, 004° 08.834W

KH, 11/07/2003

Over the cliff edge super little cove with high density of *Leptopsammia pruvoti* and four *Diazona violacea*.

50° 17.645N, 004° 08.840W

KH, 15/12/2007

Dropped right into a gully with extensive overhanging walls and scattered *Leptopsammia pruvoti* – several extensive patches.

50° 17.627N, 004° 08.850W

KH, 09/11/2002

One large and several small groups.

50° 17.638N, 004° 08.889W

KH, 04/07/2009

Looking for *Leptopsammia pruvoti* but only a few seen under overhang, about 14 in photo of most of overhang.

50° 17.646n, 004° 08.912W

KH, 15/12/2006

None seen.

50° 17.640N, 004° 08.920W

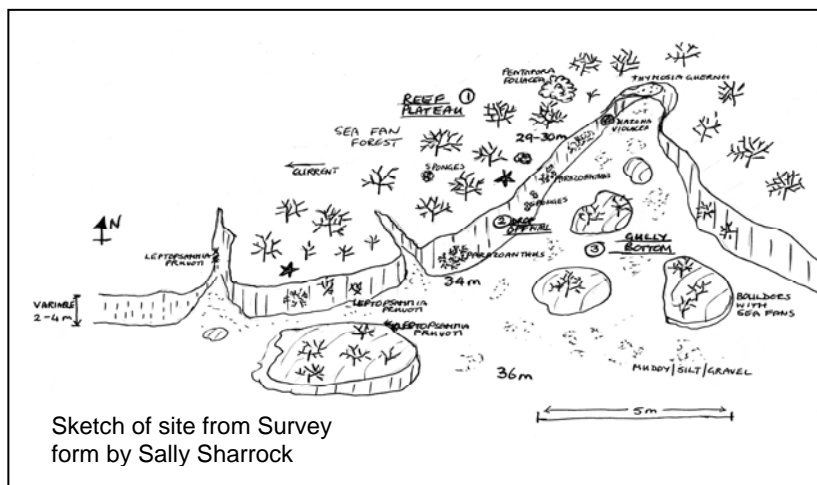
KH, 09/11/2003

None seen.

50° 17.650N, 004° 08.974W

Rope and Trawl Wheel site. Seasearch 07/10/2006

This was the second richest site for number of species recorded with eleven species of sponge and seventeen species of cnidaria contributing to a total of fifty-three species recorded on a single dive. As at most sites there was a fairly level plateau at c. 29 – 30m bcd with an extensive sea fan forest with *Amphianthus dohrnii* recorded as rare and *Caryophyllia smithii* as abundant in this habitat. A broad, open gully lead south down to c. 36m bcd with a gravel/mud/boulder base. The edges of the plateau to both east and west were considerably steeper than the broad gully sides and cut into by narrow steep sided gullies. Fauna in these narrow gullies and on the vertical and overhanging faces included *Leptopsammia pruvoti* (occasional) with *Hoplangia durotrix*, *Thymosia guernii*, *Reteporella* sp and *Diazona violacea* all recorded as rare. Some rubbish comprising discarded fishing line, weights and metal debris was also noted although the actual rope and trawl wheel which gives the site it's name was not recorded on this occasion.



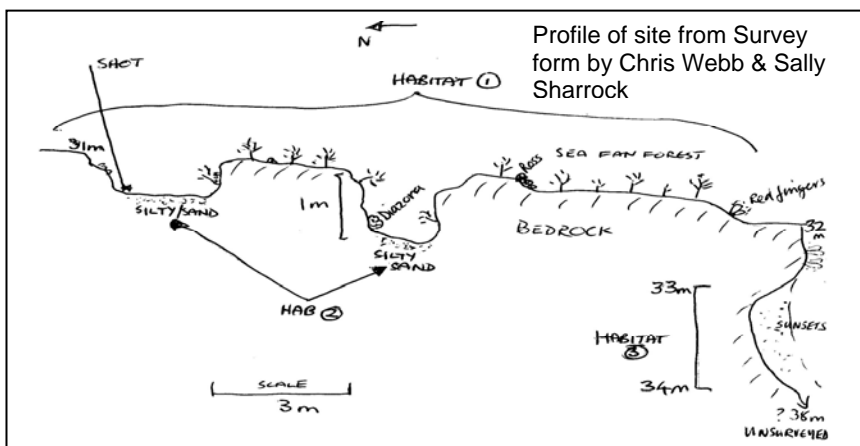
50° 17.300N, 004° 09.000W

Drop Off, Seasearch 17/06/2009

This is an approximate GPS position only and a simple Observer form record was made to record the BAP species crawfish *Palinurus elephas* of which one large berried female and two juveniles were seen at c. 37m bcd well to the south of the drop off amongst boulders.

50° 17.653N, 004° 09.084W

Drop Off, Seasearch 20/05/2009

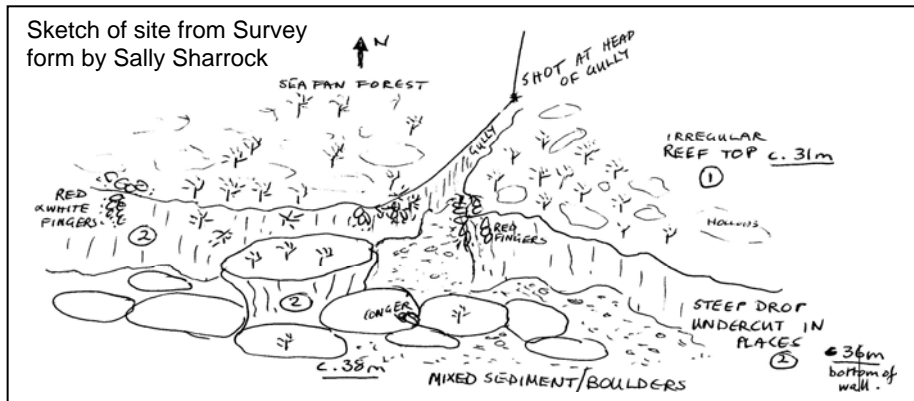


A typical drop off site with upward facing bedrock c. 27m bcd dominated by a sea fan forest fell steeply to the south as a near vertical face with overhanging shaded areas. Ragged large indentations and gullies approximately

one metre deep in the top of the reef with silt filled bottoms were notable for echinoderms *Marthasterias glacialis*, *Echinus esculentus* and *Holothuria forskali* and these depressions sometimes joined with gullies leading into the drop off face. A very large patch of mature and healthy *Leptopsammia pruvoti* was recorded on the overhanging drop off face, estimated to be 200+ in a 2m² area and appeared to be identical to that recorded at the end of the dive previously described at 50° 17.665N, 004° 08.797W.

50° 17.653N, 004° 09.111W Drop Off, Seasearch 03/07/2009

The site comprised upward facing bedrock c. 28m bcd with a sea fan forest, sponge and hydroid faunal turf including the unusual species *Polyplumaria flabellata*. The bedrock fell away to the south as a vertical and undercut wall with *Alcyonium digitatum*, *A. glomeratum*, *Parazoanthus* spp and *Diazona violacea* all present. The wall was indented with a long narrow gully. To the deeper south c. 34.5m bcd there was a boulder and bedrock field with sparser faunal turf and occasional sea fans. Eight species of bryozoan and six species of fish contributed to one of the higher species counts giving a total of forty-seven species at this site.



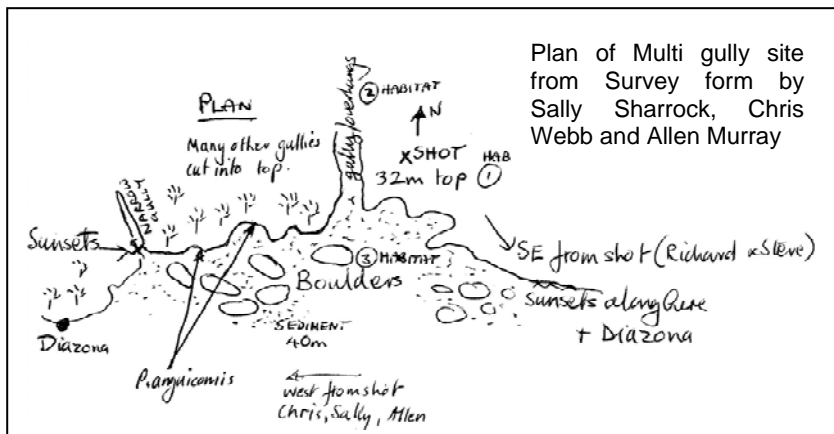
50° 17.670N, 004° 09.179W KH, 06/12/2008
Leptopsammia pruvoti at end of dive.

50° 17.680N, 004° 09.250W KH, 29/11/2008
Some divers report *Leptopsammia pruvoti*.

50° 17.692N, 004° 09.344W Drop Off, Seasearch 31/03/2007
A convoluted rocky ledge c. 28.5m bcd with sea fans recorded as common whilst to the south steep rock faces fell to 35m bcd. Some outlying bedrock outcrops created small dead end gullies. There were significant patches of *Parazoanthus anguicomis* with smaller patches of *P. axinellae*. Many sea fans were fouled by discarded angling line and disintegrating patches of netting.

50° 17.683N, 004° 09.348W KH, 30/11/2008
Working east and north a complex area of gullies looking just right for *Leptopsammia pruvoti* with eventually about 12 found in close proximity to each other.

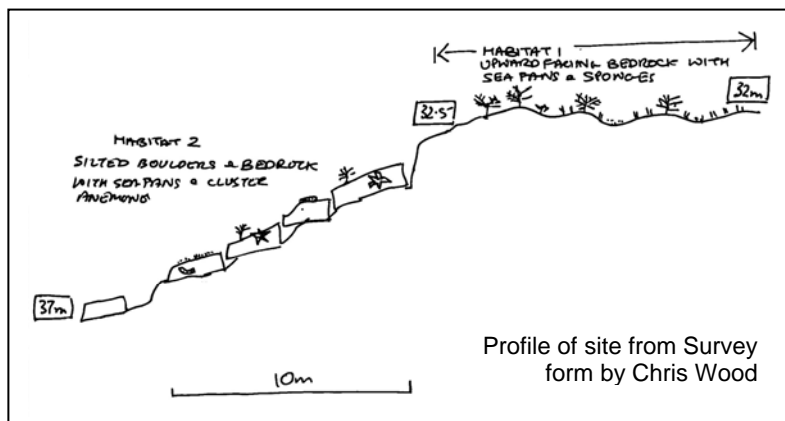
50° 17.723N, 004° 09.425W Multi Gully site, Seasearch 20/04/2009
Flattish upward facing bedrock c. 29m bcd had many deep (2-3m) gullies cut into it with sloping, vertical and undercut rock sides. Towards the south the plateau fell to c. 37m bcd with boulders and sediment. This was a physically complex site with abundant large, healthy sea fans on the upward facing surfaces. On the gully and drop off edges and vertical sections were frequent *Alcyonium glomeratum* and *Parazoanthus* spp. A few patches of sparse *Leptopsammia pruvoti* (8 per square metre in record photograph) were recorded in the shaded undercut areas to the west of the shot and similar sparse patches to the east of the shot position.



Human debris included some ordinance, rope and discarded metal objects.

50° 17.770N, 004° 09.544W Drop Off, Seasearch 15/04/2008

An undulating bedrock area at c. 30m bcd had fauna of frequent sea fans, together with one of only four records of *Amphianthus dohrnii* (recorded at this site as rare). *Parazoanthus axinellae* were common and *Axinella damicornis* occasional. A very unusual sighting was Yarrell's blenny *Chirolophus ascanii* which is usually a more northern species. The site had a slope from the plateau to the south down to 35m bcd rather than a steep drop, which was formed of bedrock and angular rock slabs. Here too sea fans were common. The small prawn cracker sponge *Axinella infundibuliformis* was recorded in this sloping habitat as occasional. Rubbish included discarded rope, plastic bags and fishing line entangled in the sea fans.



50° 17.730N, 004° 09.550W KH, 11/11/2007

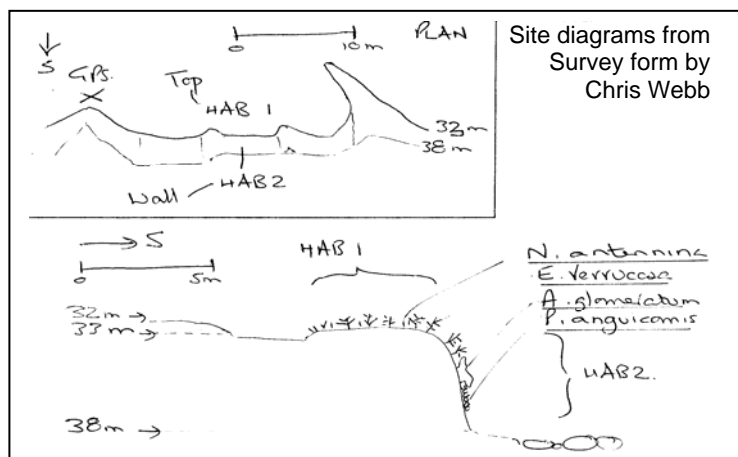
Into narrow deep gully with mud in bottom and about 100 *Leptopsammia pruvoti* on walls.

50° 17.940N, 004° 09.980W KH, 16/06/2002

None seen.

50° 17.778N, 004° 10.198N Drop Off, Seasearch 04/06/2009

This site (and subsequent ones) is in the western survey block, i.e. to the west of the ancient river bed. Sites on this side generally had more silt and worse visibility than those in the eastern survey block. The south facing wall about 5-6m high, continuous for at least 30m to east of GPS position, rose to a fairly flat reef with a very dense sea fan forest on the upward facing surface c. 28m bcd. Nine



species of sponge including (unusual for these habitats) the hedgehog sponge *Polymastia boletiformis* and the chimney sponge *Polymastia penicillus* were recorded at this site. Amongst cnidaria *Parazoanthus anguicomis* was abundant on the wall whilst *P. axinellae* was less frequent and the white striped anemone *Actinothoe sphyrodeta* was occasional mainly on the sea fans as a fouling species. The highest number of echinoderms of all the sites at eight species contributed to a relatively large total of fifty-one species. Some electrical wire and old ordinance was also recorded.

50° 17.780N, 004° 10.380W KH, 22/05/2003
None seen.

50° 17.805N, 004° 10.424W Drop Off, Seasearch 03/06/2009 and 18/08/2009
Upward facing heavily silted bedrock with exceptionally abundant sea fan forest fell away from c. 28m bcd to 37m bcd southwards as a steep drop with gullies and overhangs with abundant *Parazoanthus anguicomis* and *Alcyonium glomeratum*. One diver recorded a possible small patch of approximately twelve *Leptopsammia pruvoti* on the first dive but they were not photographed and as such can not be verified at this stage. If substantiated this would be the only record in the west survey block and the most westerly record in this area so far. For this reason Seasearch carried out a second dive at this site. Visibility was poor but the divers were asked to cover the area purely to look for *Leptopsammia pruvoti* under overhangs or in narrow gullies. Approximately 30m of reef edge was searched and no specimens seen, hence the record from the first dive at this site has to remain doubtful.

50° 17.781N, 004° 10.577W Drop Off, Seasearch 19/06/2009
The upward facing bedrock plateau c. 29m bcd dominated by sea fan forest became sloping and vertical bedrock to the south. *Eunicella verrucosa* was also frequent on the wall together with occasional *Alcyonium* spp and frequent *Caryophyllia smithii* and a mixed faunal turf of *Nemertesia antennina* and bryozoans. There appeared to be a poorer sponge fauna at this site compared with other sections of the drop off surveyed. Some metal rubbish was recorded. This was the most westerly site surveyed for this report.

5 Discussion

5.1 BAP species

Four BAP species, *Leptopsammia pruvoti*, *Eunicella verrucosa*, *Amphianthus dohrnii* and *Palinurus elephas*, were recorded on these dives.

Sunset cup coral *Leptopsammia pruvoti*

Verified records are from the area surveyed between longitude 004° 08.465W and 004° 09.550W. All are to the east side of the old river bed contour and all fall within the bounds of the recently designated proposed SAC. There is evidence of large healthy groups with 200+ mature individuals and small recruits and also some sparsely distributed individuals, all on overhanging rock or shaded gully areas.

Sites will need to be resurveyed on an ongoing basis to ascertain alteration in sizes of populations, degeneration and/or recruitment. To facilitate correct relocation it would be advantageous to clearly mark underwater a large healthy site and a contrasting small population for an ongoing study.

There is just one doubtful (unverified by photograph) record of *Leptopsammia pruvoti* from 50° 17.805N, 004° 10.424W in the western survey block. The other three dives from this west side failed to record any *Leptopsammia pruvoti* despite the habitat looking right

and all the other associated species being present. The reason for lack of specimens on this western side is not known but a factor could be that the outgoing current from Plymouth Sound swings to the west and is slightly stronger than it is around the eastern survey area. The area was also more heavily silted and generally appeared to have poorer visibility.

All positive sightings from dives, together with Seasearch dive sites where none were recorded, have been plotted on the map prepared by Gavin Black in Appendix 1.

A listing of all sites where *Leptopsammia pruvoti* was recorded, together with abundances, is given in Appendix 3.

Pink sea fan *Eunicella verrucosa*

Despite the area being classed as exposed all sites were found to have extensive *Eunicella verrucosa* forest. It is assumed that a depth of 28m bcd + is sufficient to protect the fans from the worst of the south-westerly storms and wave action. The fans were generally more dense on the shallower upward facing or sloping bedrock. The density of sea fans on the plateau has been estimated as in excess of 10 per square metre (Ecology of the pink sea fan – Dr Keith Hiscock 2004). This gives an approximate population in this area of 1,500000. Most of the fans surveyed were in a healthy condition and well grown indicating a long established, stable community. A small proportion had some fouling faunal growth, usually hydroid, bryozoan or ascidian. Very few were found to have the sea fan nudibranch *Tritonia nilsodnheri* on - it was recorded as rare or occasional at only six sites. This nudibranch has however been found to be variable in abundances over the years and no firm conclusion should be drawn from the few sightings. The false cowrie *Simnia* sp. is also found on sea fans but was recorded at only one site – the species may be new to science and dna studies are currently underway (Felix Lorenz, pers. comm. to K. Hiscock).

Sea fans are a fragile slow growing species vulnerable to damage from bottom trawling or netting and there was some evidence of human impact – fishing line, ropes and weights were not uncommon, an old abandoned scallop dredge (most likely lost when it engaged with the cliff) was recorded at one site, a trawl wheel at another and a discarded gill net has been photographed on one site. Monofilament bottom nets are set on or just off the Drop-off and, on 5 February 2006, one was photographed (by K. Hiscock) amongst but apparently not snagging the sea fan forest. At present the whole of the plateau area is outside the current SAC and afforded no protection. However the plateau and drop off area to the east of the old river bed falls within the recently proposed draft Prawle Point to Plymouth Sound SAC.



Gill net amongst Pink sea fan forest at "Sunset" site.
Photo Dr Keith Hiscock

Sea fan anemone *Amphianthus dohrnii*

This is a nationally rare species and was recorded (as rare) at just four of the sites. It appears to have a very patchy distribution, being found on some of the shallower reefs off Plymouth and also at some of the offshore reefs. At none of these is it ever more than rare. Little is known about the larval dispersal of this anemone. It is however locally common on the nearby wreck of the Rosehill in Whitsand Bay, Cornwall, at a depth of c. 28m bcd where it can be found on many of the sea fans and sometimes in considerable numbers to the detriment of the sea fans. A separate long term study of that population is being conducted by Seasearch.

Crawfish *Palinurus elephas*

This rare crustacean was recorded at two sites. Encouragingly one of the records is for a group of three – two juveniles and a large berried female. A new (2009) Seasearch reporting scheme is asking all divers to record sightings on-line to build up more comprehensive information about these rarely sighted animals. It is known they favour deeper water below 30m and since most Seasearch dives are shallower, this could be a contributory reason for lack of sightings.

5.2 Species by phyla

Detailed species lists for each Seasearch site are given in Appendix 2.

This discussion focuses only on the Seasearch recorded sites. The Observer form to record *Palinurus elephas* is discounted from the total number of forms for the purposes of this discussion.

The main emphasis of these dives was to look for and record *Leptopsammia pruvoti*, hence some less easily distinguished species will inevitably have been missed. Time at depth was also very limited and the visibility not always conducive to easy recording. Species records also vary depending on the expertise of the survey group members although over a longer series of dives, as in this case, that becomes less of a factor.

Porifera

Sponges were recorded on all sites but numbers and abundance of species were not as prolific as at other (generally shallower) rocky reef sites dived from Plymouth. *Cliona celata* was recorded at all but one site. Three axinellid sponges were recorded at most sites, *Axinella dissimilis* and *A. infundibuliformis* usually found on the upward facing rock whilst *A. damicornis* (considered nationally scarce) was found mainly on the vertical or shaded areas.



Axinella damicornis covered by *Parazoanthus axinellae*

This small sponge appears to be often associated with the anemone *Parazoanthus axinellae* which attaches to it - possibly the sponge's convoluted form gives the anemone's stolons a good toehold. *Thymosia guernii* is another nationally scarce sponge and was found at seven sites on vertical and overhanging sections.

Cnidaria

Hydroid records were variable depending on time of year. There were just two records of the unusual hydroid *Polyplumaria flabellata* whereas *Nemertesia antennina* was identified at thirteen sites, but it is also the easiest hydroid to recognise. *Alcyonium digitatum* and *A. glomeratum* were both recorded at all sites with *A. glomeratum* often abundant. This soft coral appears to have two distinctly different forms, one being a fairly stocky finger, in colour anything from dark red to pale orange, the other form being a much longer thinner finger, rather lax and hanging more downwards, always a pale orange and resembling the Mediterranean *Alcyonium pallidus*. The two forms are often found together, as in the picture here and are recorded as the same species however dna work on these two forms might give some interesting results.



Both 'forms' of *Alcyonium glomeratum*

The tiny pink soft coral *Alcyonium hibernicum* was recorded on shaded overhanging areas at just two sites. *Eunicella verrucosa*, as previously discussed, was present at all sites and often superabundant. *Parazoanthus axinellae* was abundant at two sites



The white cluster anemone *Parazoanthus anguicomis* together with the sea squirt *Ascidia mentula*

but recorded at all. A white form, recorded as *Parazoanthus anguicomis*, was recorded at eleven sites and abundant at two. White *Parazoanthus* are not uncommon around the south west and although usually recorded as *P. anguicomis* it is possible they may be a white form of *P. axinellae*. Jewel anemones *Corynactis viridis*, so widespread on other reefs around the Plymouth area were surprisingly only recorded on one site - possibly the water is too silt laden for them here, the rock does always have a covering of silt. *Amphianthus dohrnii* was recorded as rare at four sites, always on sea fans.

Four species of cup corals were recorded – *Caryophyllia smithii* at fifteen sites, *C inornata* at eight and the tiny *Hoplangia durotrix* at just three (but it is very difficult to spot with the naked eye). *Leptopsammia pruvoti* was recorded at nine of the Seasearch sites and at twenty-two sites in total.

Crustacea

Crustacea were few and far between. Barnacles were abundant at four sites and probably very under-recorded overall. The cup coral barnacle *Megatrema anglicum* was recorded at just at one site but is most likely widely distributed and has been seen in close-up images on *Leptopsammia pruvoti* at the 'Anchor' site (K. Hiscock, pers. comm.) *Homarus gammarus* was seen at five sites and *Palinurus elephas* at just two. The commonest recorded crustacea were the edible crab *Cancer pagurus* at ten sites and the velvet swimming crab *Necora puber* at eight.

Mollusca

Molluscs appeared to be rare. Surprisingly (or possibly not, considering the number of sea fans) the commonest was the nudibranch *Tritonia nilsodhneri* which was found at six sites.

Bryozoa

Pentapora foliacea was by far the commonest bryozoan, recorded at fifteen sites. Colonies were often large and encrusted with other fauna. The small hard branching bryozoan *Omalosecosa ramulosa* was found at ten sites often attached to sea fans or other erect fauna and indeterminate bryozoan crusts were recorded at twelve sites. There were interesting records of the small lacework bryozoan *Reteporella beaniana* which was recorded at four of the easterly sites on the vertical faces but only in 2006 and 2007. It is impossible to say if those were fleeting settlements or whether it has simply been overlooked in succeeding years.



Omalosecosa ramulosa on *Cellaria* sp.

Echinodermata

Marthasterias glacialis, *Echinus esculentus* and *Holothuria forskali* were all recorded at all sixteen sites. Although found in all habitats they were most common in the deepest habitat on the boulders which were consequently more grazed than elsewhere and had a sparser faunal turf. *Henricia oculata* was recorded at twelve sites as occasional or rare.

Tunicata

Many of the sites had extensive patches of large sea squirts heavily silted and difficult to identify. There has been some discussion over the correct identification but they are thought to be *Ascidiella aspersa*. The orange sea squirt *Stolonica socialis* was recorded at thirteen sites and was common or frequent at many of those becoming the most widespread tunicate closely followed by *Diazona violacea* which was found at twelve sites and is known to prefer these deeper habitats. The nationally scarce sparkling sea squirt *Pycnoclavella aurilucens* was noted at only one site, attached to a sea fan.



Pycnoclavella aurilucens

Pisces

Fish in general were poorly represented. Lack of shelter for large shoals and no weed cover at this depth for individuals would be a contributory factor. *Cenolabrus rupestris* was commonest and present at eleven sites and all five of the common wrasse were represented. Unusual sightings were the tadpole fish *Raniceps raninus* which is rarely seen and Yarrell's blenny *Chirolophis ascanii* which is more common in northern waters.



Chirolophis ascanii

Algae

As would be assumed, algae were almost non-existent at these depths, pink encrusting recorded at just three sites as occasional and mixed red weed at three sites generally as rare.

Acknowledgements

The author would like to thank all of the volunteer divers who gave their time to this project and to skippers Richard Lock with Kara-C and Danny Daniels and Dave Handley of Discovery Divers for putting us so accurately on the sites. Dr Keith Hiscock has been extremely helpful in providing GPS locations, personal log book reports and much other information. Dr Jo Porter and Bernard Picton have assisted with identifications of species.

Gavin Black from Natural England assisted with production of the map on page 20.

Seasearch is a volunteer underwater survey project for recreational divers, enabling them to contribute to protecting marine wildlife through recording underwater habitats and the plants and animals they support. Seasearch provides training for volunteer divers and organises dives and survey expeditions.

Seasearch is co-ordinated by the Marine Conservation Society on behalf of the Seasearch Steering Group which comprises the Marine Conservation Society, Wildlife Trusts, Joint Nature Conservation Committee, Natural England, Countryside Council for Wales, Scottish Natural Heritage, Environment and Heritage Service Northern Ireland, Environment Agency, Marine Biological Association, Nautical Archaeological Society, British Sub Aqua Club, Sub Aqua Association, Professional Association of Diving Instructors, Scottish Sub Aqua Club, Irish Underwater Council and independent marine life experts.

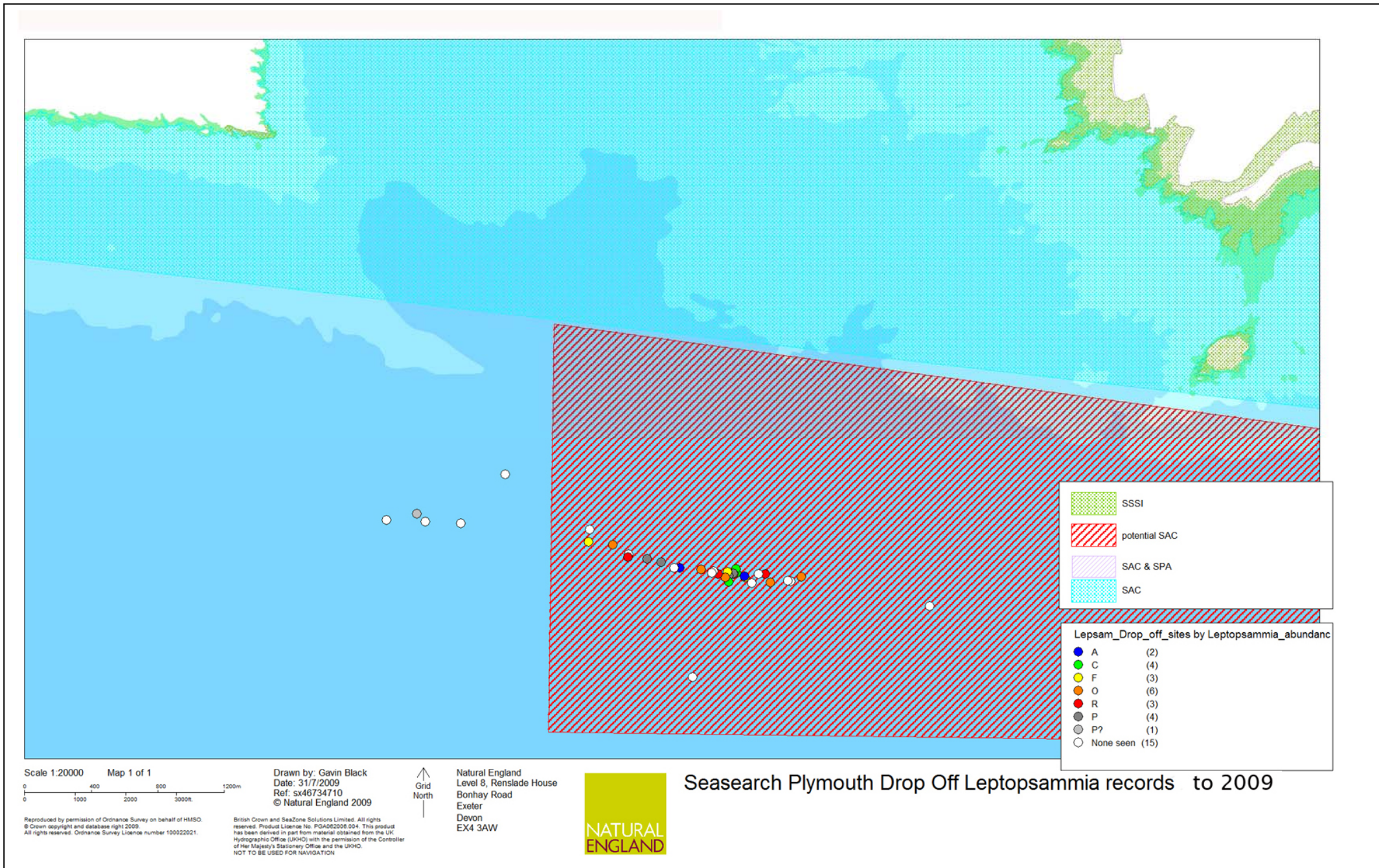
Seasearch is funded in Devon by Natural England.

Details of all Seasearch activities, including training courses and survey dives can be found on the Seasearch website at www.seasearch.org.uk

References

- Connor, D, and Hiscock, K (1996) Data collection methods, in: Marine Nature Conservation Review: Rationale and methods (ed. K Hiscock), 51–65 and Appendices 5–10, 126–158. Peterborough, Joint Nature Conservation Committee.
- Hiscock, K Ecology of the pink sea fan (PowerPoint presentation)
- Sharrock, S Seasearch Plymouth Reefs 2005 Report
- Wood, C Seasearch South Devon Reefs Survey July 2003 Report
- Wood, C Pink Sea Fan Surveys 2004 – 2006
- Wood, C Observer's Guide to Marine Life of Britain and Ireland
- Wood, C Seasearch Guide to Sea Anemones and Corals of Britain and Ireland

Appendix 1 Map of Seasearch Plymouth Drop Off Leptopsammia records



Appendix 2 Species lists from Seasearch sites

Abundance maximum as listed on each Seasearch form for those sites surveyed by Seasearch divers.

The scale used is: A = abundant, C = common, F = frequent, O = occasional, R = rare, P = present

GPS positions Listed from east to west		50° 17.552N 004° 07.810W	50° 17.635N 004° 08.465W	50° 17.620N 004° 08.520W	50° 17.614N 004° 08.622W	50° 17.628N 004° 08.750W	50° 17.642N 004° 08.795W	50° 17.655N 004° 08.797W	50° 17.650N 004° 08.974W	50° 17.300N 004° 09.000W	50° 17.653N 004° 09.084W	50° 17.653N 004° 09.111W	50° 17.692N 004° 09.344W	50° 17.723N 004° 09.425W	50° 17.770N 004° 09.544W	50° 17.778N 004° 10.198W	50° 17.805W 004° 10.424W	50° 17.781N 004° 10.577W	No of sites
Species recorded																			
Porifera	Sponges																		
<i>Scypha ciliata</i>	Purse sponge			O		R		F										P	4
<i>Pachymatisma johnstonia</i>	Elephant hide sponge	O					O	O	R			P				R			5
<i>Thymosia guernei</i>	Mashed potato sponge	O	O		O	O	R		R									R	7
<i>Tethya citrina</i>	Golf ball sponge			R											R				2
<i>Suberites carnosus</i>																	R		1
<i>Suberites ficus</i>	Sea orange															O			1
<i>Homaxinella subdola</i>															F				1
<i>Polymastia boletiformis</i>	Hedgehog sponge															R			1
<i>Polymastia penicillus</i>	Chimney sponge						R									R			2
<i>Cliona celata</i>	Boring sponge	O	C	O	O	F	O	R	C		O	O	O		O	O	O	O	15
<i>Stelligera rigida</i>		F		O					C			P							4
<i>Stelligera stuposa</i>									R										1
<i>Raspailia hispida</i>					O						O								2
<i>Raspailia ramosa</i>	Chocolate finger sponge	R				O			R							O		P	5
<i>Iophon hyndmani</i>	Niknak sponge			R							C	F				R	R		5
<i>Iophon nigricans</i>				F															1
<i>Axinella dissimilis</i>	Yellow staghorn sponge	F	R	O	O	O	O	P	C		O	O	R	O	O			R	14
<i>Axinella infundibuliformis</i>	Prawn cracker sponge	O	C	O		R	O		O		O		R	R	O	R			11
<i>Axinella damicornis</i>	Crumpled yellow sponge	O	C	O	F	C	R	O	C		C	O	O	O	O			O	14
<i>Haliclona oculata</i>	Mermaid's glove			O								O				R			3
<i>Haliclona simulans</i>	Creeping sponge								R										1
<i>Haliclona sp</i>																	R		1
<i>Dysidea fragilis</i>	Goosebump sponge								R										1
<i>Aplysilla sulphurea</i>			R?																1
24		8	6	10	5	7	7	5	11	0	6	7	4	3	6	9	4	6	

GPS positions		50° 17.552N 004° 07.810W	50° 17.635N 004° 08.465W	50° 17.620N 004° 08.520W	50° 17.614N 004° 08.622W	50° 17.628N 004° 08.750W	50° 17.642N 004° 08.795W	50° 17.655N 004° 08.797W	50° 17.650N 004° 08.974W	50° 17.300N 004° 09.000W	50° 17.653N 004° 09.084W	50° 17.653N 004° 09.111W	50° 17.692N 004° 09.344W	50° 17.723N 004° 09.425W	50° 17.770N 004° 09.544W	50° 17.778N 004° 10.198W	50° 17.805W 004° 10.424W	50° 17.781N 004° 10.577W	No of sites
Cnidaria	Hydroids, Anemones, Corals																		
<i>Tubularia indivisa</i>	Oaten pipe hydroid										R								1
<i>Halecium halecinum</i>	Herringbone hydroid	O				P	P										O		4
<i>Abietinaria</i> sp									O										1
<i>Sertularella gayi</i>		C	C						O			O				O			5
<i>Nemertesia antennina</i>	Antenna hydroid	O		O	C	C	F		O		O	C		O	O	O	F	O	13
<i>Nemertesia ramosa</i>	Branched antenna hydroid			R	C	C		F				F		O			O		7
<i>Polyplumaria flabellata</i>											R	R							2
<i>Aglaophenia pluma</i>		R				F			O			R			F		P		6
<i>Aglaophenia tubulifera</i>											R?								1
<i>Gymnangium montagui</i>	Indian feathers hydroid								O										1
<i>Feather hydroids indet</i>			A	F			P		O				R			O		F	7
<i>Obelia geniculata</i>	Kelp fir	O					R												2
<i>Alcyonium digitatum</i>	Dead men's fingers	O	O	F	C	C	C	F	C		O	C	O	O	O	F	O	O	16
<i>Alcyonium glomeratum</i>	Red fingers	F	C	C	C	A	C	A	C		C	C	C	F	O	C	A	F	16
<i>Alcyonium hibernicum</i>	Pink fingers						R	R											2
<i>Eunicella verrucosa</i>	Pink sea fan	SA	A	A	A	A	SA	F	A		A	A	C	A	F	A	SA	A	16
<i>Epizoanthus couchii</i>	Sandy creeplet	R	O						R										3
<i>Parazoanthus anguicomis</i>	White cluster anemone	R	C			R	A	R	C		R		O	F		C	A		11
<i>Parazoanthus axinellae</i>	Yellow cluster anemone	A	C	C	F	A	O	F	C		O	F	R	F	F	F	F	F	16
<i>Actinothoe sphyrodeta</i>	White striped anemone				R											O			2
<i>Amphianthus dohrnii</i>	Sea fan anemone			R			R		R						R				4
<i>Corynactis viridis</i>	Jewel anemone																P		1
<i>Caryophyllia inornata</i>	Southern cup coral	R	R	R			O		R			P			P	R			8
<i>Caryophyllia smithii</i>	Devonshire cup coral	A	C	F		F	C	C	A		C	F	F	O	F	C	C	C	15
<i>Hoplangia durotrix</i>	Weymouth carpet coral						O	R	R										3
<i>Leptopsammia pruvoti</i>	Sunset cup coral		O		O	F	C	C	O		A			O			R?		9
26		13	11	10	8	11	15	10	17	0	11	11	7	9	9	11	12	7	

GPS positions		50° 17.552N 004° 07.810W	50° 17.635N 004° 08.465W	50° 17.620N 004° 08.520W	50° 17.614N 004° 08.622W	50° 17.628N 004° 08.750W	50° 17.642N 004° 08.795W	50° 17.655N 004° 08.797W	50° 17.650N 004° 08.974W	50° 17.300N 004° 09.000W	50° 17.653N 004° 09.084W	50° 17.653N 004° 09.111W	50° 17.692N 004° 09.344W	50° 17.723N 004° 09.425W	50° 17.770N 004° 09.544W	50° 17.778N 004° 10.198W	50° 17.805W 004° 10.424W	50° 17.781N 004° 10.577W	No of sites
Platyhelminthes	Flatworms																		
<i>Prostheceraeus vittatus</i>	Candy striped flatworm											R				R			2
1		0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	
Annelida	Segmented worms																		
<i>Lanice conchilega</i>	Sand mason	O																	1
<i>Bispira voluticornis</i>	Double spiral worm					R										R			2
<i>Pomatoceros spp</i>	Keelworm	O																	1
<i>Pomatoceros triquiter</i>	Keelworm						F												1
<i>Protula tubularia</i>	Red spiral worm	O	O	R		R	O					R		R				O	8
<i>Filograna/Salmacina</i>	Coral worm		R						R					R					3
6		3	2	1	0	2	2	0	1	0	0	1	0	2	0	1	0	1	
Crustacea	Crustacea																		
<i>Verruca stroemia</i>	Barnacle	A	A			C	A		A		O								6
<i>Megatrema anglicum</i>	Cup coral barnacle						F												1
<i>Palaeomon serratus</i>	Common prawn								O										1
<i>Homarus gammarus</i>	Lobster		R		R							R					R	R	5
<i>Palinurus elephas</i>	Crawfish/spiny lobster						R			R									2
<i>Galathea strigosa</i>	Spiny squat lobster						R												1
<i>Maja squinado</i>	Spiny spider crab	R											O		R	R			4
<i>Cancer pagurus</i>	Edible crab			R	R		R		O		R	O		R	R	R	R		10
<i>Necora puber</i>	Velvet swimming crab	F		R			O		R		R	R			R	O			8
9		3	2	2	2	1	6	0	4	1	3	3	1	1	3	3	2	1	
Mollusca	Molluscs																		
<i>Calliostoma zizyphinum</i>	Painted top shell						R		R										2
<i>Trivia monaracha</i>	European cowrie											R							1
<i>Simnia patula</i>	False cowrie										R								1
<i>Tritonia nilsodnheri</i>	Sea fan nudibranch	R		O					R		O				R		P		6
<i>Flabellina pedata</i>	Violet sea slug															R			1
5		1	0	1	0	0	1	0	2	0	2	1	0	0	1	1	1	0	

GPS positions		50° 17.552N 004° 07.810W	50° 17.635N 004° 08.465W	50° 17.620N 004° 08.520W	50° 17.614N 004° 08.622W	50° 17.628N 004° 08.750W	50° 17.642N 004° 08.795W	50° 17.655N 004° 08.797W	50° 17.650N 004° 08.974W	50° 17.300N 004° 09.000W	50° 17.653N 004° 09.084W	50° 17.653N 004° 09.111W	50° 17.692N 004° 09.344W	50° 17.723N 004° 09.425W	50° 17.770N 004° 09.544W	50° 17.778N 004° 10.198W	50° 17.805W 004° 10.424W	50° 17.781N 004° 10.577W	No of sites
Bryozoa	Sea mats/ sea mosses																		
<i>Crisia spp</i>	Crispy threads	C	O								C	F				F	F	R	7
<i>Alcyonidium diaphanum</i>	Finger bryozoan	C				O					O	O		R		C	O		7
<i>Bugula plumosa</i>	Spiral bryozoan								C			O						R	2
<i>Bugula turbinata</i>	Spiral bryozoan											O				R		R	3
<i>Bugula flabellata</i>	Spiral bryozoan	R		O		O	P				O								5
<i>Bugula sp</i>	Spiral bryozoan			R															1
<i>Bugula calathus</i>							O?												1
<i>Umbonula sp</i>			O				O												2
<i>Cellaria spp</i>		C	C	C			C		O		C				P		O		8
<i>Porella compressa</i>			O																1
<i>Schizomavella linearis</i>		C					C												2
<i>Pentapora foliacea</i>	Potato crisp bryozoan	F	C	C	P	F	O		C		F	O	O	O	O	O	O	O	15
<i>Cellepora pumicosa</i>	Orange pumice bryozoan	O					R					P							3
<i>Reteporella beaniana</i>	Lace bryozoan	R	C			O			C										4
<i>Omalosecosa ramulosa</i>	Monkey puzzle bryozoan	C			P	F	C		C		O	O				O	R	F	10
<i>Bryozoa indet crusts</i>	Encrusting bryozoans	C		F			R	O			F	P	C	F	O	C	O	O	12
16		10	6	5	2	5	9	1	5	0	7	8	2	3	3	6	6	5	
Echinodermata	Echinoderms																		
<i>Luidia ciliaris</i>	Seven armed starfish						O	O	R		R	R		O		O		R	8
<i>Henricia oculata</i>	Bloody Henry	R	O	R	P	O	R	R	R		R		R		O	O			12
<i>Martasterias glacialis</i>	Spiny starfish	O	C	O	P	O	C	R	O		O	O	C	O	F	F	O	F	16
<i>Ophiopholis aculeate</i>	Crevice brittlestar	O																	1
<i>Echinus esculentus</i>	Common sea urchin	O		O	P	O	C	O	O		O	O	C	O	O	O	R	O	15
<i>Holothuria forskali</i>	Cotton spinner	O	C	C	P	C	O	O	O		O	O	C	F	F	F	O	O	16
<i>Aslia lefevrei</i>	Crevice cucumber			R		P		P			R	F		R		O	O	R	9
<i>Pawsonia saxicola</i>	White crevice cucumber										R				R				2
<i>Asterias rubens</i>	Common starfish												O			O			2
<i>Ophiuridae sp</i>	Brittlestars															F			1
10		5	3	5	4	5	5	6	5	0	7	5	5	5	5	8	4	5	
Tunicata	Sea squirts																		
<i>Clavelina lepadiformis</i>	Lightbulb sea squirt	R		R				R			R			R	R	O	P		8
<i>Pycnoclavella aurilucens</i>	Sparkling sea squirt										R								1
<i>Morchellium argus</i>	Four spotted squirt			O															1
<i>Aplidium punctum</i>	Club head sea squirt			O															1
<i>Diplosoma spongiforme</i>	Sponge sea squirt		R				O												2

GPS positions		50° 17.552N	50° 17.635N	50° 17.620N	50° 17.614N	50° 17.628N	50° 17.642N	50° 17.655N	50° 17.650N	50° 17.300N	50° 17.653N	50° 17.653N	50° 17.692N	50° 17.723N	50° 17.770N	50° 17.778N	50° 17.805W	50° 17.781N	No of sites
		004° 07.810W	004° 08.465W	004° 08.520W	004° 08.622W	004° 08.750W	004° 08.795W	004° 08.797W	004° 08.974W	004° 09.000W	004° 09.084W	004° 09.111W	004° 09.344W	004° 09.425W	004° 09.544W	004° 10.198W	004° 10.424W	004° 10.577W	
	<i>Lissoclinum perforatum</i>														R				1
	<i>Diazona violacea</i>		R	R		O	R	O	R			O	O			F	O	O	12
	<i>Ascidia conchilega</i>	R																	1
	<i>Ascidiella aspersa</i>			C			O	P				F		C?		C	C?	O	8
	<i>Ascidea virginea</i>						R?												1
	<i>Dendrodoa grossularia</i>														O				1
	<i>Stolonica socialis</i>	A		F		C	C	F	R		C	O		F	F	F	O	F	13
	<i>Botryllus schlosseri</i>	O																	1
13		4	2	6	1	2	5	4	2	0	4	3	0	4	4	4	4	3	
Pisces	Fish																		
	<i>Scyliorhinus canicula</i>		R			R	R		R		R		R			R			7
	<i>Conger conger</i>								R			R				O			3
	<i>Pollachius pollachius</i>						O		O			F	O		O				5
	<i>Raniceps raninus</i>		R																1
	<i>Trisopterus luscus</i>					O		C											2
	<i>Trisopterus minutus</i>			O	P						P	P		O	C	F			6
	<i>Centrolabrus exoletus</i>											O	R						2
	<i>Crenilabrus melops</i>															O			1
	<i>Ctenolabrus rupestris</i>	C		R		O	C	R			R	P	O	R	O	O	O		11
	<i>Labrus bergylta</i>						O												1
	<i>Labrus mixtus</i>				P	O	O	R	O		R	P	O		F	R			9
	<i>Parablennius gattorugine</i>	R					R		O				O						4
	<i>Chirolophis ascanii</i>														R				1
	<i>Pomatoschistus spp</i>															O			1
	<i>Thorogobius ephippiatus</i>	R	R				R		R						R				5
	<i>Zeugopterus punctatus</i>			R															1
16		3	3	3	2	4	7	3	6	0	4	6	6	2	6	7	1	0	
Algae	Seaweeds																		
	Coralinacea			O							O			O					3
	Rhodophycota			R							O	R							3
2		0	0	2	0	0	0	0	0	0	2	1	0	1	0	0	0	0	
Total species	128	50	35	45	24	37	57	29	53	1	46	47	25	30	37	51	34	28	

Appendix 3 Listing of all sites with *Leptosammia pruvoti* sightings

	Site GPS position	Site name	Abundance	Recorded by
1	50° 17.635N, 004° 08.465W	Ballast block site	O	Seasearch
2	50° 17.614N, 004° 08.622W	Scallop dredge site	O	Seasearch
3	50° 17.641N, 004° 08.648W		R	K Hiscock
4	50° 17.628N, 004° 08.750W	Sunset site	F	Seasearch
5	50° 17.632N, 004° 08.754W		A	K Hiscock
6	50° 17.642N, 004° 08.795W	Anchor site	C	Seasearch
7	50° 17.655N, 004° 08.797W	Drop off	C	Seasearch
8	50° 17.639N, 004° 08.809W		O	K Hiscock
9	50° 17.640N, 004° 08.810W		P	Other divers
10	50° 17.632N, 004° 08.833W		P	K Hiscock
11	50° 17.613N, 004° 08.834W		C	K Hiscock
12	50° 17.645N, 004° 08.840W		F	K Hiscock
13	50° 17.627N, 004° 08.850W		O	K Hiscock
14	50° 17.638N, 004° 08.889W		R	K Hiscock
15	50° 17.650N, 004° 08.974W	Rope & Trawl site	O	Seasearch
16	50° 17.653N, 004° 09.084W	Drop off	A	Seasearch
17	50° 17.670N, 004° 09.179W		P	K Hiscock
18	50° 17.680N, 004° 09.250W		P	Other divers
19	50° 17.683N, 004° 09.348W		R	K Hiscock
20	50° 17.723N, 004° 09.425W	Multi-gully site	O	Seasearch
21	50° 17.730N, 004° 09.550W		F	K Hiscock
22	50° 17.805N, 004° 10.424W	Drop off	P?	Seasearch