

seasearch

Seasearch Survey of Sark
June 2008

Chris Wood



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A report to La Société Sercquaise
by
Chris Wood



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Seasearch

Seasearch is a volunteer underwater survey project for recreational divers to record observations of marine habitats and the life they support. The information gathered is used to increase our knowledge of the marine environment and contribute towards its conservation. Seasearch is coordinated by a Steering Group led by the Marine Conservation Society and including representatives from the UK statutory conservation bodies (NE, CCW, SNH, NIEA, JNCC), the Environment Agency, The Wildlife Trusts, the Marine Biological Association, the diver training agencies (BSAC, PADI, SAA, SSAC), Nautical Archaeology Society and independent marine life experts. Seasearch is supported financially by all of the UK statutory conservation agencies and the Environment Agency. Volunteer divers can participate in training courses and this is one of many surveys organized during the diving season. For more information visit www.seasearch.org.uk.

The objectives of the Seasearch programme are to:

- Gather information on seabed habitats and associated wildlife throughout Britain and Ireland, by the participation of volunteer SCUBA divers,
- Provide standardized training to enable volunteer divers to participate in Seasearch surveys,
- Ensure the quality of the data gathered,
- Make the data available through websites and reports,
- Raise awareness of the diversity of marine life in Britain and Ireland and its environment through participation of volunteer divers and dissemination of information.

La Société Sercquaise

La Société Sercquaise was founded in 1975 to promote the study of all aspects of Sark's history, to preserve and enhance its cultural heritage and to publish the results. It also supports study of the natural environment together with practical help for island projects.

A Charter of community values has been drawn up and is accessible via a link on the official Sark tourism website www.sark.info

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Marine Conservation Society

The Marine Conservation Society (MCS) is the UK charity dedicated to the protection of the marine environment and its wildlife. Since its formation in 1983, MCS has become a recognized authority on marine and coastal conservation and produces the annual *Good Beach Guide*, as well as promoting public participation in volunteer projects and surveys such as *Adopt-a-Beach*, *Seasearch* and *Basking Shark Watch*.

This Seasearch survey was carried out by members of the MCS as a part of the MCS Member's Dives Programme.

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Table of Contents

Synopsis		5
1	Introduction	
	1.1	Background to the survey 7
	1.2	The survey area 7
2	Methods	
	2.1	Participants 7
	2.2	Organising and undertaking Seasearch dives 8
	2.3	Data analysis and quality control 8
3	General Survey Results	
	3.1	Les Dents 9
	3.2	Gouliot Caves and Havre Gosselin 10
	3.3	Guilliaumesse 12
	3.4	Sardriere 13
	3.5	Pavlaison 14
	3.6	Grune du Nord 15
	3.7	Ecrillais 16
	3.8	Derrible Bay 16
	3.9	Baleine Rock 17
	3.10	L' Étac 18
	3.11	Vingt Clos 19
4	Pink Sea Fan Surveys	21
5	Discussion	
	5.1	Survey scope and limitations 23
	5.2	Range of habitats and biotopes 23
	5.3	Diversity of species 24
6	References	32
7	Acknowledgements	33
Appendix 1	Recording forms	34
Appendix 2	Pink Sea Fan records	41
Appendix 3	Species List	42
Appendix 4	JNCC sublittoral biotopes identified	49
Appendix 5	Dive positions and details	50

Text by Chris Wood. Images by Chris Wood (CW), Sally Sharrock (SS), Fiona Ravenscroft (FR), Mark Warren (MW) and Vicky Cartwright (VC)

Cover image: black faced blenny (SD)

Frontispiece image: three colours of beadlet anemones, Gouliot Caves (SS)

Sketches by Chris Wood (CW), Fiona Ravenscroft (FR), Martin Pratt (MP), Sue Daly (SD), Vicki Billings (VB) & Vicky Cartwright (VC).

Synopsis

This report presents the results of surveys of sublittoral marine habitats and species carried out in Sark in June 2008. The surveys used the Seasearch methodology and were carried out by volunteer divers from the Marine Conservation Society who had been trained in Seasearch Observation and Survey techniques.

A total of 11 sites were surveyed, all accessed by boat. Most of the sites were rocky reefs which were expected to have the greatest diversity of species, but two sediment sites were also visited, primarily to search for eelgrass beds.

At each site records were made of the habitats and species present and these are described on a site by site basis in the report.

In addition to the habitat descriptions JNCC biotopes have been assigned to sites where possible. 11 biotopes were recorded, 5 infralittoral rock biotopes, 4 circalittoral rock biotopes and 2 sublittoral sediment biotopes.

A total of 224 species were recorded, comprising 197 animals and 27 plants. Species which are considered as scarce or rare in UK waters, or which are Biodiversity Action Plan species in the UK include:

branching sponge	<i>Adreus fascicularis</i>
sponge	<i>Axinella damicornis</i>
pink soft coral	<i>Alcyonium hibernicum</i>
pink sea fan	<i>Eunicella verrucosa</i> (BAP)
yellow cluster anemone	<i>Parazoanthus axinellae</i>
southern cup-coral	<i>Caryophyllia inornata</i>
scarlet and gold cup coral	<i>Balanophyllia regia</i>
sunset cup-coral	<i>Leptopsammia pruvoti</i> (BAP)
crawfish or spiny lobster	<i>Palinurus elephas</i> (BAP)
anemone shrimp	<i>Periclimenes sagittifer</i>
sea fan sea slug	<i>Tritonia nilsodhneri</i>
spotted sea slug	<i>Thecacera pennigera</i>
sponge sea slug	<i>Doris sticta</i>
black faced blenny	<i>Tripterygion deleasi</i>

Species recorded which are absent from UK waters are:

burrowing anemone	<i>Pachycerianthus indet.</i>
ormer	<i>Haliotis tuberculata</i>
red starfish	<i>Echinaster sepositus</i>

In addition to the general surveys more detailed records were made of the presence, size, condition and abundance of pink sea fans at all sites where they occurred. The results have been compared against the Seasearch database for pink sea fan records from England, Wales and Ireland and the condition of the Sark population is slightly worse on average than the population as a whole and also worse than previous records in the Channel Islands in 2001-2002. There is no clear reason for this decline and the presence of standing dead colonies (which reduces the overall condition score) may in fact merely reflect stable conditions over a long period.

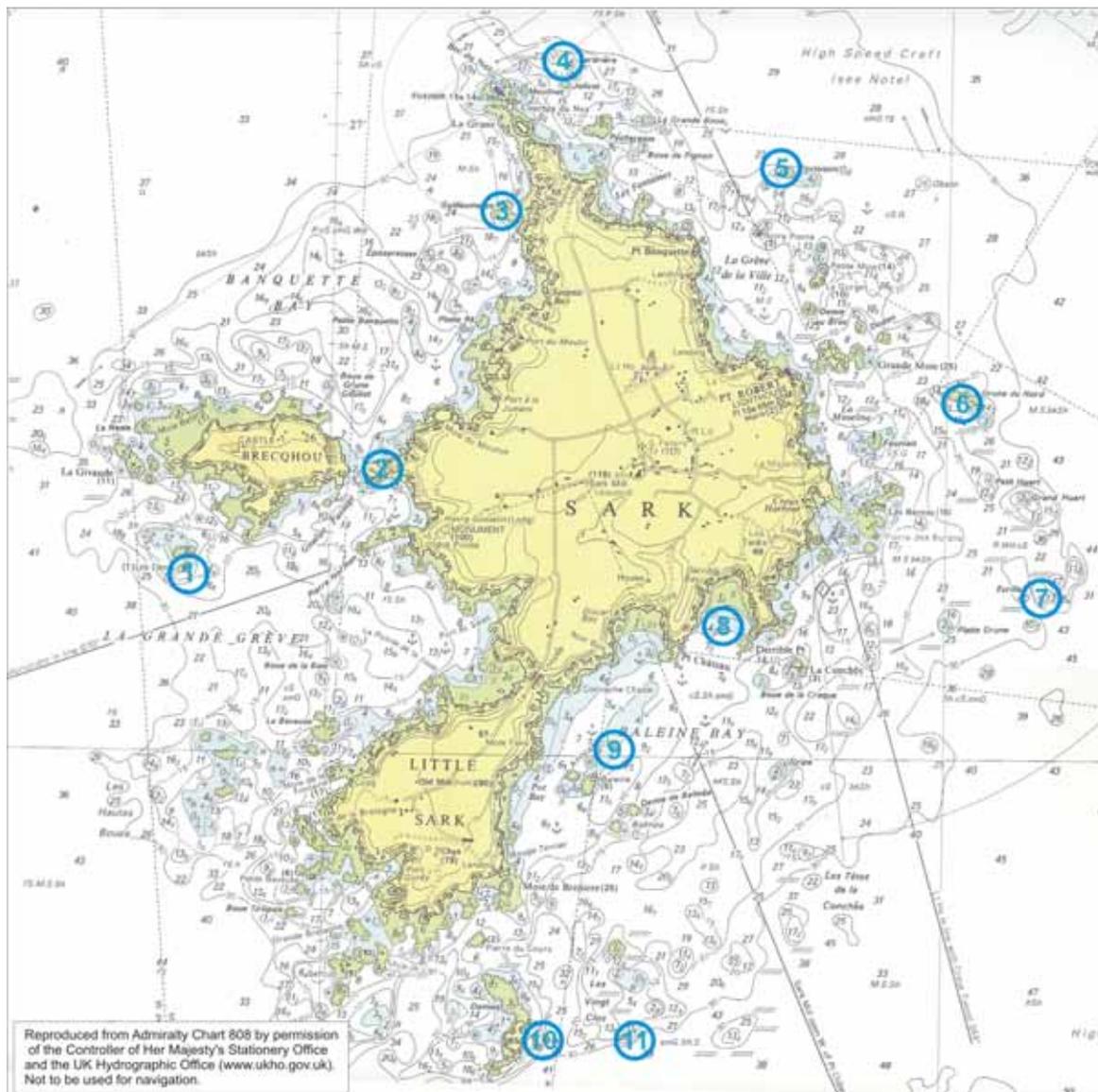


Figure1: Survey Sites

Introduction

1.1 Background to the survey

Previous Seasearch surveys have been carried out on Jersey and Alderney (Wood, 2007, 2008) and pink sea fan records made in Sark and Guernsey (Wood, 2003). Although there have been previous visits to Sark by Marine Conservation Society divers no habitat and species records have been made.

This visit was planned by the Devon Seasearch coordinator, Sally Sharrock, to enable Seasearch divers to experience a different diving area, as only one participant, the author, had dived in Sark before. For this reason we were very glad to have local naturalist, diver and photographer Sue Daly diving with us throughout our week on the island. We also offered to prepare this report for the Société Serquaise and looked at two things they were particularly concerned about, the condition of the pink sea fan population and the presence of eelgrass beds. We gave a talk to the members of the Société whilst we were on the island.

1.2 The Survey Area

Sark is generally considered to be the best of the Channel Islands for underwater scenery and the diversity of the rocky sublittoral habitats and species. The fact that there is deep water on both sides of the island means that sheltered sites are usually available, subject to tidal conditions. As elsewhere in the Channel Islands, the tidal range and the strength of the tidal streams is strong which both has an impact on the diversity of marine life and also makes diving suitable only for experienced divers.

Figure 1 opposite shows the island and its surroundings, and the sites dived during this survey.

Methods

2.1 Participants

The Seasearch survey team consisted of the following:

Sally Sharrock – Devon Seasearch Coordinator and organiser of the survey

Chris Wood – National Seasearch Coordinator

Dr Joanne Porter – University of Wales, Aberystwyth

Vicki Billings – Marine Biologist

All of the above are Seasearch tutors and surveyors

Fiona Ravenscroft – Seasearch Surveyor

Vicky Cartwright – Seasearch Surveyor

Martin Pratt – Seasearch Observer (completed Surveyor qualification during the week)

Mark Warren – Seasearch Observer

Generally the team surveyors collaborated on the production of a single Survey form for each dive, except where they had visited different parts of a site where two forms were completed or where additional forms were completed for training purposes.

In addition to the visiting team, local diver, photographer and naturalist Sue Daly accompanied us throughout the week and gave valuable advice on sites and local species.

All of the participants had underwater cameras and images were used for identification and reporting purposes.

2.2 Organising and undertaking Seasearch dives

All diving was undertaken from Andy Leaman's boat Starfish of Sark. His expertise with sites and tides was essential to the success of the week. Divers worked in buddy pairs and followed normal recreational diving safety procedures.

Information was recorded underwater using a slate and pencil. Data was transferred to either Observation or Survey Forms on the surface. Copies of the two types of form are contained in Appendix 1. The main procedures for Seasearch dive recording are as follows:

- Divers either provide a description of the habitat as a whole using a sketch and tick boxes (Observation Form), or divide the site into separate habitats and provide a description and qualitative information about seabed composition and features (Survey Form)
- Species are recorded either in a single list using a simplified COR (common-occasional-rare) scale (Observation Form) or recorded in separate lists for each habitat using the SACFOR (Superabundant-abundant-common-frequent-occasional-rare) scale (Survey Form).
- Positions for each dive were recorded by GPS and dive times recorded. Depths were recorded by surveyors using dive computers, which also provided minimum temperature information.
- During the compilation of the Survey forms extensive use was been made of images taken on the dives using digital cameras, and identifications have been checked in keys and identification guides.
- After the survey all depths have been adjusted to chart datum, JNCC biotopes identified for the Survey forms and all of the data has been entered into the Marine Recorder database.

2.3 Data analysis and quality control

Where possible experienced surveyors were paired with those with less experience. This provides a good level of accuracy with both habitat descriptions and species names. Apart from bryozoans, no specimens were collected and identifications were made *in situ*, backed up with photographs. Some life cannot be reliably identified to species level *in situ* and smaller species, including in fauna and crevice dwellers are generally under recorded in visual surveys. Identification guides were available on site to check identifications and all forms were completed the same day whilst fresh in people's minds.

Scientific names generally follow the nomenclature of the MCS Species Directory (Howson & Picton, 1997), however in some cases this is now out of date and the most recent authoritative name has been used. Common names have been included in the report where they exist to aid accessibility and follow the names in the Seasearch Observer's Guide to Marine Life (Wood, 2007).

The data on the recording forms has been subsequently validated and entered into the Marine Recorder database by the author. JNCC biotopes have been assigned to each habitat on the Survey forms as a part of this process.

3.00 General Survey Results

This section summarises the results of the general habitat and species records made on the Survey and Observation forms. A summary description of each site dived is included in this section with representative sketches drawn by divers and images of significant species and habitats where appropriate.

General locations of the dive sites are shown in Figure 1. Species lists for each site with abundances are included in Appendix 3 and tables giving details of dive site positions and other data about the dive are given in Appendix 4. The original 'raw' data forms are held by the Marine Conservation Society.

Site 1 Les Dents

(49° 25.530'N 002° 23.715'W)

Surveyed 23/06/08 by whole team. 2 Survey Forms completed by Vicky Cartwright and Martin Pratt.

Physical Environment

Les Dents are a series of rocks and shallow reef lying south-west of Brecqhou. The dive was undertaken on the exposed southern side of the reef where the rock shelves gradually to 10m and then steeply to 17m followed by a flattish boulder slope. The site is moderately wave exposed and has moderate tidal streams.

Habitat/Community Types

The upward facing surfaces down to 10m are dominated by kelp forest or kelp park, with a mixture of cuvie, *Laminaria hyperborea* and golden kelp, *Laminaria ochroleuca*. There is an understory of sponges, sea squirts and red and smaller brown seaweeds.

The steeply sloping and vertical wall facing southwards was dominated by sponges (16 species recorded) with hydroids, spiral bryozoans, orange sea squirts, jewel anemones and red fingers, *Alcyonium glomeratum*, all common. There were a significant number of pink sea fans, *Eunicella verrucosa*, including a number of standing dead colonies.

The lower upward-facing surfaces below the wall had a similar but less dense and diverse fauna to the wall. However the potato crisp bryozoan, *Pentapora foliacea*, was common.

Observations/Features of interest

The site was notable for the diversity of sponges with 17 species recorded, many of which were common. Other species which are scarce or rare in the British Isles included yellow cluster anemones, *Parazoanthus axinellae*, scarlet and gold star coral, *Balanophyllia regia*, the nudibranch *Thecacera pennigera*, and the marbled electric ray, *Torpedo mamorata*. Typically Channel Islands species included golden kelp, *Laminaria ochroleuca*, the black faced blenny, *Tripterygion delesi* and red fingers *Alcyonium glomeratum*.

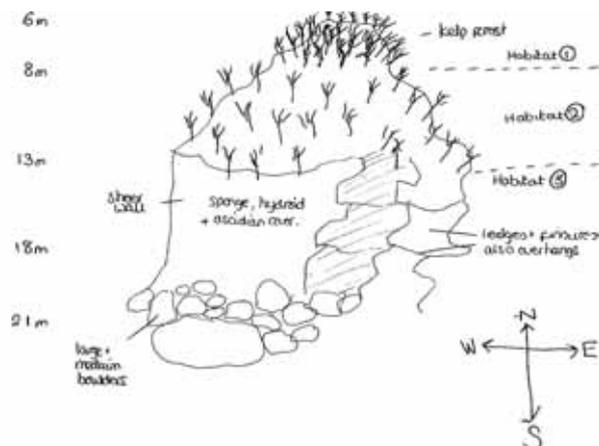


Figure 2: Sketch of habitats at Les Dents (VC)

Concern had been expressed to us about the state of the pink sea fan population at this site. This is covered later in Section 4.

Site 2: Gouliot Caves

(49° 25.912'N 002° 22.737'W)

Surveyed 24/06/08 by whole team. 1 Survey Form completed by Martin Pratt

Physical Environment

The Gouliot Caves are a littoral and sublittoral fringe cave system running through the Moie de Gouliot headland opposite Brecqhou. There are accelerated tidal streams through the Gouliot Passage and therefore strong tidal currents through the caves. The site was dived from the north side to the south at slack water, emerging in Havre Gosselin on the south side of the headland. The maximum depth in the caves at the time of the dive was 5m which corrects to 0m below chart datum. The upper parts of the cave are regularly exposed, however the area dived is completely covered by water on all but the very lowest spring tides.

The northern entrance leads to a completely submerged and enclosed cave which is totally dark. In the centre of the cave system there is a blind cave to the north-east which leads above the surface and an open area with patches of light from cracks above. The cave is about 5m wide at this point. To the south it narrows again but there is some light from above. Figure 3 is a sketch of the sublittoral sections of the cave. The walls and cave roof are of rock whilst the cave floor is of cobbles and pebbles.

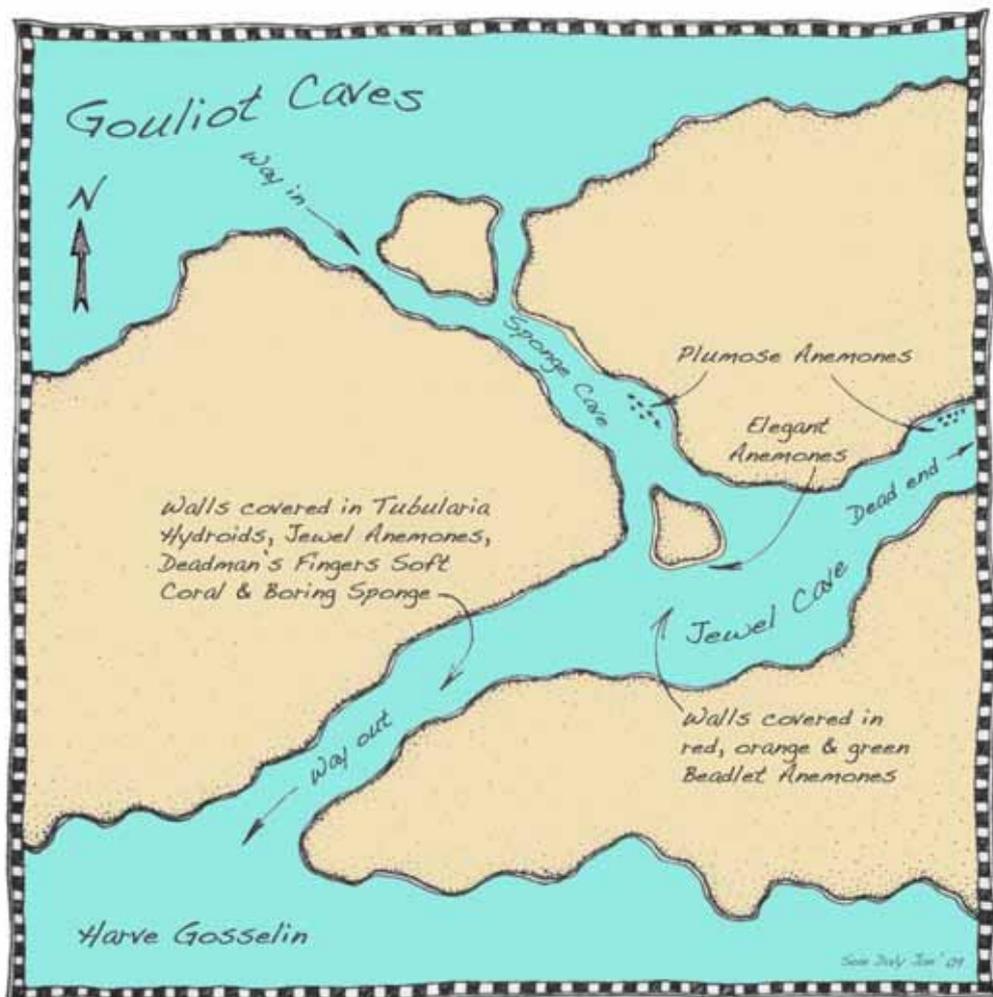


Figure 3: Sketch map of Gouliot Caves (SD)

Habitat/Community Types

Because of the darkness within the caves the marine life was totally animal based and there were no seaweeds. Instead the walls were dominated by filter feeding anemones and hydroids. In the lighter central part of the cave there was a dense mix of beadlet anemones, *Actinia equina*, and fine short hydroids, *Obelia* sp, more commonly encountered on kelp blades (Figure 4). In slightly darker patches, but still with a little light there were areas of plumose anemones, *Metridium senile*, elegant anemones, *Sagartia elegans*, jewel anemones *Corynactis viridis*, and both species of oaten pipe hydroids, *Tubularia indivisa* and *T. larynx*.

The darkest, northern, cave is known as the sponge cave and contains a number of sponge species, including blanchet elephant hide sponge, *Pachymatisma johnstonia*, which is normally grey. There were no branching sponges present due to the strong tidal streams.

This cave habitat is extremely unusual, if not unique. Most shallow caves are more wave and surge exposed and consequently have less diversity of life. Perhaps the closest example is the Sugar Loaf Caves on the Isle of Man, but these have less tidal current running through them and the mix of species is quite different.

Observations/Features of Interest

None of the species present in the caves are rare or do not have a widespread distribution. What makes the Gouliot caves unusual is the sheer density of hydroids and anemones, made possible by the tidal streams bringing copious amounts of food with each change in the tide.



Figure 4: Beadlet anemones and hydroids in the light section of Gouliot Caves (VC)

Site 2A: Havre Gosselin

(49° 25.875'N 002° 22.680'W)

Surveyed briefly 24/06/08 by the whole team. 1 Observation form completed by Chris Wood.

Physical Environment

Outside the southern exit from the Gouliot caves the northern part of Havre Gosselin consists of undulating shallow rocky reefs not more than 2m below chart datum (7.5m depth at the time of the survey).

Habitat/Community Types

The deeper parts of the rocky substratum had a mixed kelp forest of cuvie, *Laminaria hyperborea*, and golden kelp, *L. ochroleuca*, whilst the shallow tops of ridges and small pinnacles had stands of thongweed, *Himanthalia elongata*. The harpoon weed, *Asparagopsis armata*, was common in the algal dominated understory.

Observations/Features of Interest

This shallow and relatively sheltered site was quite different to the deeper, offshore reefs which were the subject of most of the dives.

Site 3: Guillaumesse

(49° 43.757'N 002° 09.728'W)

Surveyed 22/06/08 and 26/06/08 by whole team. 2 Survey Forms completed by Chris Wood and Martin Pratt.

Physical Environment

Guillaumesse is rock which reaches the surface on the north-west side of Sark. The outer, western, face of the rock drops steeply initially and then continues as a slope of huge boulders. The seabed levels somewhat at 15m bcd and continues as a gentle slope of mixed sized boulders (Figure 5). The inner side of the rock is much shallower.

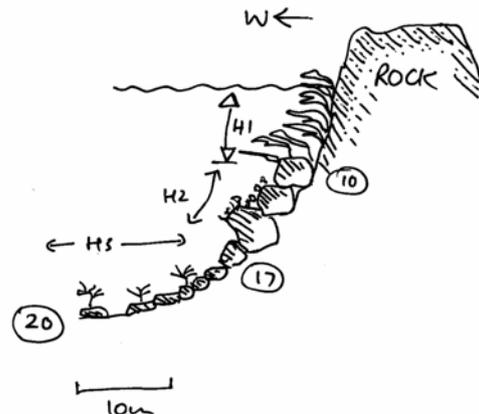


Figure 5: West side of Guillaumesse (CW)

Habitat/Community Types

The upper section of the west facing wall and all of the sheltered east side of the rock were dominated by a mixed kelp forest of cuvie, *Laminaria hyperborea*, and golden kelp, *L. ochroleuca*. Beneath the canopy and on the vertical and overhanging faces was a mixed turf of bryozoans (*Bugula* and *Crisia* spp.), and jewel anemones.

On the larger boulders a little deeper kelp became sparse and there was a more diverse range of red seaweeds and animal species including sponges (9 species), bryozoans (*Bugula* and *Alcyonidium*), sea squirts (*Morchellium* and *Stolonica*), and jewel anemones and red fingers, *Alcyonium glomeratum*.

On the lower boulders (14-17m bcd) there were no seaweeds and the animal turf was dominated by spiral bryozoans (*Bugula* spp.) and four-spot sea squirts, *Morchellium argus*, with a range of erect sponges, red fingers and pink sea fans.

Observations/Features of Interest

This was the most diverse site visited during this survey with 95 species of plants and animals recorded. Species which are scarce or rare in the UK included the pink soft coral, *Alcyonium hibernicum* in underhangs near the surface, yellow cluster anemones, *Parazoanthus axinellae*, in an unusually shallow location, the southerly sponges *Adreus fascicularis* and *Axinella damicornis*, and the scarlet and gold cup-coral *Balanophyllia regia*. Typical Channel Island species were golden kelp and the black faced blenny.

Two particularly interesting species were a large tube anemone *Pachycerianthus* sp. (Figure 6) and a large sabellid worm (Figure 7), both seen in the boulder habitat.

The anemone is a known but possibly undescribed species of *Pachycerianthus*. The UK species, *Pachycerianthus multiplicatus*, is similar but is only found in soft mud, normally in Scottish sea lochs. There is another species, *Pachycerianthus membranaceus*, in the Mediterranean. This species has been recorded previously from the Channel Islands (Jersey) and the Brittany coast but it is not clear if it is either of the above or a separate species. It is rarely recorded (Daly, 1998 & Wood, 2005).

The large sabellid worm was larger than the commonly recorded *Sabella pavonina* and may be *Sabella spanzanini*.



Figure 7 (above): Unidentified sabellid worm (MW)

Figure 6 (left): *Pachycerianthus* sp. (VC)

Site 4: Sardriere

(49° 27.230'N 002° 21.850'W)

Surveyed 26/06/08 by whole team. 1 Survey Form completed by Vicki Billings

Physical Environment

A moderately exposed, tide-swept site with steep rocky reef from 0m bcd to 18.5m bcd leading to a gently sloping sea bed of rock and boulders with areas of fine sand and shelly gravel.

Habitat/Community Types

Mixed kelp forest of curvies, *Laminaria hyperborea*, and golden kelp, *L. ochroleuca*, on upward facing surfaces to 10m bcd. Vertical walls with mixed faunal turf of jewel anemones, *Corynactis viridis*, red seaweeds, sponges and bryozoans.

The lower boulder seabed with sediment was the most diverse area, though no single group predominated. On the boulders sponges, hydroids, anemones and sea squirts were frequent with both pink sea fans, *Eunicella verrucosa*, and potato crisp bryozoan, *Pentapora foliacea* amongst the larger life forms.

Observations/Features of Interest

A large crawfish, *Palinurus elephas*, was recorded. This is a Biodiversity Action Plan species in the UK because of the small numbers remaining. It was the only one recorded during this survey and is rarely seen in the Channel Islands (Daly, 1998).

Also seen was a sunfish, *Mola mola*. This is an oceanic fish which is not often found in coastal waters.

Site 5: Pavlaison

(49° 26.854'N 002° 20.806'W)

Surveyed 25/06/08 and 27/06/08 by whole team. 2 Survey Forms completed by Fiona Ravenscroft and Sally Sharrock.

Physical Environment

Pavlaison is a horseshoe shaped reef north-east of Sark. It is moderately sheltered and subject to fairly strong tidal streams. Both of the surveys here were on the southerly side of the reef where the various tops of different outcrops varied from 1.5m bcd to 9m. There were a series of stepped walls and shelves to the base of the rock at 17m bcd. Below this there was a seabed of gently sloping boulders and then a flattish plain of shell gravel gradually deepening to 20m bcd away from the reef.

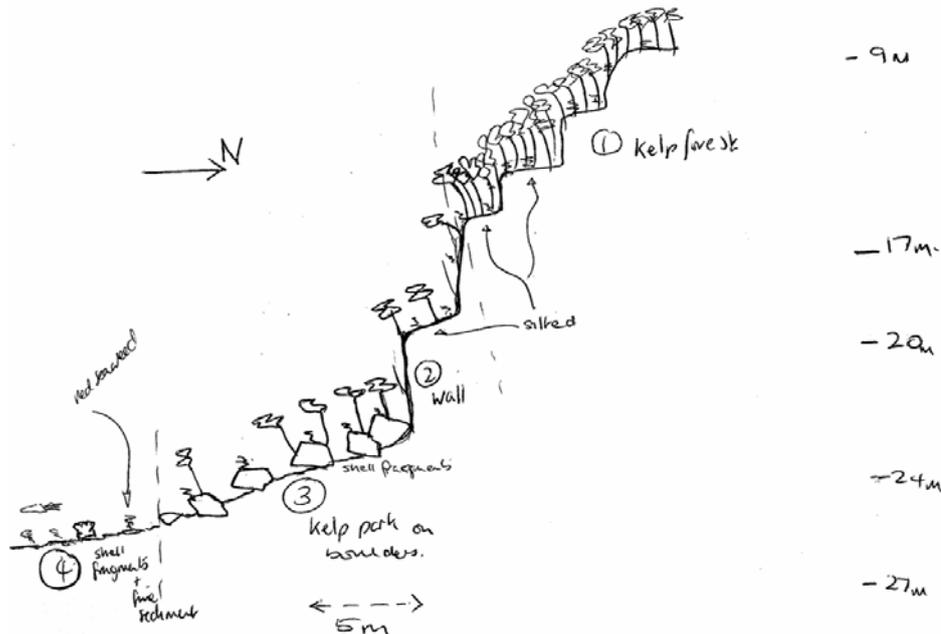


Figure 8: Sketch of survey area at Pavlaison (FR)

Habitat/Community Types

The upper parts of the reef, both upward facing and sloping surfaces, were dominated by a mixed kelp forest of curvie, *Laminaria hyperborea*, and golden kelp, *L. ochroleuca*. Beneath the kelp there was a mixed turf of red seaweeds, sponges, jewel anemones, hydroids and bryozoans.

The rock walls and ledges forming the side of the reef had a light silt cover, especially on the ledges, and this supported a wide range of sponges. Other common species were jewel anemones, *Corynactis viridis*, red fingers, *Alcyonium glomeratum*, and hydroids and bryozoans. Kelp park was found both on the ledges and on the boulders at the base of the slope.

The shell gravel away from the reef was tide-swept and contained some scallops, but little other visible in fauna. There were a few small scoured boulders with orange sea squirts, *Stolonica socialis*, and encrusting bryozoans.

Observations/Features of Interest

This was the second most diverse of the sites surveyed, though this may reflect the fact that two dives were undertaken. The site had the highest number of bryozoans recorded (25 species) and equal highest number of sponges (18 species). Rare or scarce species were pink soft coral, *Alcyonium hibernicum*, imperial anemone, *Aureliania heterocera*, yellow cluster anemones, *Parazoanthus axinellae*, and the sponge sea slug, *Doris sticta*.

Site 6: Grune du Nord

(49° 26.190'N 002° 19.871'W)

Surveyed 23/06/08 by whole team. 1 Survey Form completed by Sally Sharrock.

Physical Environment

Grune du Nord is a similarly sized area of reef to Pavlaison and lies further to the south-east off Point Robert. The highest point of the reef breaks surface at extreme low water and there are steep rock walls to 18m bcd with gullies between them. At the base of the walls were large boulders interspersed with patches of gravel, cobbles and pebbles.

Habitat/Community Types

The upper sides of the rocky walls were dominated by kelp forest thinning out to kelp park at about 15m bcd. Unlike most other sites around Sark here the kelp was all cuvie, *Laminaria hyperborea*, and not the mixed kelp found elsewhere. There was a similar turf of hydroids and bryozoans with a variety of sponges below the kelp. The walls below the kelp had a rich animal turf also dominated by sponges, hydroids and bryozoans. Unlike Pavlaison, there were some narrow gullies where there will be accelerated tidal streams but shelter from wave surge. One of these contained a number of large pink sea fans (Figure 9).



Figure 9: Pink sea fan in a gully (CW)

The lower parts of the walls and the boulders at the base of the reef had a typically Channel Islands 'yellow reef' appearance with numerous yellow and orange sponges, including the hedgehog sponge, *Polymastia boletiformis*, yellow staghorn sponge, *Axinella dissimilis*, *Axinella damicornis* and boring sponge, *Cliona celata*. Orange sea squirts, *Stolonica socialis* were also frequent (Figure 10).



Figure 10: 'yellow reef' of sponges and sea squirts (CW)

Observations/Features of Interest

Species recorded which are rare or scarce in the UK, but somewhat less so in the Channel Islands included sponges *Axinella damicornis* and *Adreus fascicularis*, and the yellow cluster anemone, *Parazoanthus axinellae*. The sponge *Leuconia gossei*, which is an uncommon south-westerly species in the British Isles, was also recorded. This was only seen in Sark here and at the nearby Ecrillais.

Site 7: Ecrillais

(49° 25.514'N 002° 19.508'W)

Surveyed 25/08/07 by whole team. 1 Survey Form completed by Chris Wood

Physical Environment

Ecrillais was the most tide swept site visited during this survey lying well off the east side of Sark in an area marked on the chart with overfalls. The physical features were somewhat similar to Pavlaison with the top of the reef at about 9m bcd and a series of walls and ledges on the exposed south-western side. The surrounding seabed is, however deeper here and had not been reached at 40m, the deepest we could see below us.

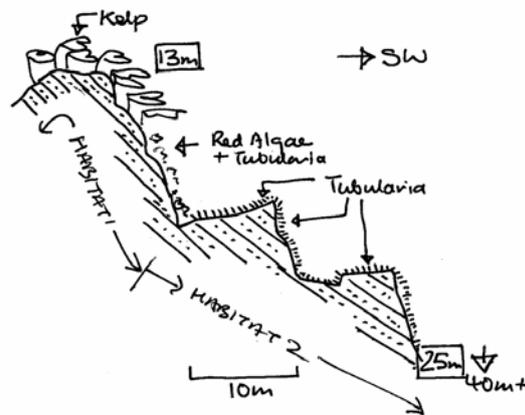


Figure 11: Profile of reef at Ecrillais (CW)

Habitat/Community Types

The top of the reef had a similar mixed kelp forest and park community with similar amounts of curvie, *Laminaria hyperborea*, and golden kelp, *L. ochroleuca*. Beneath the kelp there was a red seaweed dominated turf. From 11m down, both horizontal and vertical surfaces were dominated by oaten pipe hydroids, *Tubularia indivisa* (superabundant) with jewel anemones, *Corynactis viridis* (abundant) and elegant anemones, *Sagartia elegans* (common).

Observations/Features of Interest

The only other site where there were large numbers of oaten pipe hydroids and elegant anemones was the Gouliot caves, another strongly tide-swept environment, but one with totally different physical features. Ecrillais was strikingly different to the other offshore rocky pinnacles surveyed in Sark, with no silt and a densely packed but much less diverse fauna.

Site 8: Derrible Bay

(49° 25.000'N 002° 21.175'W)

Surveyed 27/06/08, 1 Observation Form completed by Chris Wood

Physical Environment

Derrible Bay is a sheltered, southward facing bay on the east side of Sark and is an established mooring area. There is a rocky foreshore around most of the bay with boulders and pebbles in the shallow sublittoral. The centre of the bay is sand.

Habitat/Community Types

The shallow boulders were dominated by seaweeds with tall stands of thongweed, *Himanthalia elongata*, in the shallows and a golden kelp forest a little deeper. The pebbles beyond the boulders had stands of the invasive japweed, *Sargassum muticum* and the red seaweed understory had large amounts of the harpoon weed, *Asparagopsis armata* amongst it.

The centre of the bay appeared to consist of fine barren sand.

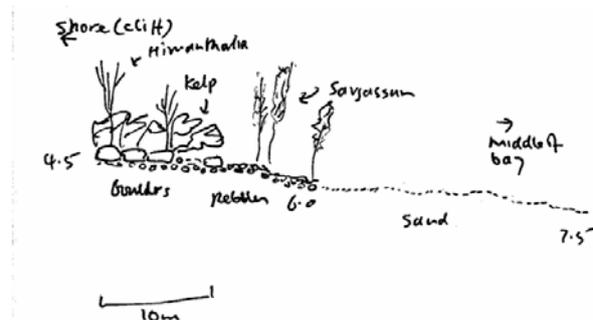


Figure 12: Shallow habitats in Derrible Bay (CW)

Observations/Features of Interest

One reason for visiting this site was to look for eelgrass, which we were told was present here. However none was found. The occasional snakelocks anemones, *Anemonia viridis*, around the margin of the boulders and on the pebbles often had anemone prawns, *Periclimenes sagittifer* present (Figure 13). These bright little prawns have been at the northerly extent of their range in the Channel Islands until recently. However a population appears to have been established in Swanage, Dorset since 2007 and is being studied by Seasearch volunteers.



Figure 13: Anemone prawn, *Periclimenes sagittifer*

Site 9: North of Baleine Rock

(49° 253.000'N 002° 21.700'W) surveyed 27/06/08 by Chris Wood and Sue Daly. 1 Survey Form completed by Chris Wood

Physical Environment

Two separate dives were undertaken in a relatively sheltered area to the north and north east of Baleine Rock primarily to look for eelgrass beds. The seabed consisted of flat rippled sand at a depth of 3.5 – 5.5m bcd. A significant current was running.

Habitat/Community Types

The sand was mobile and largely barren with a few burrowing anemones, *Cerianthus lloydii*, and sand mason worms, *Lanice conchilega*. There were a few dragonets on the surface. Occasional pebbles provided a holdfast for japweed, *Sargassum muticum*. Occasional eelgrass plants, *Zostera marina*, were present but numbers were few and there was nothing approaching an eelgrass bed. Eelgrass is frequently a threatened habitat by anchoring or less often trawling and is a UK Biodiversity Action Plan habitat for this reason.

Observations/Features of Interest

It is not clear if the eelgrass that was formerly known to occur in this area has disappeared or if our two dives here did not find it.

Site 10: L' Étac

(49° 24.096'N 002° 21.969'W)

Surveyed 24/06/08 by whole team. 1 Survey Form completed by Vicki Billings

Physical Environment

The area dived was on the east side L' Étac islet close to the rocky shoreline. There were sloping rock surfaces to a depth of about 7m bcd (15m at the time of the dive). These included both flattish surfaces and low walls and gullies. Below 7m bcd there were two different habitats, one a steeply sloping surface of pebbles, cobbles and small boulders and the other a vertical wall with overhangs and fissures to a depth of at least 25m bcd.

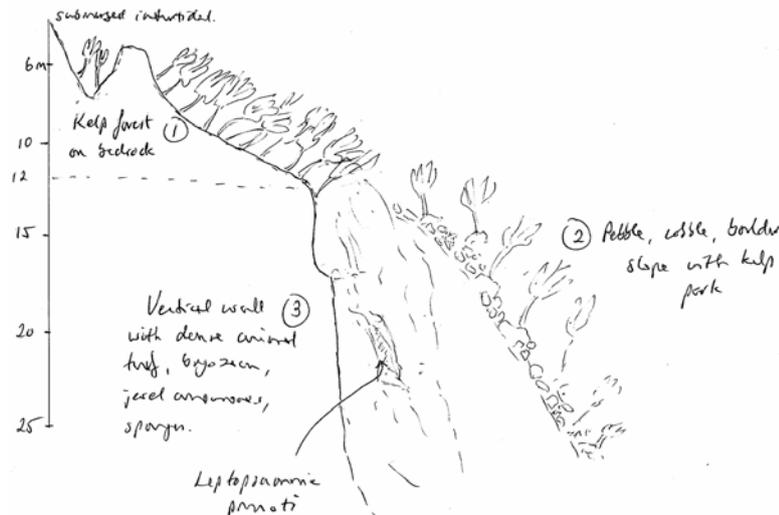


Figure 14: Profile at L' Étac - east side (VB)

Habitat/Community Types

As the dive was undertaken at high water (8m above chart datum) there was a submerged intertidal area present with rocky surfaces covered in barnacles and short green and red algae.

The shallow sublittoral areas were dominated by a kelp forest, largely of cuvie, *Laminaria hyperborea*. The kelp stipes were covered in red seaweeds and there were anemones (white striped anemones, *Actinothoe sphyrodeta*, and jewel anemones, *Corynactis viridis*) and low growing sponges on the rock beneath.

The steep slope of pebbles, cobbles and small boulders was also dominated by seaweeds with a kelp park of mixed cuvie and golden kelp, together with other brown seaweeds such as pod weed, *Halidrys siliquosa*, and brown fan weed, *Dictyota dichotoma*.

The wall was densely covered in a diverse animal turf containing bryozoans, hydroids, jewel anemones, sea squirts and sponges.

Observations/ Features of Interest

Two rare cup-coral were present on the wall, sunset cup-corals, *Leptopsammia pruvoti*, and southern cup-corals, *Caryophyllia inornata*, as well as the much more widespread Devonshire cup-coral, *Caryophyllia smithii*. Both of the rare cup-corals have a southerly distribution in the British Isles and the sunset cup-coral is only recorded from four other areas, Lundy, Isles of Scilly, Plymouth and Lyme Bay. It is a Biodiversity Action Plan species in the UK.

Other uncommon species included the sponge, *Adreus fascicularis*, yellow cluster anemones, *Parazoanthus axinellae* and pink sea fans, *Eunicella verrucosa*. All of these have a restricted southerly distribution in the British Isles.

Site 11: Vingt Clos

(49° 24.110'N 002° 21.500'W)

Surveyed 22/06/08 by whole team. 3 Survey Forms completed by Fiona Ravenscroft, Martin Pratt and Vicki Billings

Physical Environment

Vingt Clos is a moderately exposed area of reefs south-east of Little Sark. It is subject to strong tidal streams and there are overfalls marked on the chart. The area dived was on the south easterly side of the reef where it drops away into deeper water. Starting from the same position sets of divers went in two different directions, encountering different habitats (Figure 15).

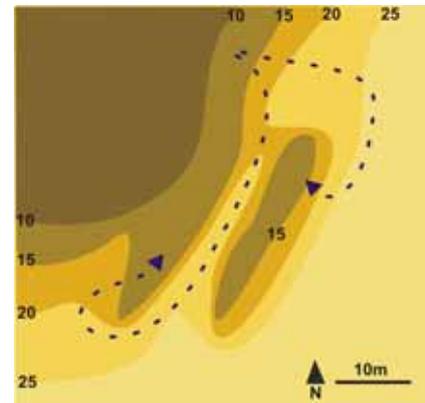


Figure 15: Vingt Clos plan (CW)

Habitat/Community Types

The shallow reef top was dominated by a mixed kelp forest of both local species; curvie, *Laminaria hyperborea*, and golden kelp, *L. ochroleuca*. There was an understory characterised by jewel anemones and oaten-pipe hydroids as would be expected in such a tide-swept area.

Moving east (Figure 16) there was a steeply sloping wall from 13m bcd to 19m bcd. This had a mixed faunal turf of jewel anemones (abundant), bryozoans (*Alcyonidium diaphanum* and *Bugula plumosa* abundant and common respectively) and a variety of sponges of which the purse sponge *Scypha ciliata* and spiky lace sponge *Leucosolenia* sp. were both common. At the base of the wall 18-20m bcd was a flatter rocky area with scattered kelp plants and a turf of orange sea



Figure 16: Profile of east side of Vingt Clos (VB)

squirts, *Stolonica socialis*, and sponges beneath.

Moving to the south from the entry point the divers entered a deep gulley, with 10m tall walls on either side and dominated by jewel anemones with smaller amounts of sponges, hydroids and bryozoans (Figure 17). The base of the gulley was initially made up of pebbles but further to the south deepened slightly and became boulders with a mixture of jewel anemones and red seaweeds covering them. At the southern end of the gulley (21m bcd) the gulley opened out into gently sloping boulder and pebble seabed.

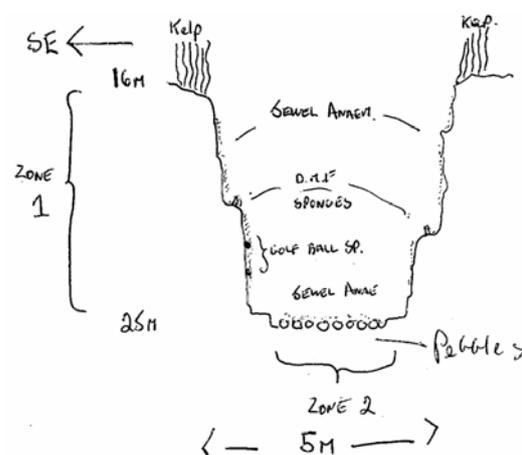


Figure 17: Cross-section through gulley at Vingt Clos (MP)

Observations/Features of Interest

This is a tide-swept site with a good diversity of sessile fauna of which the abundance of jewel anemones was the most notable feature. These were present in all of the habitats at high abundances, including on the lower boulder surfaces at the base of the walls and gullies. This is an unusual habitat for this species which normally prefers shaded surfaces. There were no species here which were not recorded elsewhere

4 Pink Sea Fan Surveys

Records of size, condition and other characteristics of sea fans, *Eunicella verrucosa*, were made at 7 sites, all of these where they were recorded. At each site between 1 and 40 pink sea fans were recorded on the forms in Appendix 1. A total of 124 colonies were surveyed in this way.

The data collected is shown in Appendix 2 and can be compared with other recent sea fan data from England, Wales and Ireland (Wood, 2008) and also with earlier data from Sark and elsewhere in the Channel Islands collected in 2001 and 2002 (Wood, 2003).

The following conclusions may be made from the data:

Size: Sea fans in Sark are, on average, bigger than in England, Wales and Ireland (2004-2006 dataset), (mean width 25.3cm, height 24.9cm compared to w 21.5cm h 21.6cm) and are similar to the 2001-2 records for the Channel Islands as a whole. There are a good range of colony sizes with a number of small colonies which shows recent recruitment.

Depth range: The shallowest fan recorded was at Gulliaumesse where the recorded depth of 6.2m translates to 0.2m below chart datum. That is significantly the shallowest sea fan throughout our database. It suggests that wave exposure is not high at this site as such a shallow sea fan would be unlikely to survive rough winter conditions. There is a significant level of siltation here which also suggests a less wave exposed and tide swept situation than elsewhere. The deepest sea fans recorded in this survey were 23m below chart datum which is by no means the deepest limit for sea fans. In our dataset they have been observed as deep as 75m.

Abundance: Sea fans in Sark were recorded as common only at Sardriere, and were occasional or rare elsewhere. There do not appear to be any of the extensive sea fan 'forests' in Sark that we have observed off Plymouth and the Manacles in Cornwall. It may be that the tidal streams around Sark are too strong for optimal sea fan growth.

Colour: 94.6% of the living seafans recorded in Sark were pink in colour. Three white colonies were recorded at two different sites. The low percentage of white colonies is consistent with records from elsewhere except for the Isles of Scilly where 18% were white (2004-6 dataset).

Condition: One of the reasons for looking closely at pink sea fans during this survey was concern from the local divers at the condition of the population, particularly at Les Dents. The mean condition is derived from a scale applied to each sea fan in which 5 is a perfect specimen with no fouling or obvious missing areas (Figure 18), whilst a standing dead sea fan has a score of 0 (Figure 19). The mean condition of the sea fans at each site in Sark varied from



Figure 18: Healthy pink sea fan at Les Dents (CW)

3.22 at Pavlaison to 4.18 at Sardriere (omitting the single perfect specimen seen at Vingt Clos). The mean figure for Sark is 3.85. This is lower than for the 2004-6 dataset where the mean figure for England, Wales and Ireland was 4.00. It is also significantly less than the 2001-2 figure for the Channel Islands of 4.57. 11 standing dead sea fan colonies were recorded (8.9%), with the largest number at Les Dents.

Sea fan populations have been the subject of two main forms of damage in recent years, physical damage from fishing gear and death *in situ* from a viral disease. Physical damage can be from trawling, netting, potting or tangled lines and leads to broken colonies in the short term and complete removal from site in the longer term. Since there were a significant number of standing dead colonies present in Sark it is unlikely that physical damage has been an issue. The viral disease leads to loss of living tissue and a 'wasted' appearance to the colony with spindly branches and few polyps. Only one colony was seen with this appearance (at Les Dents) and it seems unlikely that it is a widespread problem. Elsewhere where we have observed it, such as at Lundy, the disease has a widespread impact and most colonies in the area are affected.



Figure 19: Standing dead sea fan at les Dents with a variety of fouling organisms (CW)

The standing dead colonies may not be anything more than the reflection of a mature population and stable conditions over time. Colonies may have died as a result of over-maturity, but remain standing because there is nothing to cause them to break off. The skeleton becomes fouled by a variety of filter feeding organisms which benefit from being elevated above the seabed and can stay there in that state for many years. Similar situations have been observed with mature populations in the Manacles and elsewhere.

Whilst the population should continue to be monitored, the results do not suggest there is a major problem, and in any event there is no action that can be taken if the viral disease occurs.

Sea fan sea slugs: *Tritonia nilsodhneri* is a small sea slug which is an obligate feeder on pink sea fan polyps. Either eggs or adults were seen on about 10% of the colonies in Sark. This is less than the 15% recorded for the Channel Islands in 2001-2 but the 2004-6 dataset showed big changes in numbers from year to year throughout its range and generally much reduced numbers over the 2001-2 data overall. There have been no records of the sea fan anemone, *Amphianthus dohrnii*, from the Channel Islands.

5 Discussion

5.1 Survey scope and limitations

The sites sampled during the survey were determined by tides and weather conditions as well as the interests of the divers taking part. Since this was a volunteer survey, the sites visited were those most attractive to biologically interested divers and thus there was a preponderance of rocky pinnacles which generally have the best underwater scenery and diversity.

Inshore and shallow water sites were less well sampled with only the Gouliot Caves looked at in any detail and very limited records from Havre Gosselin and Derrible Bay. Surveys of a wider range of shallow water sites in the future would undoubtedly increase the range of habitats and species observed. Seaweeds are particularly under-represented in this survey.

5.2 Range of habitats and biotopes

JNCC biotopes have been identified for the sites from which Survey Forms were received. The JNCC biotope suite was not designed to include the Channel Islands and infralittoral rock biotopes containing *Laminaria ochroleuca* kelp forest or park are not very well catered for. We are also at a relatively early stage in assessing biotopes for Seasearch surveys and as a result some of the biotopes identified must be considered as preliminary.

The List of biotopes identified is shown in Appendix 4. Eleven different biotopes are identified of which 5 are infralittoral rock biotopes, 4 circalittoral rock biotopes and 2 sublittoral sediment biotopes. It is not surprising, in view of the tidal streams, that all of the circalittoral biotopes come within the high energy classification.

Of the infralittoral rock biotopes IR.HIR.KFaR.LhypR.Loch Mixed *Laminaria hyperborea* and *Laminaria ochroleuca* forest on exposed infralittoral rock, was widespread. Of the circalittoral rock biotopes CR.HCR.XFa.SpAnVt sponges and anemones on vertical circalittoral bedrock, (Figure 20) featured strongly.

A number of habitats described could not be assigned biotopes as nothing in the JNCC biotope classification appeared to adequately cover them. These included sloping pebbles (L'Étac), pebbles and boulders in a gully bottom dominated by jewel anemones (Vingt Clos) and *Laminaria ochroleuca* park with *Stolonica socialis* on bedrock (Vingt Clos). The single caves and surge gullies biotope available also does not adequately cover the range of biotopes found at the Gouliot Caves.



Figure 20: Biotope CR.HCR.XFa.SpAnVt Sponges and anemones on vertical circalittoral bedrock, Vingt Clos (SS)

5.3 Diversity of species

Appendix 3 contains a list of all of the species recorded and the sites at which each species was present. It also shows the abundance for each record. In some cases there is more than one abundance score for a species. This is because separate habitats are recorded any and species may occur in more than one. Abundances use the SACFOR scale (superabundant-abundant-common-frequent-occasional-rare). An abbreviated abundance scale is used for Observation forms - COR (common-occasional-rare). In cases where species were subsequently identified from photographs, or where the recorder was uncertain, P for present is substituted for the abundance scale.

A total of 224 species is recorded for the survey as a whole comprising 197 animals and 27 plants in the following groups:

Sponges	Porifera	36
Jellyfish, hydroids, anemones and corals	Cnidaria	34
Flatworms	Platyhelminthes	1
Segmented worms	Anellida	10
Sea spiders	Chelicerata	1
Barnacles, crabs, prawns and lobsters	Crustacea	13
Shells, bivalves and sea slugs	Mollusca	22
Sea mats and sea mosses	Bryozoa	47
Starfish, sea urchins and sea cucumbers	Echinodermata	8
Sea squirts	Tunicata	9
Fishes	Pisces	16
Red seaweeds	Rhodophycota	11
Brown seaweeds	Phaeophyceae	12
Green seaweeds	Chlorophyceae	3
Flowering plants	Angiospermae	1

The total number of species for each site shown in Appendix 2 must be taken as a guideline only as number of species recorded is highly dependent on the intensity of recording, which varied considerably. The sites with the greatest diversity of plants and animals recorded were Guillaumesse (95) and Pavlaison (94), both of which were visited twice by the whole team. Other very diverse sites were Les Dents (83), Vingt Clos (80) and Grune du Nord (75). Of the three least diverse sites, Derrible Bay (20) and Havre Gosselin (13) only received limited surveys though the lowest site diversity was at Baleine Rock (6) which adequately reflects this highly unstable, tide-swept sediment site.

Other sites which do not stand out in terms of diversity may be notable for the high density of a smaller range of species. This applies particularly to the anemones in the Gouliot Caves and to the oaten pipe hydroids at Ecrillais.

Sponges

The total number of sponge species recorded was 36 which is relatively high for this level of survey. It can be compared with Isles of Scilly, 2008 – 31 species (Sharrock, 2008) and Alderney 2007-8 – 30 (Wood 2007 & 2008). The sites with the greatest diversity of sponges reflect those with a high overall diversity, Guillaumesse (18), Pavlaison (18), Grune du Nord (17), Vingt Clos (17) and Les Dents (16).

Many of the species observed were typical of clean water rocky environments in SW Britain with such conspicuous species as the hedgehog sponge, *Polymastia boletiformis*, elephant-hide sponge, *Pachymatisma johnstonia*, yellow staghorn sponge, *Axinella dissimilis*, and purse sponge, *Scypha ciliata*, all widespread and common.

Less commonly recorded sponges which were present were *Adreus fascicularis* and *Axinella damicornis*, which are both listed as nationally scarce in the UK but are probably under-recorded. Other less common sponges were *Ulosa digitata* and *Homaxinella subdola*, both of which are south-westerly species. All also occur around Alderney.

Species which are rarely recorded in Seasearch surveys included *Leuconia gossei*, described as uncommon and confined to the SW of the British Isles (Ackers *et.al.* 2007), *Endectyon delaubenfensi*, also a south-westerly species and *Hexadella racovitzae*, a distinctive purple encrusting sponge which has only recently been identified, and also occurs on Alderney (Wood, 2007 & 2008).



Figure 21: The purple sponge *Hexadella racovitzae*, Les Dents (CW)

Hydroids, anemones and corals

Hydroids were regularly recorded at all of the offshore sites with the most widely distributed species being the antenna hydroid, *Nemertesia antennina* and the Indian feathers hydroid, *Gymangium montagui*, both recorded from 7 different sites.

The three sites with the highest density of hydroids were quite different. The Gouliot Caves contained both species of oaten pipes hydroid, *Tubularia indivisa* and *T. larynx*, both of which were common and an *Obelia* species was also abundant (Figure 22). The latter may be *Obelia geniculata* but this is more commonly found on kelp blades. *Tubularia indivisa* was also superabundant at Ecrillais and abundant at Vingt Clos. In each case the high density of hydroids reflects the very strong tidal streams at these sites.



Figure 22: Beadlet anemones, *Actinia equina* and hydroids, *Obelia* sp. in the Gouliot Caves (CW)

All three of the British species of soft corals, dead men's fingers *Alcyonium digitatum*, red fingers *Alcyonium glomeratum* and pink fingers *Alcyonium hibernicum* were present. *Alcyonium glomeratum* was the most common of the three species in Sark, unlike the remainder of the British Isles, where *Alcyonium digitatum* dominates. *Alcyonium hibernicum* is a much rarer species throughout its range and is most commonly found in dark situations, such as caves and overhangs, in shallow water. The record at Pavlaison, however, was from 22m depth which is unusually deep for this species.



Figure 23: Pink soft coral, *Alcyonium hibernicum*, Pavlaison (SS)

The pink sea fan, *Eunicella verrucosa* was seen at 7 sites, though it was never common (See section 4: page 21).

Amongst sea anemones the most commonly recorded species was the jewel anemone, *Corynactis viridis* (Figure 24 left), recorded at 9 sites and at least common at each one. At Ecrillais it was recorded as abundant and at Vingt Clos superabundant.

Also commonly recorded was the yellow cluster anemone, *Parazoanthus axinellae* (Figure 24, right), from 6 sites. This is on the list of nationally scarce species in the UK but it has a south-westerly distribution and is commonly seen in the Alderney (Wood 2007 & 2008). Much less rarely recorded, partly because of its tendency to retract into sediment is the imperial anemone *Aureliania heterocera*. This was seen at Pavlaison.



Figure 24: Two common anemones. Left: jewel anemones, *Corynactis viridis*, Vingt Clos (SS). Right: yellow cluster anemones, *Parazoanthus axinellae*, Grune du Nord (SS)

The rarest anemone recorded was the large *Pachycerianthus* sp. It is unsure exactly which species this is but it differs from *Pachycerianthus multiplicatus*, which is found in muddy sea bed, in terms of habitat. There is only one possible record of this crevice dwelling variety in England. A single species was seen at Guillaumesse (Figure 25).



Figure 25: Large burrowing anemone, *Pachycerianthus* sp., Guillaumesse (FR)

The Devonshire cup-coral, *Caryophyllia smithii*, has a widespread distribution and is common throughout the British Isles. It was the most commonly seen cup-coral in Sark Three other much less common cup-corals were also recorded, the southern cup-coral *Caryophyllia inornata* (Sardriere, Pavlaison), the scarlet-and-gold cup-coral *Balanophyllia regia* (Les Dents, Guillaumesse) and the sunset coral *Leptopsammia pruvoti* (L'Étac). All of these are nationally scarce or rare in the UK.



Figure 26: Sunset cup-coral *Leptopsammia pruvoti*, L'Étac (SS)

Worms

Low numbers of flatworms and segmented worms were observed and diversity was low. The only surprising record was a large sabellid fan worm seen at Guillaumesse which may be *Sabella spallanzani*, a Mediterranean species (Figure 7 page 13).

Crustacea

Crabs, lobsters, shrimps and prawns were notable for their small numbers and low diversity at most sites. Only 13 species were recorded, 5 barnacles, 1 prawn, 4 lobsters and 3 crabs. A single crawfish or spiny lobster, *Palinurus elephas*, was seen. This has become nationally scarce in the UK as a result of over-exploitation and is a Biodiversity Action Plan species.

At Derrible Bay snakelocks anemones contained the anemone prawn, *Periclimenes sagittifer* (Figure 13 page17). This prawn occurs regularly in the Channel Islands (Daly, 1998) but until 2007 had not been recorded in southern England. It is currently only known from Swanage, Dorset in the UK.

Molluscs

The most commonly recorded mollusc in the survey the painted topshell, *Calliostoma zizyphinum*. This is rarely found on the shore but commonly seen on sublittoral rocky surfaces all around the UK.

The most significant mollusc recorded is the ormer, *Haliotis tuberculata*, the signature mollusc species of the Channel Islands. This was only seen at Guillaumesse but, as a very shallow water species it is most likely to have been under-recorded.

Ten of the mollusc species were nudibranchs or sea slugs. Three of them are listed as nationally scarce or rare in the UK, *Thecacera pennigera*, the sponge sea slug *Doris sticta* and the sea fan sea slug *Tritonia nilsodhneri*. All three of these have a south-westerly distribution in the UK.

Bryozoans

Bryozoans are often a major part of the short animal turf in areas where there is no urchin grazing. Many are small and difficult to identify. In this case we had a bryozoan specialist amongst the team who took samples at most sites and made identifications from them. This has led to a very high species count for Sark compared to other Seasearch surveys (47 species) but abundances and habitat information is more limited.

The most widespread bryozoans recorded were the spiral bryozoans, *Bugula spp.* Of these *Bugula plumosa* was the most often identified and was abundant at Les Dents and Guillaumesse. Other species recorded as common from one or more sites were the two sea mats which grow on kelp blades, *Membranipora membranacea* and *Electra pilosa*, and the twiggy shaped *Bicellaria ciliata*.



Figure 27: Spiral bryozoans, *Bugula plumosa*, Vingt Clos (CW)

The largest and most prominent deeper water bryozoan, the potato crisp bryozoan *Pentapora foliacea*, was seen at seven sites, usually with an abundance of occasional or rare.

Starfish, urchins and sea cucumbers

Echinoderms were not numerous with only eight species recorded. Seven of these were widespread and common species in south-west Britain. Both sea urchins and sea cucumbers were much lower in abundance than at similar sites on the north side of the English Channel.

The most noteworthy record was of the bright red starfish *Echinaster sepositus* (Figure 28). This species reaches the northerly extent of its distribution in the Channel Islands and does not occur elsewhere in the Britain and Ireland. A single specimen was seen at les Dents



Figure 28: *Echinaster sepositus*, Les Dents (SS)

Sea squirts

Sea squirts are relatively short lived species and may colonise disturbed areas after storms. Only nine species were recorded, all of which have a widespread distribution in Britain and Ireland. The most widely recorded species was the orange sea squirt *Stolonica socialis* which was found at most of the deeper sites where it can be a characterizing species forming a yellow/orange low turf of sea squirts and sponges (Figure 10 page 15). It was frequent at most suitable sites but recorded as abundant at Les Dents and common at Pavlaison. The only other sea squirt recorded as common was the four spotted sea squirt *Morchellium argus*, at Guillaumesse.

Fishes

The number and variety of fishes recorded was relatively low with 16 species, of which all but one were occasional or rare. This included surprisingly low numbers of such widespread species as pollack and bass. The only species recorded as frequent was ballan wrasse, *Labrus bergylta*, at Ecrillais and Vingt Clos.

Three less often recorded fishes are of particular interest:

The black face blenny, *Tripterygion deleasi*, is arguably the signature fish of the Channel Islands. Whilst it does occur along parts of the south coast of England, and seems to be spreading westwards, it is much more common in the Channel Islands. Small numbers were seen at four of the sites visited and had we visited more



Figure 29: Black faced blenny, *Tripterygion deleasi*, Guillaumesse (VC)

shallow sites there would certainly have been more.

The marbled electric ray, *Torpedo mamorata*, is rarely recorded by divers and has a limited southerly distribution in Britain and Ireland. A single specimen was seen at les Dents.

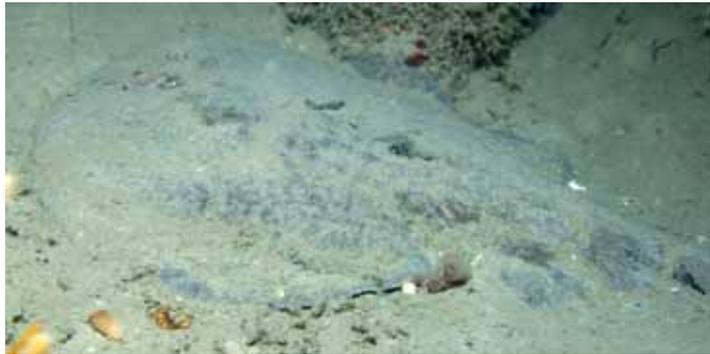


Figure 30: Marbled electric ray, *Torpedo mamorata*, Les Dents (SS)

The ocean sunfish, *Mola mola*, as its common name suggests, is a rare visitor to inshore waters. A single fish was seen at Sardriere.

Seaweeds

Only limited records were made of seaweeds, and no specimens were taken. The number of species recorded is therefore low, and limited to the larger and more prominent species. There are likely to be many more seaweeds presenting Sark, especially in the shallower rocky areas adjacent to the coast.

Amongst the red seaweeds, the harpoon weed, *Asparagopsis armata* is an introduced species which was recorded as common at two of the shallow sites, Havre Gosselin and Derrible Bay. This species has barbed branches and attaches to and becomes entangled with other seaweeds.



Figure 31: Harpoon weed, *Asparagopsis armata*, Havre Gosselin (SS)

The brown seaweeds include most of the large species, including the kelps. In most parts of the British Isles the primary kelp forest species is *cuvie*, *Laminaria hyperborea*. In Sark, as elsewhere in the Channel Islands, the golden kelp, *Laminaria ochroleuca*, is almost equally common. The two species are often found in mixed and both occurred commonly at all of the rocky sites. They can be distinguished by the stipe, which is rough in *L. hyperborea* and smooth in *L. ochroleuca*. The latter has a golden colour to the stipe and a crescent of gold at the base of the blade. A third large kelp, furbelows, *Saccorhiza polyscides*, was much less common.



Figure 32: Golden kelp, *Laminaria ochroleuca*, Havre Gosselin (CW)

The non-native brown seaweed japweed, *Sargassum muticum* was seen at Derrible Bay and Baleine Rock. This species is widely found in southern and western Britain and Ireland and its fast rate of growth and large size (up to 2m) can both cause clogging of shallow sheltered areas such as harbours as well as out competing native seaweeds. It frequently occurs with two other large brown species, mermaid's tresses, *Chorda filum*, and thongweed, *Himanthalia elongata*, both of which were recorded in Derrible Bay and Havre Gosselin.

Flowering plants

Seagrasses are the only marine flowering plants and the sublittoral species is eelgrass, *Zostera marina*. Eelgrass beds are commonly threatened by coastal development and moorings and are a Biodiversity Action Plan habitat in the UK.

We looked for seagrass at both Baleine Rock and in Derrible Bay, both areas where it was believed to have been found in the past. In the case of Baleine Rock a few plants were seen on one of the two dives in different areas, but there were none in Derrible Bay. It is unclear if populations have reduced or if we were not looking in the right locations.



Figure 33: Eelgrass, *Zostera marina* near Baleine Rock (CW)

6 References

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7. Acknowledgements

The Seasearch team would like to thank Sally Sharrock for organising the trip and all of those who helped us whilst we were on the island.

Andy Leaman, Sark Diving Services, arranged for our accommodation, diving and transporting us from Guernsey. His experience was invaluable in getting us to sites at slack water

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Thanks are also due to all of those who offered hospitality whilst we were in Sark and particularly to Sue Guille for providing us all with a cream tea!

Appendix 1 Recording Forms

Record no

Seasearch Observation Form



www.seasearch.org.uk

This form asks for two types of information from your dive - what the seabed was like and what marine life you saw. Please read the guidance notes before completing the form. By completing this form you will be adding to our knowledge of the near-shore marine environment - helping it to remain fit for life!
Please complete the following sections in a black pen and BLOCK CAPITALS

Name	
Address	
Postcode	
Tel: Home	Mobile
Email	
Buddy's Name	

Site Name	Date of Dive	/	/
General Location (inc county)	Start of dive	:	(gmt)
	Dive duration		(mins)
	Max depth of survey	m	
	U/W visibility	m	
	Sea Temperature	°C	
Position at start of dive		or OS Grid Reference	
	0	.	N
	0	.	W or E
Position derived from (circle)	Other	Drift dive?	yes / no
GPS Admiralty Chart	OS Map (state)	Night dive?	yes / no
Did you take any photographs?		yes / no	or video footage? yes / no

SO1-02/07

Thank you for completing this form
All that's left for you to do is to either hand it to the Dive Organiser or fold it into thirds along the dotted lines, tuck one part into the other, add a stamp and send it off. Your contact details will be included on the Seasearch database and those of partner organisations and will be used to send you information about Seasearch and associated projects. It will not be passed to third parties without your consent. The location, dive details, habitats and species information and the name of the recorder will be entered into a database and made available to the participating organisations and the general public. If you do not agree with this use of the data do not submit the form.

for Seasearch use only

validated by date

MarRec No entered by date

first fold

Please fill stamp here

Seasearch
Marine Conservation Society
Unit 3, Wolf Business Park
Alton Road
Ross-on-Wye
Herefordshire
HR9 5NB

second fold and tuck in



Seasearch is a joint project co-ordinated by the Marine Conservation Society and supported by: The Heritage Lottery Fund, The Wildlife Trusts, English Nature, Countryside Council for Wales, Scottish Natural Heritage, Environment & Heritage Service Northern Ireland, Joint Nature Conservation Committee, Environment Agency, Marine Biological Association (MarLIN), British Sub-Aqua Club, Professional Association of Diving Instructors and Project Aware, Scottish Sub-Aqua Club, Sub-Aqua Association and the Nautical Archaeology Society.

SEASEARCH SURVEY FORM

Form No (leave blank)

- If anything is unclear please refer to the **Guidance Notes**
- Each pair of divers should complete a form between them
- Please complete all parts of the form. Where there is a * only fill in the information if you know it.



Validated by	Date	Entered by	Date	MR Reference
Recorder leave blank - for Seasearch use				

Your details

Name	Tel No:	hm/wk
Address	Email:	
	Buddy's Name	
	Name of group or survey	
Postcode		

Dive/Site details

Site name				Date of dive: dd / mm / yy	
General location				Start of dive: : (24hr)	
				Dive duration: (mins)	
				U/W visibility: m	
				Sea temperature: °C	
Position	Latitude	Longitude	W or E	Drift dive? yes / no	
Centre of site	° .	° .		Night dive? yes / no	
For drift dives				Did you or your buddy take any of the following?	
From	° .	° .			photographs yes / no
To	° .	° .			video footage yes / no
Or OS Grid Reference				specimens yes / no	
Position derived from: (circle)		GPS Datum (circle)		seaweeds for pressing yes / no	
GPS	Admiralty chart	OS map	other		
				WGS84 OSGB36	
Exposure of site: extremely exposed <input type="checkbox"/> v exposed <input type="checkbox"/> exposed <input type="checkbox"/>				For the area surveyed, what was	
mod exposed <input type="checkbox"/> sheltered <input type="checkbox"/> v sheltered <input type="checkbox"/> ext sheltered <input type="checkbox"/>					the shallowest depth? (m) <input type="text"/> bsl <input type="text"/> bcd
Max tidal stream:					the deepest depth? (m) <input type="text"/> bsl <input type="text"/> bcd
>6kt <input type="checkbox"/> 3-6kt <input type="checkbox"/> 1-3kt <input type="checkbox"/> <1kt <input type="checkbox"/> v. weak <input type="checkbox"/>				Tidal correction to chart datum <input type="text"/> m*	

Seabed summary

Summarise: a. The main features of the site, b. Any unusual features or species, c. Any human activities or impacts at the site

SS1 12/07

1

Habitat descriptions

Complete a box below for each **habitat** you found on your dive. Normally the shallowest habitat is No. 1 even if you have done the dive deepest first. Each written description should tally with the information entered in the columns and diagrams on the next page. If you found more than 3 habitats, continue your descriptions on another form. Tick boxes where shown, and insert percentages (they must add up to 100%) or assign a score from 1-5 as appropriate. If you are uncertain leave the box blank. The biotope code will be assigned later from your description.

1. DESCRIPTION (physical + community)

Seabed type: rock boulders cobbles pebbles gravel sand mud wreckage other

Communities: kelp forest kelp park red seaweeds enc pink algae animal turf

animal bed sediment with life barren sediment Biotope Code

2. DESCRIPTION (physical + community)

Seabed type: rock boulders cobbles pebbles gravel sand mud wreckage other

Communities: kelp forest kelp park red seaweeds enc pink algae animal turf

animal bed sediment with life barren sediment Biotope Code

3. DESCRIPTION (physical + community)

Seabed type: rock boulders cobbles pebbles gravel sand mud wreckage other

Communities: kelp forest kelp park red seaweeds enc pink algae animal turf

animal bed sediment with life barren sediment Biotope Code

1	2	3	
m			DEPTH LIMITS
			Upper (from sea level) (i.e. minimum)
			Lower (from sea level) (i.e. maximum)
			Upper (from chart datum) *
			Lower (from chart datum) *

%			SUBSTRATUM
			Bedrock type?:
			Boulders - very large > 1.0 m
			- large 0.5 - 1.0 m
			- small 0.25 - 0.5 m
			Cobbles (fist - head size)
			Pebbles (50p - fist size)
			Gravel - stone
			- shell fragments
			Sand - coarse
			- medium
			- fine
			Mud
			Shells (empty - or as large pieces)
			Shells (living - eg mussels, limpets)
			Artificial - metal
			- concrete
			- wood
			Other (state)
100	100	100	Total

1	2	3	
1-5			FEATURES - ROCK (all categories)
			Relief of habitat (even - rugged)
			Texture (smooth - pitted)
			Stability (stable - mobile)
			Scour (none - scoured)
			Silt (none - silted)
			Fissures > 10 mm (none - many)
			Crevices < 10 mm (none - many)
			Boulder/cobble/pebble shape (rounded - angular)
			Sediment on rock? (tick if present)

✓			FEATURES - SEDIMENT (1)
			Mounds / casts
			Burrows / holes
			Waves (>10 cm high)
			Ripples (< 10 cm high)
			Subsurface coarse layer?
			Subsurface anoxic (black) layer?

1-5			FEATURES - SEDIMENT (2)
			Firmness (firm - soft)
			Stability (stable - mobile)
			Sorting (well - poor)

Sketches and plans

Draw a **profile and/or plan** of the sea bed you encountered on your dive in the space below. Mark (& number) the different habitats, corresponding to the written descriptions on p.2. Indicate conspicuous and/or characteristic species. Make sure you include **depth(s)** (vertical axis) and a **distance** scale (horizontal axis) for a profile and scale and north point for a plan. Indicate the direction of the profile or plan and the direction of any current.

Pink Sea Fan Recording Form



About you

Name

Address

Postcode

Email



About your dive

Site Name General Location

Position
 Lat Long

or OS Grid Reference

Date Start time

Depth range of sea fans to

Habitat of sea fans (tick all that apply)

Sloping rock	Flattish rock	Wreck	Sediment covered rock	Boulders	Other (specify in notes)
--------------	---------------	-------	-----------------------	----------	--------------------------

Density of sea fans

Forest	Common	Occasional	Rare
--------	--------	------------	------

Additional notes on sea fans at this site

Return completed form to:

Seasearch, Marine Conservation Society, Unit 3, Wolf Business Park, Alton Road, Ross on Wye, HR9 5NB or Cornwall Seasearch, Cornwall Wildlife Trust, Five Acres, Allet, Truro, TR4 9DJ (Cornwall & Scillies records only)

Details of individual sea fans

	Width cm	Height cm	Feeding Y/N	Colour P/W	Condition D, 1-5	Fouling Species list	Fishing debris list	Sea fan anemone number	Sea fan sea slug eggs - number	Sea fan sea slug adults - number
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										



This Seasearch survey is organised by the Marine Conservation Society and Cornwall Wildlife Trust, with financial support from English Nature.



Appendix 2: Pink sea fan records

PINK SEA FAN RECORDS

Records from 2008

Site	Number Recorded	Depth (chart datum)		Abundance	width			height			% feeding	colour		Condition		Fouling organisms	sea slugs	
		min	max		mean	max	min	mean	max	min		pink	white	mean	dead		fans w eggs	fans w adults
Les Dents	39	7	23	occasional	22.2	60	2.5	23.4	55	4	81	31	2	3.49	6	silty turf, sponge, hydroids, bryozoans, <i>Alcyonium</i> , anemones, sea squirts	1	0
Guilliaumesse	44	0.2	19	occasional	27.8	50	2	25.3	45	3	49	41	0	4.00	3	silty turf, bryozoans, sponge, sea squirts egg case	3	5
Sardriere Pavlaison	11	12.5	17.5	common	31.2	50	8	23.9	35	10	18	11	0	4.18	0	bryozoans, fishing line	4	4
	9	5.5	17.5	occasional	29.2	45	8	25.3	40	10	19	8	0	3.22	1	silty turf, bryozoans, anemones, egg case	1	1
Grune du Nord	10	10	19	rare	32.2	55	13	29.9	40	17	67	8	1	3.80	1	silty turf, <i>Alcyonium</i>	0	0
L' Etac	10	12	17	occasional	35.3	55	17	24.3	35	16	100	9	0	3.50	1	silty turf, <i>Pentapora</i>	0	0
Vingt Clos	1	15	15	rare	45	45	45	25	25	25	100	1	0	5.00	0	-	0	0
Total	124				25.3	60	2	24.9	55	3	63	106	3	3.75	11		9	10

Whole dataset 2004-2006 (England, Wales, Ireland)

	1378	3	75		21.5	42	0.5	20.6	65	2		1358	20	4			167	235
--	------	---	----	--	------	----	-----	------	----	---	--	------	----	---	--	--	-----	-----

Channel Islands 2001-2002 (Guernsey, Sark, Minquiers)

	94	3.5	30.5		29.5	100	2	24.7	75	7	50	91	3	4.57			8	13
--	----	-----	------	--	------	-----	---	------	----	---	----	----	---	------	--	--	---	----

Appendix 3: Species List

Species Name	Common Name	Les Dents	Gouliot Caves	Havre Gosselin	Guilliaumesse	Sardriere	Pavlaison	Grune du Nord	Ecrillais	Derrible Bay	Baleine Rock	I' Etac	Vingt Clos
PORIFERA	SPONGES												
<i>Leuconia gossei</i>								O	R				
<i>Clathrina clathrus</i>	lace sponge				R								
<i>Leucosolenia</i>	spiky lace sponge	O	R		FO	O	OR	OO	F				CR
<i>Scypha ciliata</i>	purse sponge	FFO	O		C	O	OOO	FFR	C				CFFR
<i>Grantia compressa</i>	compressed purse sponge								O				
<i>Pachymatisma johnstonia</i>	elephant hide sponge	CFOO	OOO		FOOOO	OO	OOO	CO	OO			OO	FOR
<i>Dercitus bucklandi</i>	black tar sponge	R			R		R						
<i>Tethya citrina</i>	golf ball sponge	FFOOO	OOO		C	RR	OOO	OOR	O			R	ORRR
<i>Polymastia boletiformis</i>	hedgehog sponge	CFOOO	R		COO	O	FOORR	FOR				RR	FFO
<i>Polymastia penicillus</i>	chimney sponge		R		R		R		R				R
<i>Suberites carnosus</i>												R	
<i>Adreus fascicularis</i>					R			R					RR
<i>Stelligera stuposa</i>													O
<i>Cliona celata</i>	boring sponge	CFO	O		O	O	RRR	ORR	OO			R	RRR
<i>Axinella damicornis</i>					OOR	R		O				O	FOR
<i>Axinella dissimilis</i>	yellow staghorn sponge	AO			CFFOO	F	FOOOR	FO	R			O	FOOR
<i>Axinella infundibuliformis</i>	prawn cracker sponge						R	R				R	
<i>Homaxinella subdola</i>		OO			OO		R						OR
<i>Ciocalyptra penicillus</i>	tapered chimney sponge							R					
<i>Halichondria panicea</i>	breadcrumb sponge		R										
<i>Hymeniacion perleve</i>												R	
<i>Ulosa digitata</i>					R								
<i>Hemimycale columella</i>	crater sponge	FO	R		OOO	OO	ORRR	FR	R			ORR	FOR
<i>Myxilla incrustans</i>		O							R				R
<i>Endectyon delaubenfelsi</i>						R							
<i>Raspailia hispida</i>							R						
<i>Raspailia ramosa</i>		F			F	R	ORR	O				O	OO
<i>Haliclona fistulosa</i>	tasseled sponge	R			R	R	RR						R
<i>Haliclona simulans</i>	creeping sponge							R					
<i>Haliclona viscosa</i>	volcano sponge	R											
<i>Hexadella racovitzai</i>		R											
<i>Dysidea fragilis</i>	goosebump sponge					R	RR	R					
<i>Amphilectus fucorum</i>	shredded carrot sponge						R	R					
<i>Porifera indet crusts</i>		CFO	PP		RR	R	R						
<i>Porifera indet.</i>												FO	R
Total sponge species recorded		16	10	0	18	14	18	17	11	0	0	12	17

Species Name	Common Name	Les Dents	Gouliot Caves	Havre Gosselin	Guilliaumesse	Sardriere	Pavlaison	Grune du Nord	Ecrillais	Derrible Bay	Baleine Rock	I' Etac	Vingt Clos
CNIDARIA	ANEMONES & CORALS												
<i>Tubularia indivisa</i>	oaten pipe hydroid	F	CCC		O			F	SC				AF
<i>Tubularia larynx</i>	branched oaten pipe hydroid		C										
<i>Sarsia eximia</i>			P										
<i>Sertularia gayi</i>								R					OP
<i>Sertularia argentea</i>													P
<i>Nemertesia antennina</i>	antenna hydroid	CFO			FO	O	OOOO	O				O	OFRR
<i>Nemertesia ramosa</i>	branched antenna hydroid	CFO			O	R	R	R					R
<i>Plumularia setacea</i>			P										
<i>Aglaophenia</i>						O							
<i>Aglaophenia pluma</i>					O							O	
<i>Gymnangium montagui</i>	Indian feathers hydroid	CO			O	O	FOO	FO				OO	FOOOR
<i>Obelia</i>			A										
<i>Obelia geniculata</i>	kelp fur	A			F	FO	CF	F				OO	CC
<i>Alcyonium digitatum</i>	dead men's fingers	OR	OOO		ORRR			R	R				OR
<i>Alcyonium glomeratum</i>	red fingers	C			CFF	P	CFO	O				O	F
<i>Alcyonium hibernicum</i>	pink soft coral				RR		R						
<i>Eunicella verrucosa</i>	pink sea fan	OOO			OOO	R	RRR	R				O	OR
<i>Cerianthus lloydii</i>	burrowing anemone				R					R	R		
<i>Pachycerianthus indet</i>	'Dorothy' anemone				R								
<i>Epizoanthus couchii</i>	sandy creeplet					R	RR						
<i>Parazoanthus axinellae</i>	yellow cluster anemone	CR			OOOOR	O	FOO	R				R	
<i>Isozoanthus sulcatus</i>	peppercorn anemone	O			RR	P							
<i>Actinia equina</i>	beadlet anemone		SC										
<i>Anemonia viridis</i>	snakelocks anemone									O			
<i>Urticina felina</i>	dahlia anemone							R	R				
<i>Aureliania heterocera</i>	imperial anemone						R						
<i>Metridium senile</i>	plumose anemone		OO						R				R
<i>Sagartia elegans</i>	elegant anemone		F						C				R
<i>Actinothoe sphyrodeta</i>	white striped anemone	OO			R	R	RRR		O			R	RRR
<i>Corynactis viridis</i>	jewel anemone	CCO	CC		CFFF	COO	CCFOR	COR	A			CO	SAAFO
<i>Caryophyllia inornata</i>	southern cup-coral					R	R						
<i>Caryophyllia smithii</i>	Devonshire cup-coral	FO			FOR	R	ORR	R				R	OR
<i>Balanophyllia regia</i>	scarlet & gold star coral	P			R								
<i>Leptopsammia pruvoti</i>	sunset cup-coral											O	
total Cnidaria species recorded		13	10	0	18	14	14	13	7	2	1	11	15
PLATYHELMINTHES													
<i>Prostheceraeus vittatus</i>	candy striped flatworm		O										R

Species Name	Common Name	Les Dents	Gouliot Caves	Havre Gosselin	Guilliaumesse	Sardriere	Pavlaison	Grune du Nord	Ecrillais	Derrible Bay	Baleine Rock	I' Etac	Vingt Clos
ANELLIDA	SEGMENTED WORMS												
<i>Lanice conchilega</i>	sand mason worm									R	R		
<i>Bispira volutacornis</i>	double spiral worm	OR			R		R	R				R	RR
<i>Sabella sp.</i>							R					R	
<i>Sabella pavonina</i>	peacock worm				R								
<i>Sabella ?spallanzanii</i>					RR								
<i>Pomatoceros</i>	keelworm							O					
<i>Serpula vermicularis</i>	organ pipe worm				R								
<i>Filograna implexa</i>	vermicelli worm				R	O		R				R	
<i>Salmacina dysteri</i>	coral worm	O											
<i>Spirorbis</i>	posthorn worm					RR							
Total flat and segmented worms	Total	2	1	0	5	2	2	3	0	1	1	3	2
CHELICERATA													
<i>Nymphon gracile</i>	sea spider		R										
Total Chelicerata species recorded		0	1	0	0	0	0	0	0	0	0	0	0
CRUSTACEA	BARNACLES, SHRIMPS, PRAWNS, CRABS & LOBSTERS												
<i>Balanoidea</i>			C										
<i>Balanus balanus</i>	greater acorn barnacle			F									
<i>Balanus crenatus</i>	crenulated acorn barnacle						R						
<i>Balanus perforatus</i>	perforated barnacle		R										
<i>Boscia anglica</i>	cup-coral barnacle											R	
<i>Periclimenes sagittifer</i>	anemone prawn								R				
<i>Homarus gammarus</i>	common lobster		R		RR		R	R					
<i>Palinurus elephas</i>	crawfish					R							
<i>Galathea squamifera</i>	olive squat lobster				R								
<i>Galathea strigosa</i>	spiny squat lobster				R								
<i>Maja squinado</i>	spiny spider crab		OO		OR		RRR		R				
<i>Cancer pagurus</i>	edible crab				RR		R	R	R				RR
<i>Necora puber</i>	velvet swimming crab	OOR			R		RR	R	R			R	
Total Crustacea species recorded		1	4	1	6	1	5	3	3	1	0	2	1
MOLLUSCA	SHELLS AND SEA SLUGS												
<i>Haliotis tuberculata</i>	ormer				R								
<i>Gibbula cineraria</i>	grey topshell		RR							O			
<i>Calliostoma zizyphinum</i>	pinted topshell	OO	O		O	R	OR	RR	CO	OO		RR	ORR
<i>Patella</i>	limpet			F									
<i>Trivia arctica</i>	Arctic cowrie				R								
<i>Trivia monacha</i>	European cowrie							R					
<i>Ocenebra erinacea</i>	sting winkle								R				
<i>Buccinum undatum</i>	common whelk	R											
<i>Hinia reticulata</i>	netted dog-whelk									R			
<i>Tritonia nilsodhneri</i>	sea fan sea slug				R	R		R					

Species Name	Common Name	Les Dents	Gouliot Caves	Havre Gosselin	Guilliaumesse	Sardriere	Pavlaison	Grune du Nord	Ecrillais	Derrible Bay	Baleine Rock	I' Etac	Vingt Clos
<i>Diaphorodoris luteocincta</i>	fried egg sea slug							P				R	RR
<i>Crimora papillata</i>							O					R	
<i>Polycera faeroensis</i>	yellow edged polycera	O					ORRR	R				R	OR
<i>Limacia clavigera</i>	orange clubbed sea slug						R						
<i>Thecacera pennigera</i>		R											
<i>Cadlina laevis</i>		R											
<i>Doris sticta</i>	sponge sea slug						R						
<i>Coryphella</i>		R											
<i>Coryphella browni</i>								R	R				
<i>Pecten maximus</i>	king scallop						FO						
<i>Sepia officinalis</i>	cuttlefish				R		RR						
<i>Loligo</i>	squid	R											
Total mollusc species recorded		7	2	1	5	2	7	6	3	3	0	4	4
BRYOZOA													
<i>Crisia spp</i>	white claw sea moss	FO			F			O					F
<i>Crisia aculeata</i>						P	P	P				P	
<i>Crisia denticulata</i>						P		P					P
<i>Crisia eburnea</i>						P		P					P
<i>Tubulipora</i>			P				P					P	
<i>Plagioecia</i>		P							P			P	
<i>Lichenopora</i>							P						
<i>Disporella hispida</i>		P	P		P	P	P		P			P	
<i>Alcyonidium</i>													
<i>Alcyonidium diaphanum</i>	finger bryozoan	O			FF	P	FOOOO	FR				OP	AR
<i>Alcyonidium gelatinosum</i>							O	P					
<i>Nolella dilatata</i>						P							
<i>Vesicularia spinosa</i>					R		P	P					
<i>Amathia lendigera</i>		P											
<i>Aetea anguina</i>						P		P				P	P
<i>Membranipora membranacea</i>	sea mat	P			CF	P	F	F	C			CFP	P
<i>Electra pilosa</i>	frosty sea mat	O			O	P		FO	P			CP	P
<i>Flustra foliacea</i>	hornwrack												P
<i>Chartella papyracea</i>							P	P				P	
<i>Securiflustra securifrons</i>		F					OP	R					
<i>Bugula spp.</i>	spiral bryozoans				A		CCO						FOP
<i>Bugula flabellata</i>			O		OO	OOP	P	CFO				P	P
<i>Bugula fulva</i>								P					
<i>Bugula plumosa</i>		AC	P		AAF	FP	OP	P				FOPR	C
<i>Bugula turbinata</i>		OFF				OP	P	O				OP	FF
<i>Bicellariella ciliata</i>		P	P			C	P	P				P	P
<i>Caberea boryi</i>					O								
<i>Caberea ellisii</i>		P	P										
<i>Cellaria spp.</i>							O	O	P				CP
<i>Cellaria salicornioides</i>		P			PP	P		P				P	P
<i>Figularia figularis</i>		P					P						
<i>Escharoides coccinea</i>		P				P			P			P	

Species Name	Common Name	Les Dents	Gouliot Caves	Havre Gosselin	Guilliaumesse	Sardriere	Pavlaison	Grune du Nord	Ecrillais	Derrible Bay	Baleine Rock	I' Etac	Vingt Clos
<i>Reptadeonella</i>		P											
<i>Reptadeonella violacea</i>							P		P				
<i>Pentapora foliacea</i>	potato crisp bryozoan	CO			OR	FP	RRP	P				RRP	RRR
<i>Schizoporella unicornis</i>						P						P	
<i>Schizobrachiella sanguinea</i>							P					P	
<i>Smittina landsborovii</i>					P								
<i>Parasmittina trispinosa</i>		P					P						
<i>Schizomavella linearis</i>					P								
<i>Microporella ciliata</i>												P	
<i>Fenestulina malusii</i>												P	
<i>Haplopoma graniferum</i>		P				P	P	P				PP	
<i>Cellepora pumicosa</i>	orange pumice bryozoan		O			P	P	O				OP	
<i>Celleporina hassallii</i>						P		P				P	P
<i>Omalosecosa ramulosa</i>	monkey puzzle bryozoan	P			RP	P	OP	R				P	R
<i>Bryozoa indet crusts</i>			P				OP						F
Total bryozoa species recorded		20	8	0	15	22	25	24	7	0	0	24	19
ECHINODERMATA	STARFISH, URCHINS AND SEA CUCUMBERS												
<i>Luidia ciliaris</i>	seven armed starfish	R				R	R					R	
<i>Asterina gibbosa</i>	cushion star								O				
<i>Echinaster sepositus</i>		R											
<i>Henricia oculata</i>	bloody henry	O			R	R	OR						RR
<i>Marthasterias glacialis</i>	spiny starfish	OR			R	R	RR					R	RR
<i>Echinus esculentus</i>	common urchin	P			OOR	R	R	R					R
<i>Holothuria forskali</i>	cotton spinner				R		RR						
<i>Aslia lefevrei</i>	brown crevice sea cucumber				ORR		R						
Total echinoderm species recorded		5	0	0	5	4	6	1	1	0	0	2	3
TUNICATA	SEA SQUIRTS												
<i>Clavelina lepadiformis</i>	light bulb sea squirt	R	OO			R	R					R	
<i>Morchellium argus</i>	four spotted squirt	FF	P		CCO	R	RR						R
<i>Aplidium punctum</i>	club head sea squirt				O			O				R	O
<i>Diplosoma listerianum</i>	grey slime sea squirt				R								
<i>Diplosoma spongiforme</i>	sponge sea squirt	R											
<i>Lissoclinum perforatum</i>	white perforated sea squirt				O								
<i>Ascidia mentula</i>	red sea squirt	OO			OOOO	OR						R	R
<i>Stolonica socialis</i>	orange sea squirt	AACO			FFFO	FF	CFFFO	FO				F	FOOO
<i>Botryllus schlosseri</i>	star sea squirt	FF			RR	R	ORR	OO					OR
Total tunicate species recorded		6	2	0	7	5	4	3	0	0	0	4	5

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PISCES	FISHES												
<i>Torpedo mamorata</i>	marbled electric ray	R											
<i>Pollachius pollachius</i>	pollack	O			OO		R	R					OR
<i>Trisopterus minutus</i>	poor cod						R						
<i>Dicentrarchus labrax</i>	bass											R	
<i>Chelon labrosus</i>	grey mullet		OR										
<i>Centrolabrus exoletus</i>	rock cook				O		O	R					R
<i>Crenilabrus melops</i>	corkwing wrasse									O			
<i>Ctenolabrus rupestris</i>	goldsinny	O	OR		O	R	R					RR	OOR
<i>Labrus bergylta</i>	ballan wrasse	O	O		OO				F			RR	F
<i>Labrus mixtus</i>	cuckoo wrasse	O			OOOO	R	ORR		O			R	RR
<i>Lipophrys pholis</i>	shanny		O	P			R						
<i>Parablennius gattorugine</i>	tompot blenny	R	OOO		RR		R					R	RR
<i>Tripterygion delaisi</i>	black faced blenny	R			RR		R	R					
<i>Callionymus lyra</i>	dragonet										R		
<i>Gobiusculus flavescens</i>	two spot goby		O		R					F			R
<i>Mola mola</i>	ocean sunfish					R							
Total fish species recorded		7	6	1	8	3	8	3	2	2	1	5	7
ALGAE	SEAWEEDS												
<i>Rhodophycota</i>	various red seaweeds	ACF	F	C	CFO	FF	FFOOR	CFO	C	C		CCRR	O
<i>Asparagopsis armata</i>	harpoon weed			C						C			
<i>Corallina</i>									O				O
<i>Corallina officinalis</i>	coral weed			F									
<i>Mesophyllum lichenoides</i>	pink plate algae			P									
<i>Calliblepharis ciliata</i>	red fringe weed			F	O								
<i>Dilsea carnosa</i>	red rags												
<i>Chondrus crispus</i>	carragheen									O			
<i>Delesseria sanguinea</i>	sea beech	FO			O					C			
<i>Drachiella spectabilis</i>	rainbow weed	FFO											
<i>Phaeophyceae</i>	various brown seaweeds									C			
<i>Dictyopteris membranacea</i>	midrib fan weed				O								O
<i>Dictyota dichotoma</i>	brown fan weed								R			FOO	
<i>Arthrocladia villosa</i>											P		
<i>Chorda filum</i>	mermaid's tresses									O			
<i>Laminaria</i>	kelp												
<i>Laminaria hyperborea</i>	cuvie	SACF		A	AAOO	AO	AF					AF	AAR
<i>Laminaria ochroleuca</i>	golden kelp	ACCF		C	CFO	CO	CR	CO	C	C		FO	AAOO
<i>Saccorhiza polyschides</i>	furbelows				CR		F			O			O
<i>Halidrys siliquosa</i>	podweed				O	R						O	
<i>Himanthalia elongata</i>	thongweed			O						F			
<i>Sargassum muticum</i>	japweed									C	O		
<i>Enteromorpha</i>				P									
<i>Ulva lactuca</i>	sea lettuce									F			
<i>Codium fragile</i>	velvet horn			P									
<i>encrusting algae indet.</i>		OOO				R	RRRR					RRR	F
Total algal species recorded		6	1	10	8	5	5	2	5	11	2	6	7

SpeciesName	Common Name	Les Dents	Gouliot Caves	Havre Gosselin	Guilliaumesse	Sardriere	Pavlaison	Grune du Nord	Ecrillais	Derrible Bay	Baleine Rock	l' Etac	Vingt Clos
ANGIOSPERMAE	SEAGRASSES												
<i>Zostera marina</i>	eelgrass										0		
Total seagrass species recoded		0	0	0	0	0	0	0	0	0	1	0	0
TOTAL SPECIES RECORDED		83	45	13	95	72	94	75	39	20	6	73	80

Appendix 4 JNCC sublittoral biotopes identified

Infralittoral rock biotopes

- IR.HIR.KFaR.LhypR.Pk *Laminaria hyperborea* park with dense foliose red seaweeds on exposed lower infralittoral rock, (Guilleaumesse, Pavlaison)
- IR.HIR.KFaR.LhypR.LoCh Mixed *Laminaria hyperborea* and *Laminaria ochroleuca* forest on exposed infralittoral rock, (widespread –Les Dents, Guilleaumesse, Sardriere, Pavlaison, Ecrillais, Vingt Clos)
- IR.MIR.KR.LhypT.Ft *Laminaria hyperborea* forest, foliose red seaweeds and a diverse fauna on tide-swept upper infralittoral rock, (Grune du Nord, L' Etac)
- IR.MIR.KR.LhypT.Pk *Laminaria hyperborea* park with hydroids, bryozoans and sponges on tide-swept lower infralittoral rock, (Grune du Nord, L' Etac)
- IR.FIR.SG Infralittoral surge gullies and caves (Gouliot Caves)

Circalittoral rock biotopes

- CR.HCR.FaT.CTub *Tubularia indivisa* on tide-swept circalittoral rock, (Ecrillais)
- CR.HCR.XFa.ByErSp Bryozoan turf and erect sponges on tide-swept circalittoral rock, (Les Dents, Guilleaumesse, Grune du Nord)
- CR.HCR.XFa.CvirCri *Corynactis viridis* and a mixed turf of crisiids, *Bugula*, *Scrupocellaria*, and *Cellaria* on moderately tide-swept exposed circalittoral rock, (Sardriere, Vingt Clos)
- CR.HCR.XFa.SpAnVt Sponges and anemones on vertical circalittoral bedrock, (widespread – Les Dents, Pavlaison, Grune du Nord, L'Etac, Vingt Clos)

Sublittoral Sediment biotopes

- SS.SCS.CCS circalittoral coarse sediment, (Guilleaumesse, Pavlaison)
- SS.SSa.IFiSa.IMoSa infralittoral mobile clean sand with sparse fauna, (Baleine Rock)

Appendix 5: Dive positions and details

Name	Ref. Fig 1	Position	Date	Time In	Recorder(s)	Records made
Les Dents	1	49 ⁰ 25.530'N 02 ⁰ 23.715'W	23/06/08	1545	Vicky Cartwright Martin Pratt	2 Survey
Gouliot Caves and Havre Gosselin	2	49 ⁰ 25.912'N 02 ⁰ 22.737'W	24/06/08	1310	Martin Pratt Chris Wood	1 Survey 1 Obs
Guilliaumesse	3	49 ⁰ 26.704'N 02 ⁰ 22.168'W	22/06/08 26/06/08	1600 1455	Chris Wood Martin Pratt	1 Survey 1 Survey
Sardriere	4	49 ⁰ 27.23'N 02 ⁰ 21.85'W	26/06/08	1200	Vicki Billings	1 Survey
Pavlaison	5	49 ⁰ 26.854'N 02 ⁰ 20.806'W	25/06/08 27/06/08	1143 1220	Fiona Ravenscroft Sally Sharrock	1 Survey 1 Survey
Grune du Nord	6	49 ⁰ 26.190'N 02 ⁰ 19.871'W	23/06/08	1311	Sally Sharrock	1 Survey
Ecrillais	7	49 ⁰ 25.514'N 02 ⁰ 19.508'W	25/06/08	1504	Chris Wood	1 Survey
Derrible Bay	8	49 ⁰ 25.000'N 02 ⁰ 21.155'W	27/06/08	1555	Chris Wood	1 Obs
Baleine Rock	9	49 ⁰ 25.000'N 02 ⁰ 21.700'W	27/06/08	1545	Chris Wood	1 Survey
L'Étac	10	49 ⁰ 24.096'N 02 ⁰ 21.969'W	24/06/08	1100	Vicki Billings	1 Survey
Vingt Clos	11	49 ⁰ 24.110'N 02 ⁰ 21.500'W	22/06/08	1250	Jo Porter Fiona Ravenscroft Martin Pratt	3 Survey