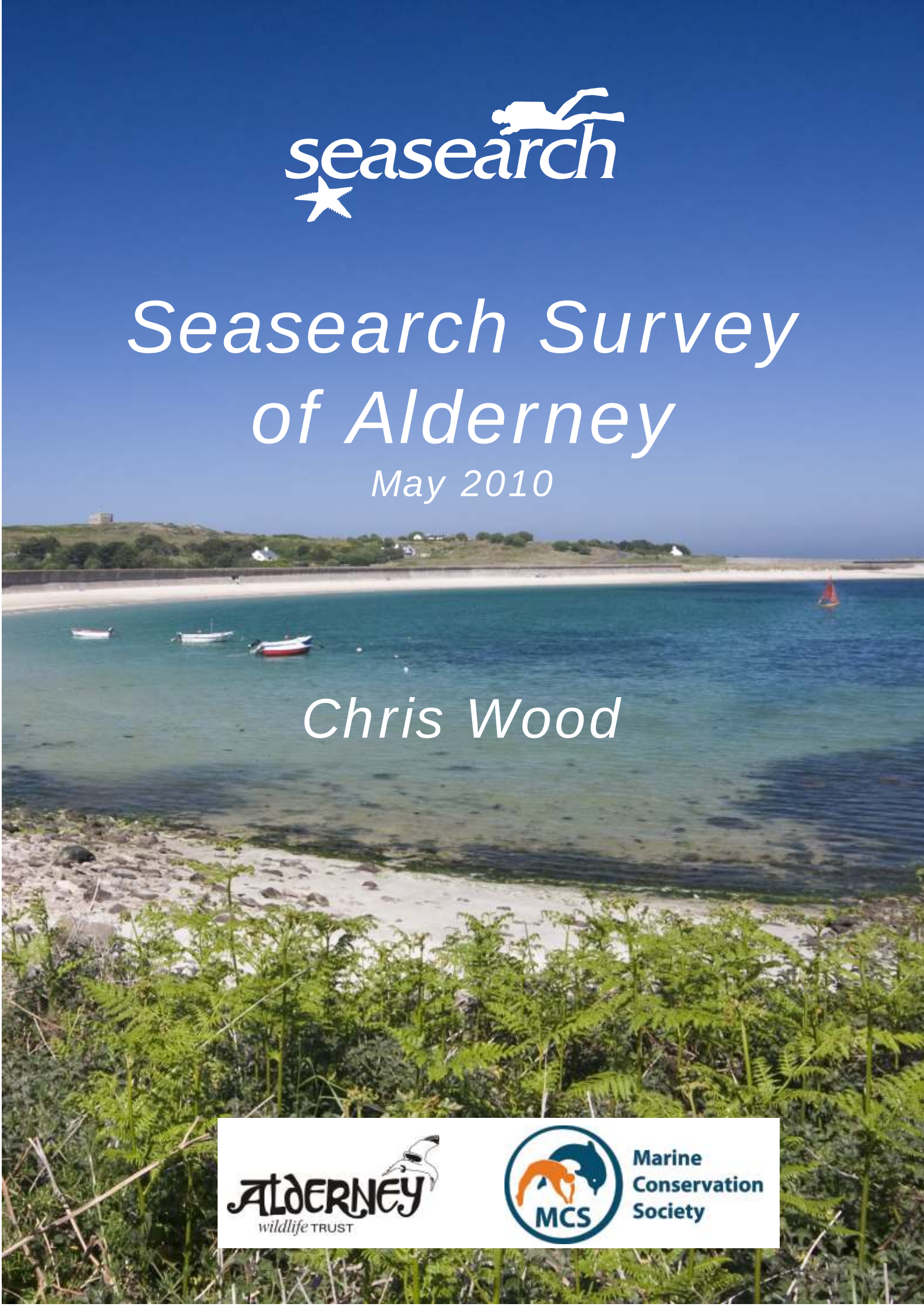

Seasearch Survey of Alderney

May 2010

Chris Wood

Alderney Wildlife Trust

Marine Conservation Society

www.seasearch.org.uk

Seasearch Survey of Alderney

May 2010
A report to the Alderney Wildlife Trust

by
Chris Wood

Marine Conservation Society

Alderney wildlife TRUST

December 2010

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 (CCW, JNCC, NE, NIEA, SNH), the Environment Agency, The Wildlife Trusts, the Marine Biological Association, the diver training agencies (BSAC, CFT, PADI, SAA, SSAC), Nautical Archaeology Society and independent marine life experts. Seasearch is supported financially by some 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 www.seasearch.org.uk

The objectives of the Seasearch programme are to:

- To gather information on seabed habitats and associated marine wildlife in Britain and Ireland through the participation of volunteer recreational divers.
- To encourage the participation of volunteer recreational divers in marine conservation through gathering data, particularly for areas where little data exists or where there is a conservation need,
- To provide training in recording skills to enable volunteer recreational divers to participate in Seasearch,
- To make quality assured Seasearch data available to partner organisations and the general public,
- To raise public awareness of the diversity of marine life and habitats in Britain and Ireland through the dissemination of information gathered and the identification of issues arising from it.

The Alderney Wildlife Trust

The Alderney Wildlife Trust aims to promote the conservation and protection of Alderney's terrestrial and marine wildlife and associated habitats, also to promote the conservation and protection of places of scientific interest, amenity value or natural beauty.
The Trust seeks to educate the public about the importance of sustainable development, biodiversity conservation and Alderney's wildlife, and to promote research in all branches of nature study.
Alderney Wildlife Trust Office, 51 Victoria Street, Alderney, Channel Islands, GY9 3TA.
Tel/fax: 01481 822935. www.alderneywildlife.org

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.
Marine Conservation Society, Unit 3, Wolf Business Park, Alton Road, Ross-on-Wye, HR9 5NB. Tel: 01989 566017, Website www.mcsuk.org

Table of Contents

Cover photo: Longis Bay by Sue Daly
Frontispiece: mixed seaweeds by Sue Daly

Synopsis

This report presents the results of a survey of sublittoral marine habitats and species carried out in Alderney in May 2010. The surveys used the Seasearch methodology and were carried out by volunteer divers from the Marine Conservation Society.

Seasearch surveys have previously been carried out in Alderney in 2007 and 2008 and reports are available of both surveys.

Seasearch was requested by the Alderney Wildlife Trust to carry out additional surveys in 2010 concentrating on the southern coastline of the island and including areas where cables for offshore tidal power turbines in The Race might come ashore.

Seven sites were surveyed, all of which, with the exception of Longis Bay, had not been visited before.

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.

Each site has been assessed in relation to its diversity and the presence of significant habitats and species.

High Importance

Longis Bay – presence of extensive seagrass beds across the whole of the mouth of the bay Sublittoral seagrass is a priority habitat in the UK and is nationally threatened primarily by physical disturbance from moorings. Cabling, whether laid on the surface or in a trench, could have a serious impact on the seagrass bed.

Frying Pan Bay - also has a seagrass bed across the central part of the bay.

La Tchue - The rocky margins and outcrops on the west side of the bay contain the greatest diversity of animal species in the study area and contain a number of nationally scarce or rare species.

Intermediate Importance

Les Boufresses Queslingue/ Frying Pan Bay/ Rousset - These three rocky areas all contain a wide diversity of animals and seaweeds and include some nationally scarce and rare species.

Lower Importance

The Sisters -the rocky habitats here are less varied, primarily because of their exposure and strong tidal streams.

Low Importance

South of Rubbish Tip - this is the site that already suffers from the most human impact both in terms of landscape impact above the surface and litter on the seabed. It is also an area characterized by mobile sand and strong tidal streams which also limit the diversity of marine life.

We recommend that no works which could adversely affect the habitats and species be carried out in the areas of high and intermediate importance and that, of the sites surveyed, only the areas of lower and low importance should be considered as landfall routes for cabling.

1. Introduction

Seasearch surveys were carried out in Alderney in 2007 and 2008 and reports are available of both surveys.

Seasearch was requested by the Alderney Wildlife Trust to carry out additional surveys in 2010 concentrating on the southern coastline of the island and including areas where cables for offshore tidal power turbines in The Race might come ashore.

The areas of particular interest to the Trust are shown in the aerial photograph below.

Figure 1: study areas

An inshore site south of Fort Houmet Herbé was surveyed in 2007 and was not re-visited. Longis Bay was also surveyed in 2007 and 2008 and was already known to contain a significant eelgrass bed, a Biodiversity Action Plan Habitat in the UK.

The team of four surveyors chosen for the survey included two generalist Seasearch surveyors (Chris Wood and James Lucey), a seaweed specialist (Francis Bunker) and an underwater photographer (Sue Daly). All are experienced divers who have taken part in a wide variety of sublittoral surveys.

Most diving was carried out from the Alderney Wildlife Trust's RIB. The diving took place over a 5 day period between 21st and 25th May, chosen for the neap tides. It coincided with good weather conditions allowing us to make the most of the time available.

Twelve survey forms were completed from 9 sites shown in the map below. In addition to notes made *in situ,* photographs were taken by all of the surveyors and some seaweeds were sampled for identification purposes.

The data on the recording forms and additional seaweed lists has been entered into the Marine Recorder database by the author, JNCC biotopes have been assigned to each habitat as a part of this process. The Marine Recorder file has been made available to the Alderney Wildlife Trust.

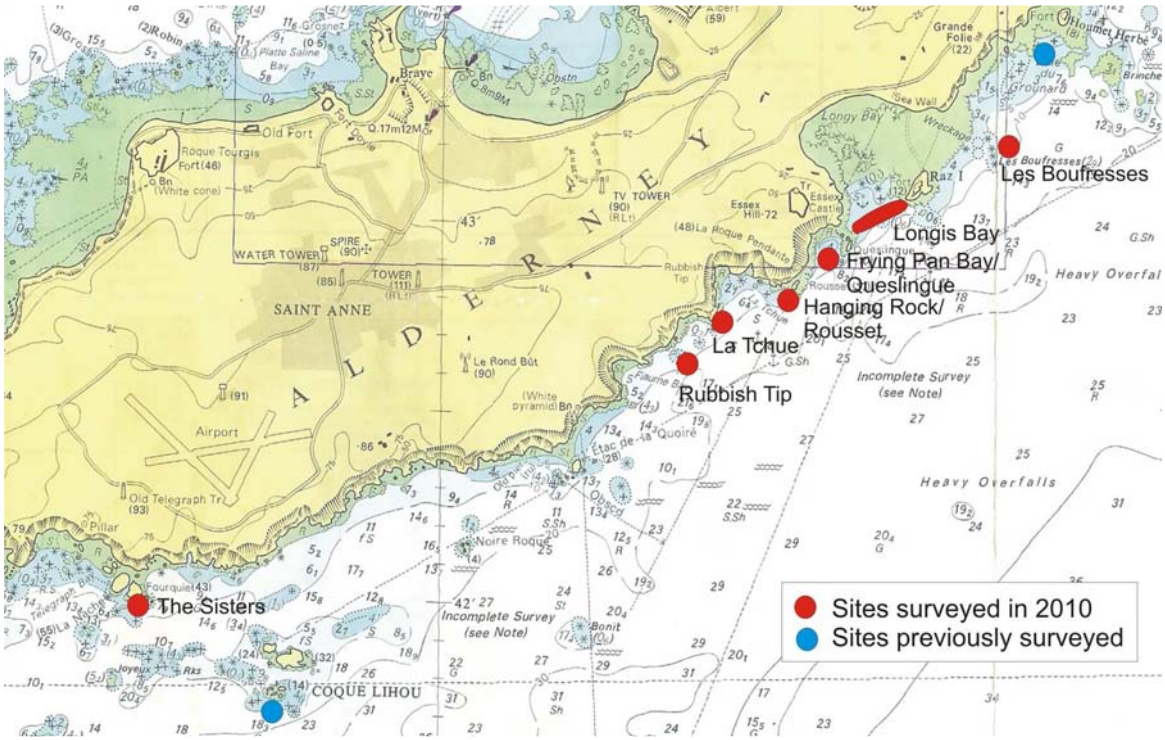

Figure 2: sites surveyed

2. Site Descriptions

The sites are described below in order from north to south. Site I, Baie du Grounard is taken from the 2007 report

Site 1 Baie du Grounard, south of Fort Houmet Herbé

(49^0 43.395'N 002^0 09.861'W)
Surveyed 25/06/07 by Lin Baldock, Fiona Ravenscroft & Chris Wood. 1 Survey Form completed

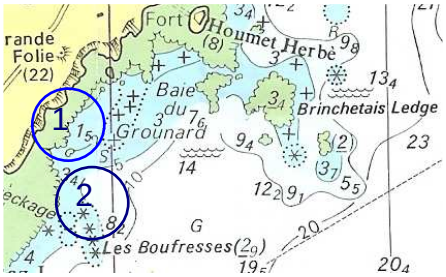

Figure 3: Baie du Grounard

Physical Environment
A shore dive with rocky gullies and pinnacles close inshore and sheltered from main tidal currents.

Habitat/Community Types
The seabed consisted of areas of steep sided rocky reefs with no obvious orientation, in shallow water just below the intertidal zone. Most surfaces were seaweed dominated with much thongweed *Himanthalia elongata* on upper surfaces, with occasional kelps, cuvie *L. hypberborea* and furbelows *Saccorhiza polyschides*. Vertical and overhanging rock faces had encrusting coralline algae and a short animal turf consisting mainly of bryozoans and sea squirts.

Observations/Features of Interest
Notable at this site were scour tolerant anemones, daisy anemone, *Cereus pedunculatus* and gem anemone, *Aulactinia verrucosa*. The latter has a westerly distribution in the British Isles. There are no recent records east of Portland Bill.

After the 2010 survey we have received a report of an eelgrass bed in the part of the bay closer to Fort Houmet Herbé (R. Gauvain *pers. comm*.)

Site 2 Les Boufresses

(49^0 43.162'N 002^0 09.681'W)
Surveyed 23/05/10. by Francis Bunker, Sue Daly, James Lucey & Chris Wood. Survey Form and separate seaweed list completed.

Physical Environment
Dive on the eastern side of the line of rocks running NE-SW. Sloping rocky seabed to the east dropping to a flat seabed of boulders, pebbles and coarse sand.

Habitat/Community Types
Sloping rock surfaces from 3-15m bsl with patches of pebble and coarse sand. Kelp forest of *Laminaria. hyperborea* with an understorey of sponges and red seaweeds. Flatter surfaces away from the rocks 15-18m bsl with kelp park on the boulders and pebbles. A sketch of the site is shown in Figure 4 below.

Observations/Features of Interest
There was a variety of plants and animal present, including 7 species of sponge and 41 seaweeds. Amongst the seaweeds of note was the presence of one plant of *Schmitzia neapolitana* on a pebble and an unidentified small *Cryptonemiales* species. Specimens were taken and are being analysed at NUI Galway.

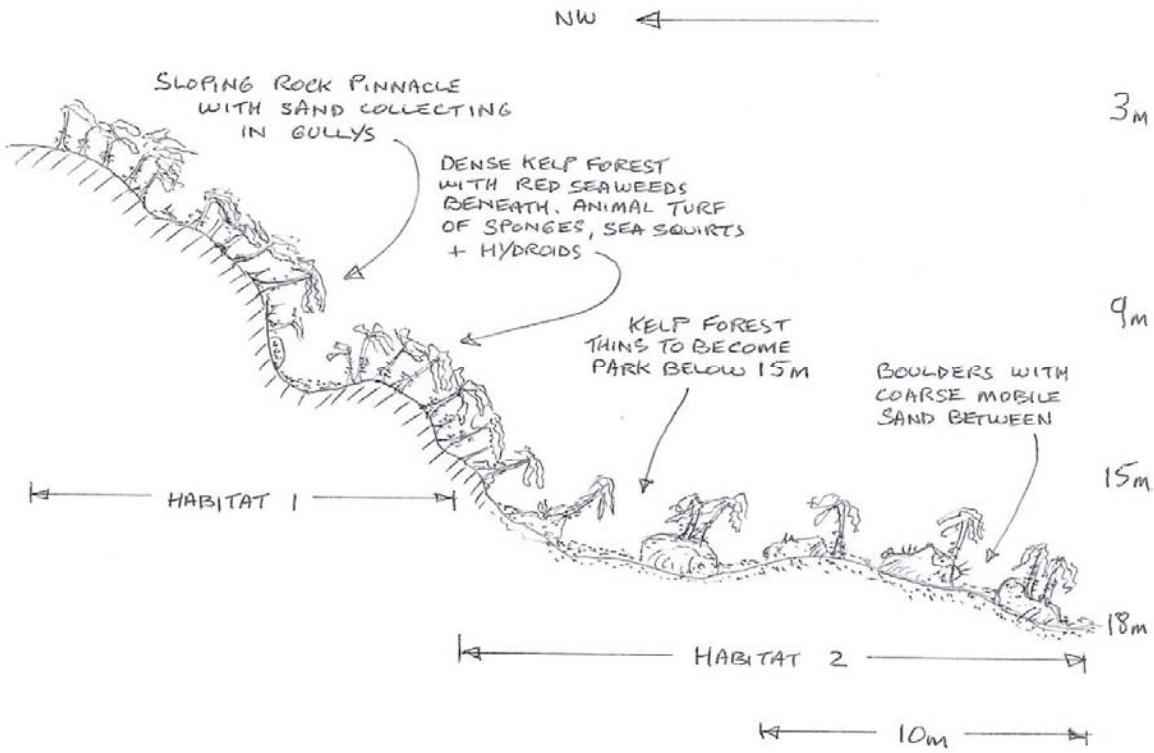

Figure 4: profile of Les Boufresses (JL)

Site 3 Longis Bay
(49^0 43.195'N 002^0 10.068'W)

Surveyed 21/05/10 by Sue Daly, James Lucey and Chris Wood and 25/05/10 by Francis Bunker, Sue Daly, James Lucey & Chris Wood. 2 Survey Forms and separate seaweed list completed.

Physical Environment

Longis Bay is the second largest sheltered bay on the island after Braye Bay. It opens to the south and is protected on its east side by Raz Island. Previous surveys have identified the presence of a significant eelgrass bed across the mouth of the bay. The purpose of the two dives undertaken was to identify more clearly the extent of the eelgrass bed and to collect records of seaweeds.

Figure 5: Longis Bay

Eelgrass Bed

On the dive on 21st May, undertaken from the Raz island causeway, the eastern and southern end of the bed was visited. This confirms that eelgrass is present right up to the rocky edges of Raz island and extends south in line with the southern rocky promontory to a depth of 11m bsl after which there is a more steeply sloping drop off of clean sand. The outer parts of the bed are current swept.

On the dive on 25th May two divers (JL & CW) dived across the mouth of the bay from Raz Island to Queslingue to establish the outer edge of the bed. There was continuous eelgrass across the whole of the mouth of the bay, with a 3m high rock pinnacle (shown on the chart) marking the outer edge in the centre. The edge was at a depth of 8-10m. Close to Queslingue the eelgrass went deeper and was not surveyed due to a strong outflowing current.

The two sketches below (Figures 6 & 7) show the results of the two surveys.

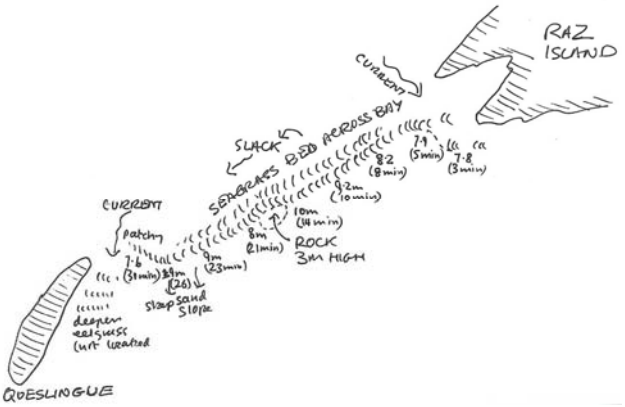

Figure 6 above – outer extent of eelgrass across Longis Bay (CW)

Figure 7 left – extent of eelgrass adjacent to Raz Island (CW)

Figure 8: Longis Bay eelgrass (SD)

Seaweed records

In the eelgrass bed there were few epiphytic seaweeds with only a filamentous brown, indeterminate, species recorded. There was also a limited range of small animals, including 4 anemones, of which *Peachia cylindrica* is relatively uncommon.

In the rocky areas 25 species of seaweeds were recorded, compared to 46 in 2007. There were two kelps, *Laminaria hyperborea* and *L. ochroleuca*, and the dominant foliose red seaweeds were *Chordaria flagelliformis, Brogniartella byssoides, Ahnfeltia plicata, Caliophyllis laciniata* and *Rhodothamniella floridula*. Of note was the presence of *Gracilaria bursa-pastoris,* a nationally scarce species.

Sites 4 and 5: Queslingue and Frying Pan Bay

Inner side of Queslingue (49^0 42.945'N 002^0 10.365'W)
Surveyed 23/05/10 by Francis Bunker and Sue Daly. 1 Survey Form completed
Frying Pan Bay and rocks south-west of Queslingue (49^0 42.950'N 002^0 10.460'W)
Surveyed 23/05/10 by Chris Wood & James Lucey. 1 Survey Form completed

Figure 9. Sites at Queslingue

Physical Environment

Queslingue is a 10m tall rock with a steep wall on the inner, western, side which reaches a depth of 8.5m bsl. There is a line of shallow rocks between Queslingue and the coastline by the Frying Pan Battery. To the south of the line of rocks is Frying Pan Bay which is sheltered from swells by Queslingue and rocks extending to the south. The bay has a sandy bottom. There is a strong tidal current at some states of the tide. The two dives looked at the inner rocky face of Queslingue, at the submerged rocks to the south and at the bay itself.

Habitat/Community Types

The inner face of Queslingue consists of a rock wall to a depth of 8.5m bsl with a ledge half way down. In the sublittoral fringe there was a dense covering of foliose red seaweeds whilst the cliff, despite its steepness, had a dense kelp forest containing both *Laminaria hyperborea* and *L. ochroleuca*. Beneath the kelp forest the rock was silty and was sparsely covered by foliose seaweeds.
To the south there were submerged rocky outcrops up to 6m tall. The tops and sides were also covered in kelps but the vertical and overhanging surfaces contained a greater range of sessile animals, including 13 species of sponge, as well as soft corals, cup- corals, jewel and white striped anemones, a single pink sea fan, bryozoans, sea cucumbers and sea squirts.
The centre of Frying Pan Bay comprised a sandy seabed with a tide-swept patchy eelgrass bed, with common filamentous brown seaweeds on the eelgrass.
The west side of the bay, adjacent to the main coastline, comprises small boulders covered in a kelp forest of *Laminaria ochroleuca* with an understorey of foliose red and brown seaweeds. The boulders were out of the tidal stream and were covered in a thin layer of silt.

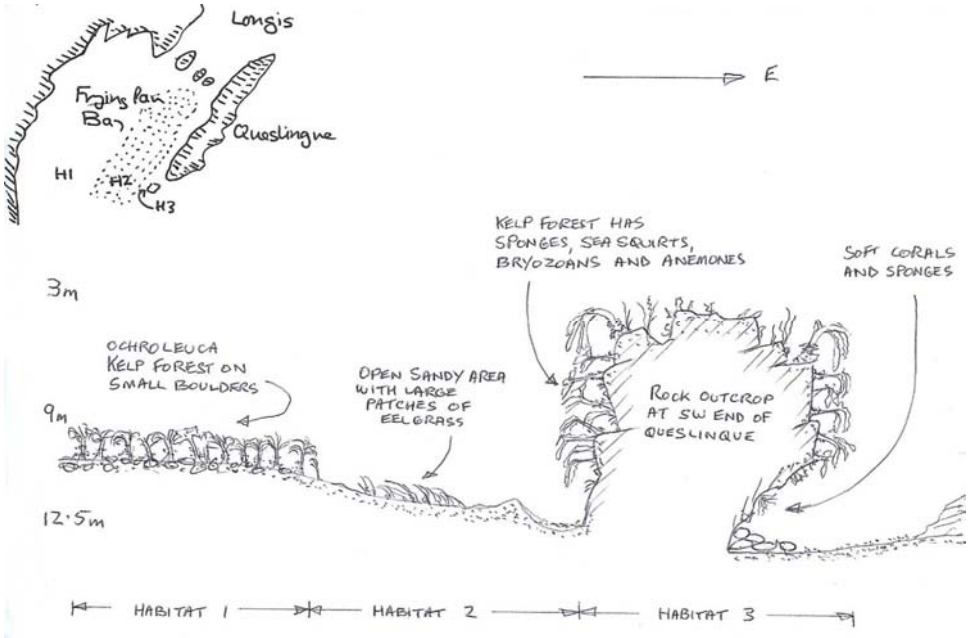

Figure 10: profile across Frying Pan Bay and rocks south of Queslingue (JL)

Observations/Features of Interest
Queslingue and Frying Pan Bay contain a wide range of habitats and species within a small area. 45 species of seaweeds were recorded from the face of Queslingue alone and there was a good range of animal species on the submerged rocks to the south. The boulder bed is an unusual feature in Alderney and was covered exclusively in the southern golden kelp, *Laminaria ochroleuca*. The eelgrass bed would be a priority habitat in the UK and the crumpled duster sponge, *Axinella damicornis*, which is nationally scarce in the UK. was also present.

Site 6: Rousset, below Hanging Rock

(49^0 43.823'N 002^0 10.567'W)
Surveyed 22/05/10 by Francis Bunker, Sue Daly, James Lucey & Chris Wood. 2 Survey Forms and separate seaweed list completed.

Physical Environment
Rousset is another long rocky outcrop similar to Queslingue but closer to the coast below the Hanging Rock. The outside face of the rock was surveyed, together with a series of smaller, largely submerged rocks to the south-west. The face of the rock dropped to a depth of 14m bsl and at the base was a flattish seabed of boulders and pebbles. There is a significant tidal stream along the rock and across the flat seabed.

Habitat/Community Types
The steep outer face of Rousset rock was dominated by a mixed kelp forest of *Laminaria hyperborea* and *L. ochroleuca* with an understorey of red foliose seaweeds, sponges and sea squirts. The tide-swept boulders and consolidated pebbles were also kelp forest covered and here the dominant species was *Laminaria ochroleuca*. Beneath the kelp the boulder/cobble surfaces were partly covered by mobile sand. There were 47 species of seaweeds in this habitat most of which were foliose reds. The majority of the animal life was on the vertical wall of the rock and included 16 species of sponges, as well as a range of cnidarians, bryozoans and sea squirts. There was relatively little animal turf on the flat seabed, largely due to the scouring effect of the mobile sand.

Observations/Features of Interest
The range of habitats here was similar to Queslingue/Frying Pan Bay, but without the eelgrass. Species of interest included small pink sea fans, *Eunicella verrucosa* (nationally scarce and Biodiversity Action Plan species in the UK), *Parazoanthus axinellae* (yellow cluster anemones), which are nationally scarce in the UK, *Codium vermilaria,* previous records from Jersey and southern England cited as doubtful, and the black faced blenny, *Tripterygion deleasi*, which has a southerly distribution and is only seen in a few places in southern England.

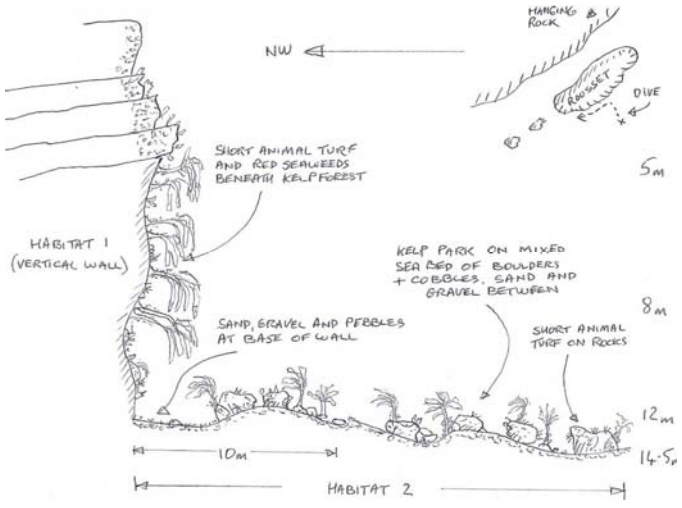

Figure 11: Profile at Rousset (JL)

Site 7: La Tchue

Site 1: west side of bay (49^0 42.735'N 002^0 10.885'W)
Surveyed 24/05/10 by James Lucey and Francis Bunker
Site 2: west side of rocks off western point (49^0 42.717'N 002^0 10.917'W)
Surveyed 24/05/10 by Chris Wood and Sue Daly.
2 Survey Forms completed and separate seaweed species list

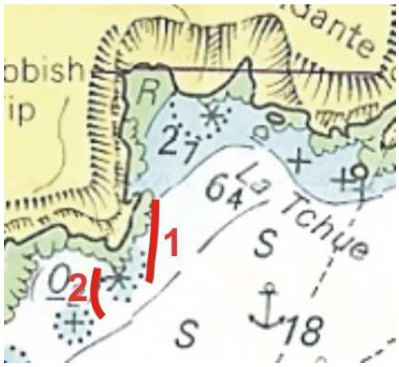

Figure 12: Dive sites at La Tchue

Physical Environment

La Tchue is a cliff backed bay with a sandy seabed in the centre and is sometimes used as a mooring area. Immediately to the west of the headland on the west side is the Alderney Rubbish Tip. Two areas were surveyed, one within the bay on the western side and one on the west side of the rocks that mark the western edge of the bay.
Within the bay (Site 1) the rock faces extended from the surface to 9m bsl. Below that was a slope of silted boulders and cobbles leading to a flat area at 13m bsl of bedrock, boulders and cobbles.
On the western side of the rocks (Site 2) the rocky surfaces extended from 8-14m bsl. Below that to the west was a flat seabed of mobile ridged coarse sand with shell fragments.

Habitat/Community Types

The rock surfaces were covered in a mixed kelp forest of *Laminaria hyperborea* and *L. ochroleuca* as at most sites. In the boulder habitats *Laminaria ochroleuca* was the dominant species, as on the west side of Frying Pan Bay. Beneath the kelp the surfaces were dominated by foliose red seaweeds, except for the vertical surfaces of the rocks off the point (Site 2) which had a mixed animal turf dominated by sponges and sea squirts.

Observations/Features of Interest

A surprisingly wide range of plants and animals was recorded with 43 seaweeds from site 1 and 15 sponges, 13 cnidarians, and a variety of crustaceans, molluscs, bryozoans, echinoderms, sea squirts and fishes at site 2. Of particular interest was the presence of the, rarely recorded, yellow sponge *Endectyon delaubenfelsi* (below left) and the scarlet and gold cup-coral, *Balanophyllia regia* (below right), which is nationally scarce in England. The black face blenny, *Tripterygion deleasi*, was also present. Amongst the brown seaweeds recorded was the nationally scarce *Carpomitra costata*.
There was evidence of rubbish on the seabed at both sites. This included plastic sacks, other pieces of plastic and car door handles. However the amount of rubbish seen was not as great as on the next site, suggesting that the dominant movement of the tipped material is to the south west.


Figure 13: *Endectyon delaubenfelsi* (SD)


Figure 14: *Balanophyllia regia* (SD)

Site 8: South of Rubbish Tip (49^0 42.65'N 002^0 11.00'W)

Surveyed 22/05/10 by Chris Wood, Sue Daly and James Lucey. 1 Survey Form completed.

Physical Environment

The site is south of the rubbish tip and was chosen as the area most likely to be already impacted by human activity. The rocky cliff line extends below the water to a depth of 8m bsl. Out from this the seabed is mostly barren rippled sand with occasional low-lying silted boulders at a depth of 16-18m bsl.

Habitat/Community Types

The shallow fringing rock supported a mixed kelp forest with an understorey of red foliose seaweeds. The silty boulders deeper down had mixed kelp at a lower density (kelp park) and a sparse short animal turf. The sand was largely barren with a few brittlestars and sand mason worms. It is likely to be mobile as some of the kelp plants were buried almost to the top of the stipe.

Observations/Features of Interest

There was considerable evidence of impact from the tip with much rubbish caught around the boulders and part buried in the sand. It included plastics, metal, cabling, tyres and netting. This was not a diverse or interesting site from the point of view of marine life and habitats.

Figure 15: Plastic rubbish at 16m (SD)

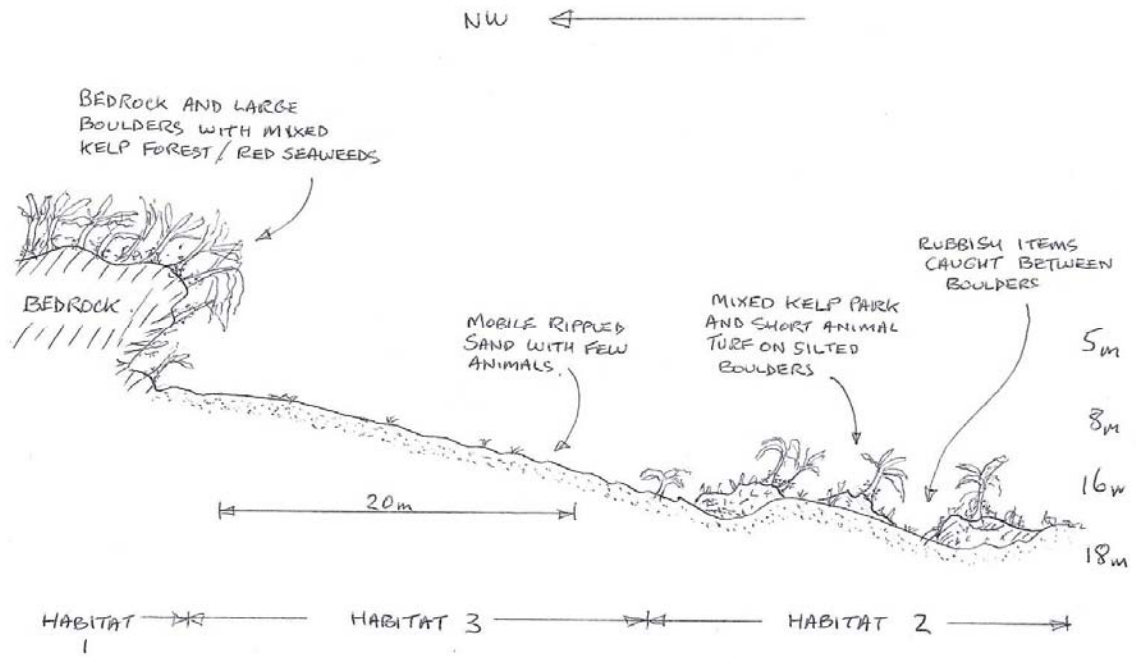

Figure 16: Sketch of seabed south of Rubbish Tip (JL)

Site 9: The Sisters, Telegraph Bay (49^0 42.00'N 002^0 13.37'W)
Surveyed 24/05/10 by Francis Bunker, Sue Daly, James Lucey & Chris Wood. 2 Survey Forms and separate seaweed list completed.

Physical Environment
Two pairs of divers surveyed infralittoral rock habitats adjacent to The Sisters rocks. One pair looked at the west side of La Nache in an area out of the main tidal stream, the other looked at the seabed to the south of the two Sisters rocks, where the tide was running strongly. In both case the seabed comprised of rock outcrops with narrow gullies between them. Most rock surfaces were colonized by large kelp plants, of three species, *Laminaria hyperborea, L. ochroleuca* and *Saccorhiza polyschides*. There was an understory of red seaweeds and a limited range of animal species on the vertical gully sides. The gully floors were of mobile cobbles and pebbles on a rock base.

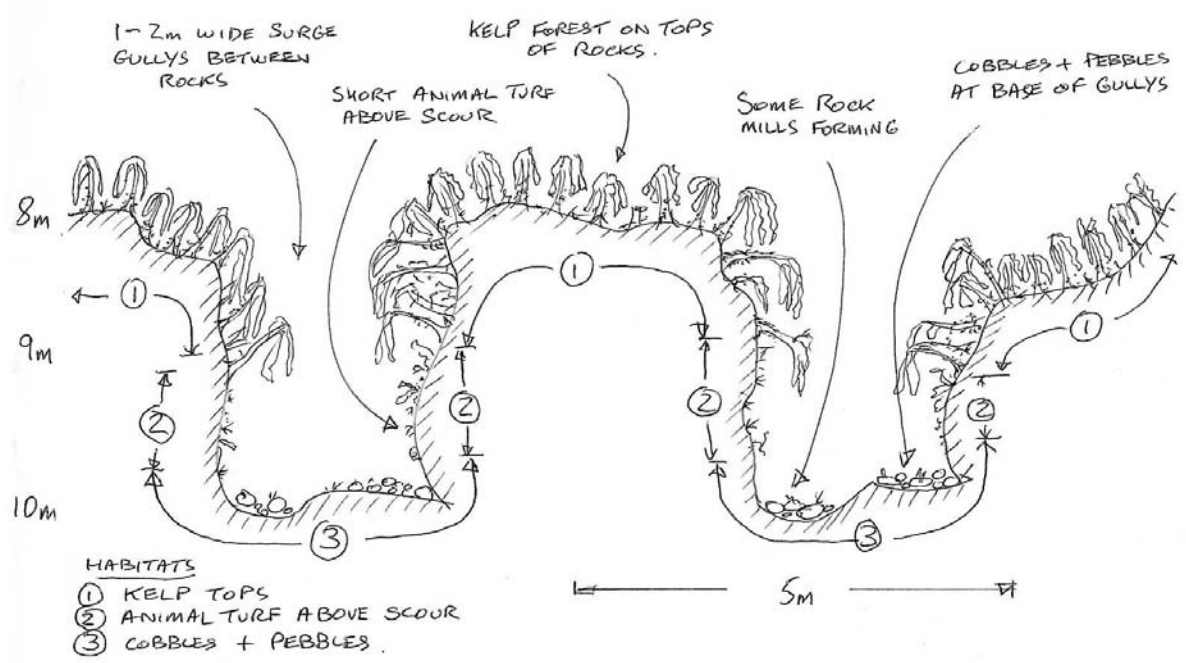

Figure 17: Sketch of seabed at The Sisters (JL)

Habitat/Community Types
This is a wave exposed and tide-swept area. The kelp forest in some areas was predominantly *Saccorhiza polyschides*, which is typical of disturbed rock, and the gullies contained young kelp plants and filamentous brown seaweeds, which are also typical of exposed locations. The number and variety of animal species was limited, presumably for the same reasons.

Observations/Features of Interest
Two seaweeds were seen which are only rarely recorded in southern Britain, *Haliptilon squamatum* and *Gelidum corneum*.

4 Discussion

4.1 Broad Conclusions

The purpose of the survey was to record seabed habitats and species in areas which might be considered for cabling for offshore tidal power turbines. We did not look at the areas where these might be placed.

From a conservation point of view we wanted to identify the most diverse habitats and those areas containing important or threatened species and habitats. These are the areas that we believe should be avoided. The following table is arranged in order of importance and the sites are shown in Figure 18 below.

High	Longis Bay	Extensive seagrass beds across the whole of the mouth of the bay from Raz Island to Queslingue. Sublittoral seagrass is a priority habitat in the UK and is nationally threatened primarily by physical disturbance from moorings. Cabling, whether laid on the surface or in a trench, could have a serious impact on the seagrass bed. The bay also contains two nationally scarce seaweeds, *Gracilaria bursa-pastoris* (this survey) and *Padina pavonica* (2007).
	Frying Pan Bay	Also has a seagrass bed across the central part of the bay. Not currently threatened by moorings due to the confined location and tidal streams.
	La Tchue	The rocky margins and outcrops on the west side of the bay contain the greatest diversity of animal species in the study area and contain a number of nationally scarce or rare species including the sponges *Adreus fasicularis* (nat. rare) and *Axinella damicornis* (nat. scarce), yellow cluster anemone *Parazoanthus axinellae* (nat. scarce), scarlet and gold start coral *Balanophyllia regia* (nat. scarce), black faced blenny *Tripterygion deleasi* (nat. rare – but frequent in Channel Islands) and the brown seaweed *Carpomitra costata* (nat. scarce). Also includes two recently identified and rarely recorded sponges which do not appear on the national scare/rare list; *Hexadella racovitzai* and *Endectyon delaubenfelsi.*
Intermediate	Les Boufresses Queslingue/ Frying Pan Bay Rousset	These three rocky areas all contain a wide diversity of animals and seaweeds and include some nationally scarce and rare species. These include pink sea fans *Eunicella verrucosa* (Queslingue and Rousset) and some of the species listed for La Tchue above.
Lower	The Sisters	The rocky habitats here are less varied, primarily because of their exposure and strong tidal streams. There have been cables in Telegraph Bay to the west for very many years.
Low	South of Rubbish Tip	This is the site that already suffers from the most human impact both in terms of landscape impact above the surface and litter on the seabed. It is also an area characterized by mobile sand and strong tidal streams, which limit the diversity of marine life.

An area not surveyed on this occasion is Baie du Grounard between Fort Houmet Herbe and Les Boufresses. This was looked at in 2007 and we have a subsequent report of seagrass in the area. This suggests that it should have the same Intermediate rating as Les Boufresses, but if there is a significant amount of seagrass then it should be high. The rocky margins between Raz Island and Les Boufresses were also not surveyed but are likely to be similar.

We also did not look at the centre of La Tchue. This is probably sandy but the movement of litter from the rubbish tip suggests a primarily south-westerly transport of material. If there were disturbance in the centre of the bay this could adversely affect the rocky margins to the south west which are of high importance.

Coque Lihou was briefly surveyed in 2008. Whilst clearly not a landing point for a cable it is shown on the map below as of intermediate importance, based on the 2008 records, and thus a route to be avoided.

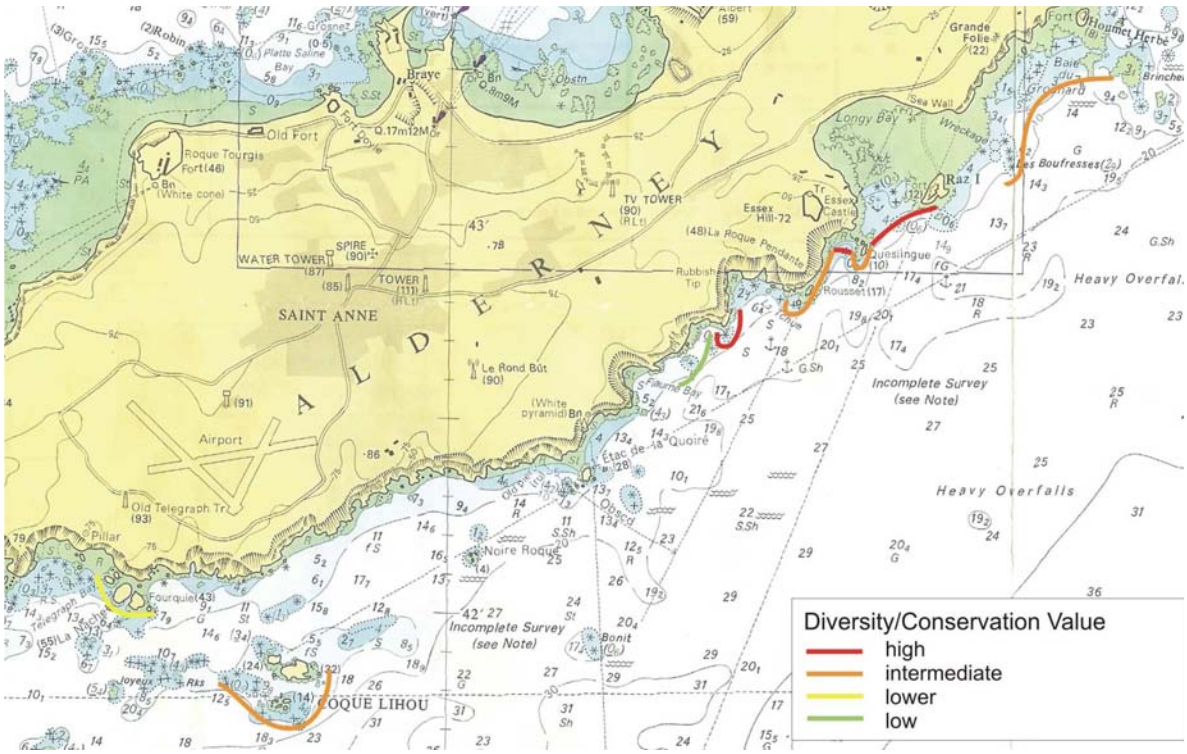

Figure 18: Diversity/Conservation value of sites surveyed

4.2 Range of habitats and biotopes

JNCC biotopes have been identified for all sites. 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.

The List of biotopes identified is shown in Appendix 2.

Twelve different biotopes were identified, the majority of which (8) are for Infralittoral Rock. This is unsurprising given the preponderance of shallow sites surveyed.

4.3 Diversity of species

Appendix 1 contains a list of all of the species recorded and the sites at which each species was present. It also shows the range of abundance for each site. This is because separate habitats are recorded and species may occur in more than one. Abundances use the SACFOR scale (superabundant-abundant-common-frequent-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.

Appendix 1 also shows all of the species previously recorded from our surveys in Alderney making a complete species list to date.

A total of 212 species is recorded for the survey comprising 106 animals and 106 plants in the following groups: The total for all of our surveys in Alderney to date is 194 animals and 150 plants.

		This survey	Total of all Alderney surveys
Sponges	Porifera	25	35
Jellyfish, hydroids, anemones and corals	Cnidaria	20	33
Flatworms	Playthelminthes	0	1
Segmented worms	Anellida	5	8
Barnacles, crabs, prawns and lobsters	Crustacea	7	16
Shells, bivalves and sea slugs	Mollusca	13	30
Sea mats and sea mosses	Bryozoa	9	15
Horseshoe worms	Phoronida	0	1
Starfish, sea urchins and sea cucumbers	Echinodermata	9	12
Sea squirts	Tunicata	7	16
Fishes	Pisces	11	27
Red seaweeds	Rhodophycota	76	101
Brown seaweeds	Phaeophyceae	20	35
Green seaweeds	Chlorophyceae	9	13
Flowering plants	Angiospermae	1	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 affected by the limited time available for an underwater survey, the tidal streams and differing recording skills, particularly for seaweeds. The sites with the greatest diversity overall were La Tchue and Rousset. In terms of animals recorded La Tchue is significantly more diverse than any other site. The plant records are more even with Rousset, La Tchue, Les Boufresses and Queslingue all reasonably diverse.

Sponges

Because of the lack of circalittoral habitats surveyed the sponge fauna was limited to 25 species. Species newly recorded for Alderney are *Grantia compressa* (Les Boufresses), *Leuconia gossei* (Rousset), *Stelligera stuposa* (Les Boufresses and Queslingue), *Myxilla rosacea* (La Tchue) and *Endectyon delaubenfelsi* (La Tchue). Two nationally scarce species recorded were *Adreus fasicularis* (Les Boufresses, Queslingue & La Tchue) and *Axinella damicornis* (Les Boufresses, Queslingue, Rousset & La Tchue).

Hydroids, anemones and corals

There were relatively few records of hydroids, anemones and corals, partly due to the shallow nature of the sites surveyed. Nationally scarce species are pink sea fan *Eunicella verrucosa* (Queslingue and Rousset), yellow cluster anemones *Parazoanthus axinellae* (Rousset and La Tchue) and scarlet and gold star coral *Balanophyllia regia* (La Tchue). New records for Alderney are branched antenna hydroid *Nemertesia ramosa* (Les Boufresses), helter skelter hydroid *Hydrallmania falcata* (Rousset) and two sand-dwelling anemones, *Sagartia troglodytes* (La Tchue & S of Rubbish Tip) and *Peachia cylindrica* (Longis Bay & S of Rubbish Tip).

Worms

No unusual flatworms or segmented worms were observed and numbers and diversity were low. Two newly recorded species for Alderney are *Megalomma vesiculosum* (Longis Bay) and *Sabella pavonina* (South of Rubbish Tip). Both are widespread in the Britain and Ireland.

Crustacea

Crabs, lobsters, shrimps and prawns were notable for their small numbers and low diversity at all sites.

Molluscs

Only limited numbers of molluscs were recorded. However they contain 4 new species for Alderney. They are all widespread species and in three cases somewhat seasonal in occurrence. They were the moon snail *Euspira catena* (S of Rubbish Tip), sea hare *Aplysia punctata* (Longis Bay), fried egg sea slug *Diaphorodoris luteocincta* (Queslingue, La Tchue & S of Rubbish Tip), and sea slug *Crimora papillata* (Queslingue).

Bryozoans
A limited variety of bryozoans were recorded none of which were new for Alderney.

Starfish, urchins and sea cucumbers
As in previous surveys in Alderney, echinoderms were not numerous. However there were five new species for the area all of which were both rare in occurrence and are widely distributed in Britain and Ireland. They were seven armed starfish *Luidia ciliaris* (Les Boufresses), common sunstar *Crossaster papposus* (Rousset), common starfish *Asterias rubens* (Les Boufresses), common sand brittlestar *Ophiura ophiura* (South of Rubbish Tip) and gravel sea cucumber *Neopentadactyla mixta* (La Tchue).

Sea squirts
No new sea squirts were recorded for the area. As on previous surveys the most common species were the orange sea squirt *Stolonica socialis,* and two club sea squirts *Aplidium punctum* and *Morchellium argus.*

Fishes
The were notably few fishes recorded, possibly due to the relatively early time of year with consequent coldish water and limited visibility. Only one new species for Alderney from our surveys was recorded, the widespread lesser-spotted catshark *Scyliorhinus canicula* (Les Boufresses).

Seaweeds
The seaweeds encountered during the survey were mostly typical of this biogeographic region, with seaweeds typical of southern Britain together with others which are fairly scarce in Britain but more common on Atlantic coasts of France and the Iberian Peninsula to the south. Examples include *Haliptilon squamatum, Gracilaria bursa-pastoris*, *Gigartina teedii* and *Codium vermilara*.

A total of 107 seaweed species were recorded during the 2010 survey and although most had previously been recorded for Alderney, a total of 14 species are considered as new to the Alderney flora (i.e. not listed by Bonard, 2008 nor Wood 2007. They are:

Corallina caespitosa
Erythrodermis traillii
Gracilaria bursa-pastoris
Nitophyllum punctatum
Polysiphonia harveyi
Rhodymenia delicatula
Schmitzia neapolitana
Cordylecladia erecta
Gigartina teedii
Meredithia microphylla
Osmundea osmunda
Rhodophysema georgii
Cryptonemiales (unknown species)
Codium vermilara

It was considered by the survey's phycologist (Francis Bunker) that the Alderney seaweed flora was particularly rich and interesting with a large number of species being recorded from a small number of sites during a brief visit (and without proper microscope facilities).

Flowering plants
Eelgrass, *Zostera marina* had been identified from precious surveys in Longis and Saye Bays and inside Braye harbour. During this survey we clarified that the seagrass bed in Longis Bay does extend across the whole of the entrance to the bay. We also identified another tide-swept eelgrass bed in Frying Pan Bay.

Seagrass beds are a Biodiversity Action Plan habitat in the UK and thus of considerable significance in conservation terms. They are one of the most important features of the marine habitats around the island.

Appendix 1: Species List

Species Name	Common Name	Records from this survey							Previous records from sites in the survey area		other 2007 records	other 2008 records
		Les Boufresses	Longis Bay	Queslingue/ Frying Pan Bay	Rousset	La Tchue	South of Rubbish Tip	The Sisters	Baie du Grounard	Longis Bay	Coque Lihou		
PORIFERA	**SPONGES**												
Leucosolenia								R			FO	R	O
Gantia compressa	compressed purse sponge	O											
Leuconia gossei					R								
Scypha ciliata	purse sponge	F		O	O	O		O			CF	F	CF
Pachymatisma johnstonia	elephant hide sponge	R		O	OR	OR		O			O	O	O
Dercitus bucklandi	black tar sponge			R		R						OR	
Tethya (white sp.)												OR	
Tethya citrina	golf ball sponge	R		O	R	O					O	O	OR
Polymastia boletiformis	hedgehog sponge	F		F	F	F	O				O	FOR	FO
Polymastia penicillus (mamillaris)	chimney sponge					R	R				R	O/R	R
Adreus fascicularis		P		O		R					O	COR	O
Stelligera stuposa		R		R									
Cliona celata	boring sponge	O	R	O	R	OR		R		R		OR	O
Axinella damicornis	crumpled duster sponge	O		O	R	O				R		FR	O
Axinella dissimilis	yellow staghorn sponge	F		O	OR	F	O	O			FO	CFO	CF
Axinella infundibuliformis	prawn cracker sponge												R
Homaxinella subdola	wiry staghorn sponge				R	R						R	R
Ciocalypta penicillus	tapered chimney sponge	P										R	
Halichondria									O				
Hymeniacidon perleve										O		O	

Amphilectus (Esperiopsis) fucorum	shredded carrot sponge				P							OR	
Ulosa digitata												R	R
Hemimycale columella	crater sponge			O	R	R		O			F	OR	O
Myxilla incrustans						R						R	
Myxilla rosacea						P							
Endectyon delaubenfelsi						P							
Raspailia hispida											O		O
Raspailia ramosa	chocolate finger sponge	R		P	R	R					F	OR	FO
Tethyspira spinosa													R
Haliclona cinerea										R		R	
Haliclona fistulosa		P			O		R					R	OR
Haliclona oculata	mermaid's glove											P	
Hexadella racovitzai	purple crust	P				O							O
Dysidea fragilis	goosebump sponge	O		R	R	O		O		O		FO	O
Porifera indet crusts		P			R	O		OR	O			O	O
		16	1	13	15	19	4	8	2	6	11	26	21
CNIDARIA	**HYDROIDS, ANEMONES, CORALS, JELLYFISH**												
Haliclystus auricula												R	
Leptolida	hydroids indet				OR	F							
Tubularia indivisa	oaten pipes hydroid										SA	FA	ACF
Halecium												R	
Hydrallmania falcata	helter skelter hydroid				F								
Sertularella gayi												F	
Sertularia cupressina	squirrel's tail											R	
Nemertesia antennina	antenna hydroid											R	
Nemertesia ramosa	branched antenna hydroid	R											
Aglaophenia		P										O	
Aglaophenia pluma												O	
Gymnangium montagui	indian feathers hydroid	R			O						O	F/O	0

Obelia geniculata	kelp fur	F		F	O	F	O			OF		OFC	F		
Alcyonium digitatum	dead men's fingers										O	OR	R		
Alcyonium glomeratum	red fingers				R	O						F/O/R	F		
Eunicella verrucosa	pink sea fan			R	R						R	O/R	O		
Cerianthus lloydii	burrowing anemone		O			O	R			F/O		R			
Parazoanthus axinellae	yellow cluster anemone				P	F						F	FO		
Isozoanthus sulcatus	peppercorn anemone					R						R	O		
Actinia equina	beadlet anemone		OR			R	R		F			CFO			
Actinia fragacea	strawberry anemone											F			
Anemonia viridis	snakelocks anemone								O	O		FOR			
Urticina felina	dahlia anemone					OR	R		R						
Aulactinia verrucosa	gem anemone								F			R			
Aiptasia mutabilis	trumpet anemone											O			
Cereus pedunculatus	daisy anemone		R				O		F	FO		O			
Actinothoe sphyrodeta	white striped anemone	O		O	F	R		O			O	COR	OR		
Sagartia elegans	elegant anemone										F				
Sagartia troglodytes						O	R								
Peachia cylindrica			R					R							
Corynactis viridis	jewel anemone				O	P					F	AFOR	O		
Caryophyllia smithii	Devonshire cup-coral	R	C	F	FR	F		R		O	F	COR	FO		
Balanophyllia regia	scarlet and gold cup-coral					O						F			
		6	5	4	10	13	6	3	5	5	8	26	11		
PLATYHELMINITHES	**FLATWORMS**														
Prostheceraeus vittatus	candy striped flatworm									R		R			
		0	0	0	0	0	0	0	0	1	0	1	0		
ANNELIDA	**SEGMENTED WORMS**														
Polychaeta	tube worms indet.									C		S			
Chaetopterus variopedatus												R			
Arenicola marina	lugworm		F							O		COF			

Lanice conchilega	sand mason worm		OR			O	O			O		OR	
Bispira volutacornis	double spiral worm	O			OR	O						OR	
Megalomma vesiculosum			R										
Sabella pavonina	peacock worm						R						
Filograna implexa	coral worm											F	
		1	3	0	1	2	2	0	0	3	1	6	0
CRUSTACEA	**CRABS, LOBSTERS, SHRIMPS AND PRAWNS**												
Balanomorpha	barnacles							F	O			F	
Boscia anglica	cup-coral barnacle											R	
Mysidae									O			O	
Isopoda	parasitic isopod (on fishes)											O	
Palaemonidae	shrimps/prawns		R										
Homarus gammarus	lobster											R	
Paguridae indet	hermit crabs		O										
Pagurus bernhardus	common hermit crab		O			O	O			R		R	
Galathea	squat lobsters											R	
Galathea strigosa	spiny squat lobster											R	
Porcellana platycheles	porcelain crab											O	
Maja squinado	spiny spider crab							R				OR	R
Inachus	spindly spider crab											R	
Cancer pagurus	edible crab					P		R				OR	R
Necora puber	velvet swimming crab					P		R				OR	
Carcinus maenas	shore crab											OR	
		0	3	0	0	3	1	4	2	1	0	15	2
MOLLUSCA													
Acanthochitona fascicularis												R	
Haliotis tuberculata	ormer											R	
Gibbula	topshells			F		R							
Gibbula cineraria	grey topshell											FOR	

Gibbula umbilicalis	flat topshell								O	O		CO			
Osilinus lineatus												C			
Calliostoma zizyphinum	painted topshell					OR	O				O	O		O	
Patella	limpets									O					
Patella vulgata	common limpet								F			CO			
Helcion pellucidum	blue rayed limpet	R								R		CF			
Littorina obtusata												O			
Trivia	cowries	R				R				O		R			
Trivia arctica	arctic cowrie				R							O		OR	
Trivia monacha	european cowrie								R						
Euspira catena	moon shell						R								
Ocenebra erinacea	sting winkle										R	R			
Nucella lapillus	dog whelk											R			
Hinia reticulata	netted dog whelk		FO	O		OR	F		R	OR		OR			
Elysia viridis	green sea hare											R			
Aplysia punctata	sea hare		FR												
Tritonia nilsodhneri	san fan sea slug											R		R	
Diaphorodoris luteocincta	fried egg sea slug			R		O	O								
Crimora papillata				O											
Polycera faeroensis	yellow edged polycera	R			O	O					R	R		R	
Cadlina laevis												R		R	
Coryphella										R					
Coryphella browni				P						O		O			
Pecten maximus	king scallop											R			
Ensis	razor shell		P							R					
Sepia officinalis	cuttlefish											R			
Loliginidae	squid											R			
		3	3	5	2	6	4	0	4	8	3	21		5	
BRYOZOA	**SEA MATS AND SEA MOSSES**														
Crisia	white claw sea moss									A		CF		P	
Alcyonidium diaphanum	finger bryozoan	O					O					OR			
Amathia lendigera												R			

Aetea anguina												P		
Membranipora membranacea	sea mat		O	F	O	FO	O					FO	F	
Electra pilosa	frosty sea mat				O	O		F				F		
Flustra foliacea	hornwrack				R						R	CFR		
Bugula	spiral bryozoans											CR		
Bugula flabellata				O	O	O			C			FO	O	
Bugula plumosa				O		O	O	O			F	ACFO	F	
Bugula turbinata									O					
Scrupocellaria												O		
Cellaria						O	F					FO		
Pentapora foliacea	potato crisp bryozoan					R						OR		
Bryozoa indet crusts		O		O	R			O	F		F	FO	O	
		2	1	4	5	6	4	3	2	2	3	14	5	
PHORONIDA	**HORSESHOE WORMS**													
Phoronis hippocrepia	horsehoe worm											FO		
		0	0	0	0	0	0	0	0	0	0	1	0	
ECHINODERMATA	**STARFISH, SEA URCHINS & SEA CUCUMBERS**													
Luidia ciliaris	seven armed starfish	R											R	
Asterina gibbosa	cushion star				R			R			O	FOR	R	
Crossaster papposus	common sunstar				P									
Henricia oculata	bloody henry											R	R	
Asterias rubens	common starfish	R												
Marthasterias glacialis	spiny starfish	R		R	R	R						OR	O	
Amphipholis squamata									P					
Ophiura ophiura	common sand brittlestar						R							
Echinus esculentus	common sea urchin											R		
Neopentadactyla mixta	gravel sea cucumber					R								
Pawsonia saxicola	white crevice sea cucumber	O						R				R		
Aslia lefevrei	brown crevice sea cucumber	O		O	R	OR						R		
		5	0	2	4	3	1	2	1	0	0	6	4	

TUNICATA	**SEA SQUIRTS**													
Clavelina lepadiformis	light bulb sea squirt				R	R		R	P	O		CR	R	
Pycnoclavella aurilucens	sparkling sea squirt											F		
Polyclinum aurantium												OF		
Morchellium argus	four spotted sea squirt	F		O	P	OR		O	F	O		FOR	O	
Sidnyum elegans												OR		
Sidnyum turbinatum									O			O		
Aplidium punctum	club head sea squirt	F	O	O	F	FOR		FR				FO		
Didemnidae									O	O		FO		
Diplosoma												R		
Lissoclinum perforatum	white perforated sea squirt											O	R	
Ascidiella aspersa					P	R						C		
Ascidia mentula	red sea squirt			F		O					O	OR	O	
Ascidia virginea	pink edged sea squirt		O			R						P		
Stolonica socialis	orange sea squirt	O		C	CF	CO		O		F	C	ACFO	C	
Botryllus schlosseri	star sea squirt								O			R		
Molgula												C		
		3	2	4	5	7	0	4	5	4	2	16	5	
PISCES	**FISHES**													
Scyliorhinus canicula	lesser spotted catshark	R												
Galeorhinus galeus	tope												R	
Raja clavata	thornback ray											R		
Conger conger	conger eel											R		
Pollachius pollachius	pollack			R		OR				OO		CFO	CO	
Trisopterus luscus	bib		R									OR		
Trisopterus minutus	poor cod											R		
Dicentrarchus labrax	bass									O		FO		
Mullus surmuletus	red mullet											R		
Mugilidae	grey mullet											R		
Labridae	wrasse											OR		
Centrolabrus exoletus	rock cook									R	O	OR		
Crenilabrus melops	corkwing wrasse					R						CFOR	R	

Ctenolabrus rupestris	goldsinny										O	FOR	O	
Labrus bergylta	ballan wrasse	O	R	O	R	OR			O	FO	O	CFO	O	
Labrus mixtus	cockoo wrasse					R					O	OR	R	
Lipophrys pholis	shanny											O		
Parablennius gattorugine	tompot blenny					R		R				OR		
Tripterygion delaisi	black face blenny			P		R						O		
Ammodytes tobianus	lesser sand eel											ACFO		
Callionymus lyra	dragonet		O	O						O		FR		
Gobius cobitis	giant goby											R		
Gobius paganellus	rock goby											R		
Gobiusculus flavescens	two spot goby	R	OR	O	O	O			C	AC		ACFO		
Pomatoschistus	small gobies									CO		CO		
Thorogobius ephippiatus	leopard spotted goby							R				OR		
Zeugopterus punctatus	topknot								R			R		
		3	4	5	2	7	0	2	3	7	4	25	6	
RHODOPHYCOTA	**RED SEAWEEDS**													
Rhodophycota	red seaweeds indet.			CF				A		C	C	ACF	F	
Porphyra									O			O		
Porphyra umbilicalis	purple laver			R								O		
Scinaia					R							R		
Asparagopsis armata			R			R	R		O	FO		ACFOR		
Bonnemaisonia												OR		
Bonnemaisonia asparargoides			R		R	R		R						
Bonnemaisonia hamifera			F			R						R		
Gelidium								R	O					
Gelidium pusillum												F		
Palmaria palmata	dulse	R							O	F		FO		
Rhodophysema georgii			R											
Rhodothamniella floridula		R	O		R	O		R	O			F		
Ahnfeltia plicata	wire weed		R									OF		
Corallinales	pink encrusting algae	COR	R	O	R	FR		O	A	C	O	CFO	F	
Corallina officinalis	coral weed			O	R	R			F			CFO		

Lithophyllum incrustans											C	
Mesophyllum lichenoides	pink plate algae									O	FO	
Haliptilon squamatum								R				
Grateloupia filicina				R								
Schmitzia neapolitana		R										
Calliblepharis ciliata	red fringe weed				R	R		F			FR	
Calliblepharis jubata										O	O	
Cystoclonium purpureum										F	O	
Rhodophyllis									O			
Rhodophyllis divaricata				OR	R					F	FO	
Dilsea carnosa	red rags				R	R	O	FO		O	CFOR	
Furcellaria lumbricalis			R	R	R				F	C	CF	
Halarachnion ligulatum					R	R		R			O	
Chondracanthus acicularis									O	C	FO	
Chondracanthus teedei				R								
Chondrus crispus	carragheen		FO						F	F	CFOR	
Callophyllis laciniata		R	O	R	R	OR			R	O	CFOR	
Kallymenia sp.		R			R							
Kallymenia reniformis		R		R	OR	R					FO	
Meredithia microphylla		R		O	OR	FR		O		O	FOR	
Peyssonnelia					R							
Erythrodermis traillii						R						
Gymnogongrus crenulatus										F	O	
Mastocarpus stellatus									F	O	CF	
Phyllophora crispa		R	R	R	R	R					FOR	
Phyllophora pseudoceranoides		R									O	
Phyllophora sicula		R			R	R					R	
Schottera nicaeensis		R			R	R					O	
Stenogramme interrupta		R			R	R					F	
Schizymenia dubyi										R		
Sphaerococcus coronopifolius		R		R	R					F	F	
Gracilaria										CO	O	
Gracilaria bursa-pastoris			R									

Graciaria gracilis			R								
Plocamium cartilagineum	red comb weed	R	R	R	R	R			O	FO	
Chylocladia verticillata									R	OR	
Gastroclonium ovatum			R	R				F	F	FO	
Lomentaria articulata				R	R					FO	
Lomentaria clavellosa						R	R			R	
Cordylecladia erecta		R			R	R					
Rhodymenia delicatula		R									
Rhodymenia holmesii										O	
Aglaothamnion										O	
Aglaothamnion byssoides			R	R							
Rhodymenia pseudopalmata					R	F					
Callithamnion tetricum										O	
Ceramium									FO	F	
Ceramium echionotum			R								
Ceramium secundatum				R				F	F	FO	
Griffithsia corallinoides			R							OR	
Halurus equisetifolius	sea mare's tail			R				R		OR	
Halurus flosculosus				R						R	
Pleonosporium borreri				R							
Plumaria plumosa				O							
Pterothamnion plumula		R			R	R	R			O	
Spermothamnion repens					R						
Spermothamnion strictum					R		R				
Sphondylothamnion multifidum		R				R			C	CFO	
Dasya hutchinsiae				R							
Heterosiphonia										R	
Heterosiphonia plumosa		R		R	F	FR			F	CFO	
Acrosorium venulosum		R		O	R	CO				CFOR	
Apoglossum ruscifolium										R	
Cryptopleura ramosa		R	O	O	R	FR	R	P	F	CFO	
Delesseria sanguinea	sea beech	FR		R	CR	R				FO	
Drachiella heterocarpa		R								O	

Drachiella spectabilis	rainbow weed	R	O		R	R						C		
Erythroglossum laciniatum		R				R								
Haraldiophyllum bonnemaisonii			R			R								
Hypoglossum hypoglossoides		R			R	R		R				OR		
Membranoptera alata		R		O								O		
Nitophyllum punctatum				R										
Phycodrys rubens	sea oak	R		O		F						F		
Polyneura bonnemaisonii												FOR		
Brongniartella byssoides				R	R	R		F				F		
Chondria dasyphylla												O		
Laurencia									O	F		FO		
Osmundea osmunda				R										
Polysiphonia				R										
Polysiphonia brodiei												O		
Polysiphonia harveyi								R						
Polysiphonia nigra					R							P		
Polysiphonia stricta								R						
Pterosiphonia parasitica					R									
Rhodomela confervoides												O		
		29	21	33	36	33	2	18	18	28	2	69	2	
PHAEOPHYCEAE	**BROWN SEAWEEDS**													
Phaeophyceae	brown seaweeds indet		ACO	C		O						C		
Ectocarpus	maiden's hair											F		
Colpomenia peregrina			OR							R		O		
Chordaria flagelliformis			R											
Stilophora tenella												F		
Cladostephus spongiosus		R			R				O			O		
Sphacelaria		R			R	R								
Halopteris filicina				R	R	R		R				OR		
Dictyopteris membranacea	midrib fan weed	O			R	R						FOR	O	
Dictyota dichotoma	brown fan weed	O		FR	R	FR	O	F		O		CFO		
Padina pavonica	peacock's tail									O				

Taonia atomaria												R	
Carpomitra costata						R						R	
Sporochnus pedunculatus												O	
Arthrocladia villosa												F	
Desmarestia aculeata	landlady's wig											FO	
Desmarestia ligulata	mermaids hair	R	R					OR	O	O		OR	
Desmarestia viridis			R		R			O					
Alaria esculenta	dabberlocks											OR	
Chorda filum	mermaid's tresses		O									O	
Laminaria digitata	oar weed									F		FO	
Laminaria hyperborea	cuvie	SA	ACR	CFR	AC	AFO	AF	AF	F	C	C	ACFOR	AC
Laminaria ochroleuca	golden kelp		CFR	SFO	AF	ACF	AF	AF		F		ACFO	F
Laminaria saccharina	sugar kelp		OR	R								CFO	
Saccorhiza polyschides	furbelows	FR	O	FO	R		O	CF	O	C		ACFO	
Bifurcaria bifurcata										F		FOR	
Cystoseira										CF		FOR	
Cystoseira baccata			O										
Cystoseira tamariscifolia												R	
Halidrys siliquosa	podweed	CF			FR	R	F					CFOR	
Fucus serratus	serrated wrack								C	FO		AO	
Fucus vesiculosus												A	
Pelvetia canaliculata												C	
Himanthalia elongata	thongweed	P	F	FR					F	F		CFR	
Sargassum muticum	japweed		FO						R	FO		FOR	
		9	13	8	10	9	5	7	7	13	1	30	3
CHLOROPHYCEAE	**GREEN SEAWEEDS**												
Chlorophyceae	green seaweeds indet.											C	
Enteromorpha									C	O		ACF	
Ulva	sea lettuce		R	R				R	F	O		ACFO	
Chaetomorpha aerea		R			R								
Chaetomorpha melagonium				R									
Cladophora			R			R			O			O	

Cladophora lehmanniana								R					
Cladophora pellucida				R				R					
Cladophora rupestris												FO	
Bryopsis plumosa	henpen	R				R			R				
Codium				R									
Codium tomentosum	velvet horn								O	F		FO	
Codium vermilara			R		R								
		2	3	4	2	2	0	3	5	3	0	6	0
ANGIOSPERMAE	**FLOWERING PLANTS**												
Zostera marina	eelgrass		AO	A						ACO		OR	
		0	1	1	0	0	0	0	0	1	0	1	0
TOTAL ANIMAL SPECIES		39	22	37	44	66	22	26	24	37	33	157	59
TOTAL PLANT SPECIES		40	38	40	48	44	7	28	30	45	3	105	5
TOTAL SPECIES		79	60	77	92	110	29	54	54	82	36	262	64

Appendix 2 JNCC biotopes identified

Littoral rock biotope

LR.HLR.FR.	Robust fucoid and/or red seaweed communities (Queslingue)

Infralittoral rock biotopes

IR.FIR.SG	Infralittoral surge gullies and caves (The Sisters)
IR.HIR.KFaR.LhypR.Loch	Mixed *Laminaria hyperborea* and *Laminaria ochroleuca* forest on exposed infralittoral rock, (Les Boufresses, Rousset, La Tchue, The Sisters)
IR.HIR.KFaR.LhypRVt	*Laminaria hyperborea* and red seaweeds on exposed vertical rock (Rousset)
IR.LIR	Low energy infralittoral rock (Longis Bay)
IR.LIR.K.LhypLoch	Mixed *Laminaria hyperborea* and *Laminaria ochroleuca* forest on moderately exposed or sheltered infralittoral rock, (Longis Bay, Queslingue, Frying Pan Bay, Rousset, La Tchue, South of Rubbish Tip)
IR.MIR.KR.Lhyp.Ft	*Laminaria hyperborea* forest and foliose red seaweeds on moderately exposed upper infralittoral rock (Queslingue)
IR.MIR.KR.LhypT	*Laminaria hyperborea* park and foliose red seaweeds on tide-swept lower infralittoral mixed substrata (Frying Pan Bay)
IR.MIR.KR.LhypTX.Pk	*Laminaria hyperborea* park and foliose red seaweeds on tide-swept lower infralittoral mixed substrata (Les Boufresses)

Sublittoral sediment biotopes

SS.SMp.SSgr.Zmar	*Zostera marina/angustifolia* beds on lower shore or infralittoral clean or muddy sand, (Longis Bay, Frying Pan Bay)
SS.SSa.IFiSa.IMoSa	infralittoral mobile clean sand with sparse fauna, (La Tchue, South of Rubbish Tip)
SS.SSa.IMuSa.AreISa	*Arenicola marina* in infralittoral fine sand or muddy sand (Longis Bay)

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