



COLL 2003 SURVEY

Report of a SEASEARCH survey around Coll, Argyll

June 7th - 14th 2003

Sue Scott

July 2004

SURVEY TEAM

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Calum Duncan recording in kelp forest
on the north coast of Coll

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CONTENTS

SYNOPSIS.....	iii
1. INTRODUCTION.....	1
1.1. Background to survey.....	1
1.2. Seasearch.....	1
1.3. Previous diving surveys.....	1
2. METHODS.....	2
2.1. Survey facilities.....	2
2.2. Site selection.....	2
2.3. Survey methods.....	2
2.4. Position fixing.....	3
2.5. Data analysis.....	3
3. RESULTS & DISCUSSION.....	4
3.1. Location of results.....	4
3.2. Sites and habitats.....	4
3.2.1. North-west coast.....	4
3.2.2. Sgeir Bousd.....	7
3.2.3. SS Nevada.....	9
3.2.4. North Channel.....	11
3.2.5. Sùil Ghorm.....	13
3.2.6. Cairns of Coll.....	15
3.2.7. North-east coast.....	17
3.2.8. Airne na Sgeire.....	19
3.2.9. Calmac Jetty.....	21
3.3. Species.....	23
4. REFERENCES.....	25
5. ACKNOWLEDGEMENTS.....	25
Figure 1. Location of survey sites.....	26
APPENDIX I	List of sites surveyed
APPENDIX II	Main features of sites surveyed
APPENDIX III	Species recorded by the survey
APPENDIX IV	Examples of completed recording forms
APPENDIX V	Raw data sheets (separate cover)
APPENDIX VI	Catalogue of photographs (separate cover)

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SYNOPSIS

Seasearch is a programme of Phase 1 marine biological surveys, developed by the Marine Conservation Society and the Joint Nature Conservation Committee to give sports divers an opportunity to participate in marine biological surveys, and to contribute to the information from an area by recording habitats and species.

The surveyors were 12 divers from various sub-aqua clubs, or independent, between June 7th-14th 2003. Seasearch recording forms were completed for 33 sites, concentrating on the previously unsurveyed north west coast. Sites were also dived around the north east end of Coll, and the east coast near Arinagour, both found to be interesting areas on previous trips. Site and species lists and a catalogue of photographs have been compiled.

The range of habitats and species recorded reflects the different wave and current exposure of the east and west coasts, and the presence of deep water close to the east coast. The underlying geology of hard Lewisian gneiss provided further habitats in cracks and crevices, as well as some larger clefts in the rock making spectacular swim-throughs. On the wave-exposed west coast, sites were typically steep slopes of bedrock and boulders, ending in clean, coarse sediments at the base. In shallow water kelp forests and abundant smaller algae covered rocks, with patches of jewel and elegant anemones on vertical faces. The black cotton spinner sea cucumber *Holothuria forskali*, near its northern limit of distribution in Britain, was recorded at most sites. In deeper water, boulders were much barer with scour-resistant encrusting bryozoans, cup corals and the hard erect bryozoan *Porella compressa*. However there was a good variety of fish in and around boulder holes, probably including the red blenny *Parablennius ruber*, only recently recognised from British waters. The wreck of the SS Nevada provided a further good habitat for fish.

Most sediments on the exposed west coast were clean and mobile, with species typical of this habitat, including the marbled crab *Liocarcinus marmoreus*, sea potatoes *Echinocardium cordatum*, dragonet *Callionymus lyra*, scallops, 7-armed starfish *Luidia ciliaris*, sand star *Astropecten irregularis* and necklace shell *Euspira catena*.

At the north end of the island, sites around the Cairns of Coll were extremely current-swept and scenic, with a large proportion of colourful animals including jewel, elegant and plumose anemones, the anemone *Actinothoe sphyrodeta*, sponges, bloody Henry starfish, the northern starfish *Leptasterias muelleri*, sea firs and featherstars, with nudibranchs preying on other animals. Around the lighthouse on Sùil Ghorm, clean shell gravel had many tiny dragonets and prawns and a few fragments of maerl, while rocks affected by sand supported erect bryozoans and typical algae. The shallow, current-swept channel between Eilean Mór and Eag na Maoile was an exceptionally rich place for seaweeds, with 43 species recorded.

By contrast, east coast sites, clustered around the entrance to the harbour at Arinagour, were relatively sheltered from waves but still experienced strong tidal streams, especially in deeper water. Below the kelp-covered rock slopes, boulders at 15-20m were covered with an abundance of fixed filter feeders, including soft corals, plumose anemones, sea firs, sponges and sea mats, with wrasse and (rarely) lobsters in boulder holes. At Airne na Sgeire, mixed sediments with scattered stones in deeper water had an interesting fauna including the southern anemone *Hormathia coronata* and daisy anemone *Cereus pedunculatus*, colonial anemone *Epizoanthus couchii*, and cotton spinner sea cucumber. Underwater pilings of the Calmac Jetty at Arinagour are richly colonised with soft corals, anemones and other life.

Other interesting species recorded on the survey include the rarely recorded nudibranchs *Okenia aspersa* and *Lomanotus genei*, ovulid gastropod *Simnia patula*, pencil sponge *Ciocalyptra penicillus*, sting wrinkle *Ocenebra erinacea*, bright orange starfish *Stichastrella rosea*, and the potato crisp bryozoan *Pentapora foliacea*.

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1. INTRODUCTION

1.1. Background to survey

From previous trips to Coll, Lothian Divers Sub-Aqua Club (LDSAC) had identified the island as being particularly interesting for marine life, with a variety of habitats and many southern species at or near their limits of distribution in Britain. Prior to this survey there was little recorded marine biological information for the area, and this Seasearch survey was carried out to add to the knowledge of the underwater sites, habitats and species. The survey was planned to record information from known sites of interest, as well as to look at previously unsurveyed areas, particularly on the north coast.

1.2. Seasearch

Seasearch is a project for volunteer sports divers and others to record useful and accurate observations of underwater habitats and the life they support, thus contributing to the knowledge and understanding of the marine ecology of Britain. The underwater life and scenery of Britain is still little known, even by 'experts', so divers who see the marine life at first hand can contribute invaluable information. Seasearch aims to capture this information by recording it on structured forms, which are designed to fit a level of expertise to suit the diver. The aim is both to increase the knowledge and therefore the enjoyment of divers, and to contribute useful information to add to the pool of knowledge of an area.

Seasearch was established by the Marine Conservation Society and the Joint Nature Conservation Committee (JNCC) in the mid-80s. A national Seasearch steering group (NSSG) was established in 1999 to further develop the potential of the project. The NSSG members include statutory conservation bodies (Scottish Natural Heritage, English Nature, Countryside Council for Wales and JNCC), the Environment Agency, NGOs (Marine Conservation Society and the Wildlife Trusts), the Marine Biological Association (MarLIN), diver training organisations (BSAC, SSAC, PADI and SAA), the Nautical Archaeology Society and independent marine life experts. A starter pack is available giving more detail on Seasearch and how the surveys are planned and carried out (Scottish Natural Heritage 1995), although the forms in the original pack have been superseded by the Seasearch Observer and Surveyor forms developed by the NSSG.

1.3. Previous diving surveys

Barne et al (1997) summarise the information sources for surveys in south west Scotland, together with important locations and marine communities. The only major sublittoral survey to include Coll was an early Nature Conservancy Council survey (Dipper 1981) which concentrated on Tiree but included a number of sites on the south east coast of Coll. The survey found the large cerianthid anemone *Arachnanthus sarsi* for the first time in Britain; it has since been found at several other locations on the west coast of Scotland. However the survey reported little else of interest from Coll, the south east coast being predominantly coarse clean mobile sediments.

Recent diving trips to Coll organised by LDSAC have identified many sites and species of interest, particularly on the east and north-east coasts, and around the Cairns of Coll. This stimulated the club to run this Seasearch survey, to add to the database of species and habitats around Coll.

2. METHODS

2.1. Survey facilities

The Seasearch survey was based in a cottage and flat in Arinagour, on the east side of Coll, and inside the only sheltered harbour on Coll.

Two rigid inflatable boats (RIBs) were used for diving; the Lothian Divers' *Safina*, and Paul and Chris Turkentine's *Osprey*. Use of two landrovers owned by members of the diving team allowed launching across the beach at Bousd, a narrow rocky inlet on the north west coast, as well as in the harbour at Arinagour. Diving cylinders were filled by Steve Dickison.

Most of the team had previous experience of Seasearch, and three were professional marine biologists.



Launching boats at Bousd, north- west Coll. [Photo no. 03.46.10. S Scott]

2.2. Site selection

Sites were selected from knowledge from previous diving trips, information from local diver Steve Dickison, and Admiralty charts. In view of the exposed nature of the coast, surveying over the five days was inevitably modified by weather conditions and strong tidal streams, particularly at the Cairns of Coll. However winds from the east and south allowed diving on the often inaccessible west and north coasts.

2.3. Survey methods

On arrival at dive sites, divers worked in pairs, or occasionally as a threesome, generally working from the deepest depth upwards according to safe diving practices, and to allow maximum working time in shallow water. After descending to the deepest depth of the dive, divers began recording main habitat features and prominent species, using underwater writing boards (see front cover). Ascending up the slope in a predetermined direction, usually directly towards the shore, they stopped to describe different habitats, noting the depth at which these changed. Species were recorded according to the diver's capabilities. The information was later transferred to Seasearch recording forms (Appendices IV & V). Seasearch surveys are

now tiered into two levels. Observer level requires the completion of a simple form which focusses on seabed cover types, while Surveyor level records habitats and species in more detail on more structured forms.

Specimens were not collected, as logistics on this survey did not allow time for identification. However biologists on the survey were able to assist with identifying specimens in the field. Underwater photographs were taken by 3 survey members (Rohan Holt, Sue Scott, and Paul Turkentine).



Jewel anemones *Corynactis viridis*, an easily recognised species common on Coll

[Photo no. 03.53.29 S.Scott]

2.4. Position fixing

Most positions were taken by GPS on the RIBs. The position for Site 33 was taken from Admiralty charts.

2.5. Data analysis

After the survey, data from the recording forms was entered into Marine Recorder, which generated 'event' tables, from which site and species lists were extracted. Additional species identified from photographs were added to the species lists.

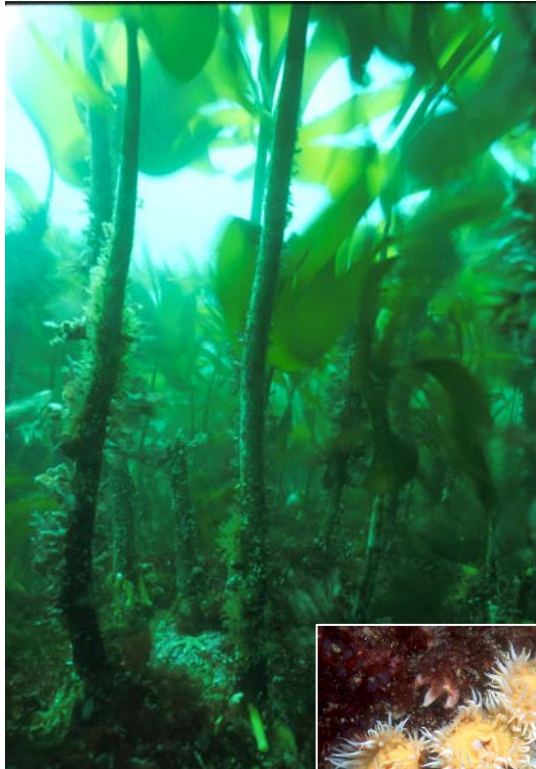
3. RESULTS & DISCUSSION

3.1. Location of results

Recording forms were completed for 33 sites. Site locations are marked on Figure 1 and listed in Appendix I, and a brief description of the main features of each site is given in Appendix II. The species identified on the survey are listed in Appendix III. A list of photographs taken on the survey by the author is given in Appendix VI.

3.2. Sites and habitats

3.2.1. North-west Coast



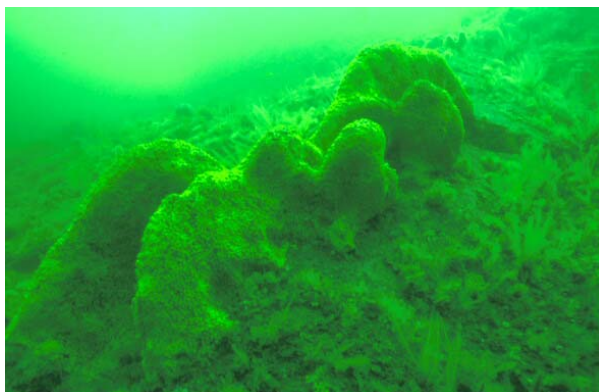
The two groups of sites 22-25 and 26-28 were all very similar, being exposed rocky offshore reefs reaching a seabed of clean, coarse sediments at around 30m. In shallow water, rugged rock slopes were covered with curvilinear kelp (*Laminaria hyperborea*) forest, with abundant red algae on stipes and rock beneath, obviously thriving on this exposed coast. Patches of jewel anemones *Corynactis viridis* and elegant anemones *Sagartia elegans* grew on vertical rock faces, and fissures filled with shell gravel were inhabited by dahlia anemones *Urticina felina*.

Dense kelp forest at Site 26. Inset: red algae and elegant anemones beneath kelp. Below: jewel and elegant anemones on vertical rock in kelp forest.

[Photo nos. .03.59.12, 03.58.20, 03.58.17. S Scott]



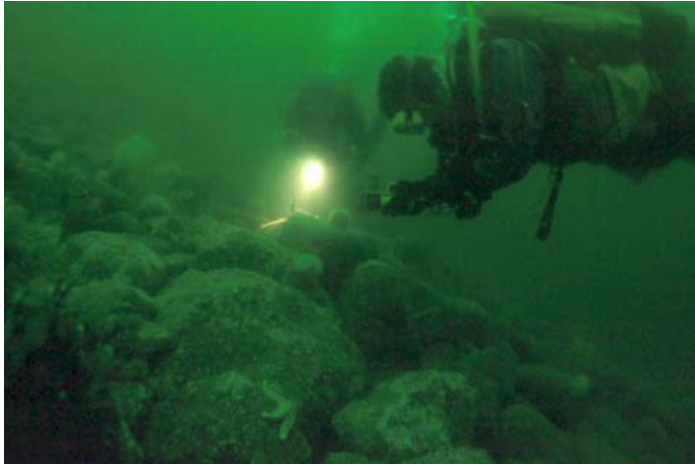
Kelp thinned out between 15-20m, and below this, rock and boulder slopes had a very varied fauna of dense soft corals *Alcyonium digitatum*, sea fans, featherstars *Antedon bifida*, barnacles, sponges and nudibranchs, with encrusting coralline seaweeds and occasional foliose red seaweeds. The brown seaweed *Dictyota dichotoma* was particularly common at some sites. The cotton spinner sea cucumber *Holothuria forskali* was occasional on these slopes, and there were frequent large masses of the yellow boring sponge *Cliona celata*.



Massive growth of the boring sponge *Cliona celata* at Site 26

[Photo no. 03.59.02. S Scott]

Between 20-35m the seabed varied from site to site, but was basically of rock and boulder slopes, with patches of sediment at some sites. Here life appeared much sparser than at the equivalent depth on the east coast, probably reflecting increased movement of boulders during storms, scour from sediments, and increased urchin-grazing in deeper water. However the sea mat *Securiflustra securifrons*, lightbulb seasquirt *Clavellina lepadiformis*, cup coral *Caryophyllia smithii* and barnacles were all common, and the hard erect sea mat *Porella compressa* was characteristic of these deeper areas. The sea cucumber *Pawsonia saxicola* was frequent in crevices and amongst boulders, and goldsinny wrasse *Ctenolabrus rupestris*, cuckoo wrasse *Labrus mixtus*, leopard-spotted gobies *Thorogobius ephippiatus*, lemon sole *Microstomus kitt*, and conger *Conger conger* were all seen around boulder holes. At Site 24, the three-bearded rockling *Gaidropsaurus vulgaris* was seen, and probably the red blenny *Parablennius ruber* (see section 3.3). Whip amphipods were also noted at Site 24.



Urchin-grazed boulders at Site 26. Above right: the hard bryozoan *Porella compressa*; below: three-bearded rockling *Gaidropsaurus vulgaris*. [Photo Nos: 03.59.03, 03.58.03, 03.58.01. S Scott]

Below 30-35m, rock slopes ended in clean rippled shelly sand, with occasional scallops *Pecten maximus* and *Aequipecten opercularis*, 7-armed starfish *Luidia ciliaris*, the sand star *Astropecten irregularis*, burrowing anemones *Cerianthus lloydii* and dahlia anemones, and a few fish including dab *Limanda limanda* and dragonet *Callionymus lyra*. The necklace shell *Euspira catena* and its egg masses were reported from several sites.

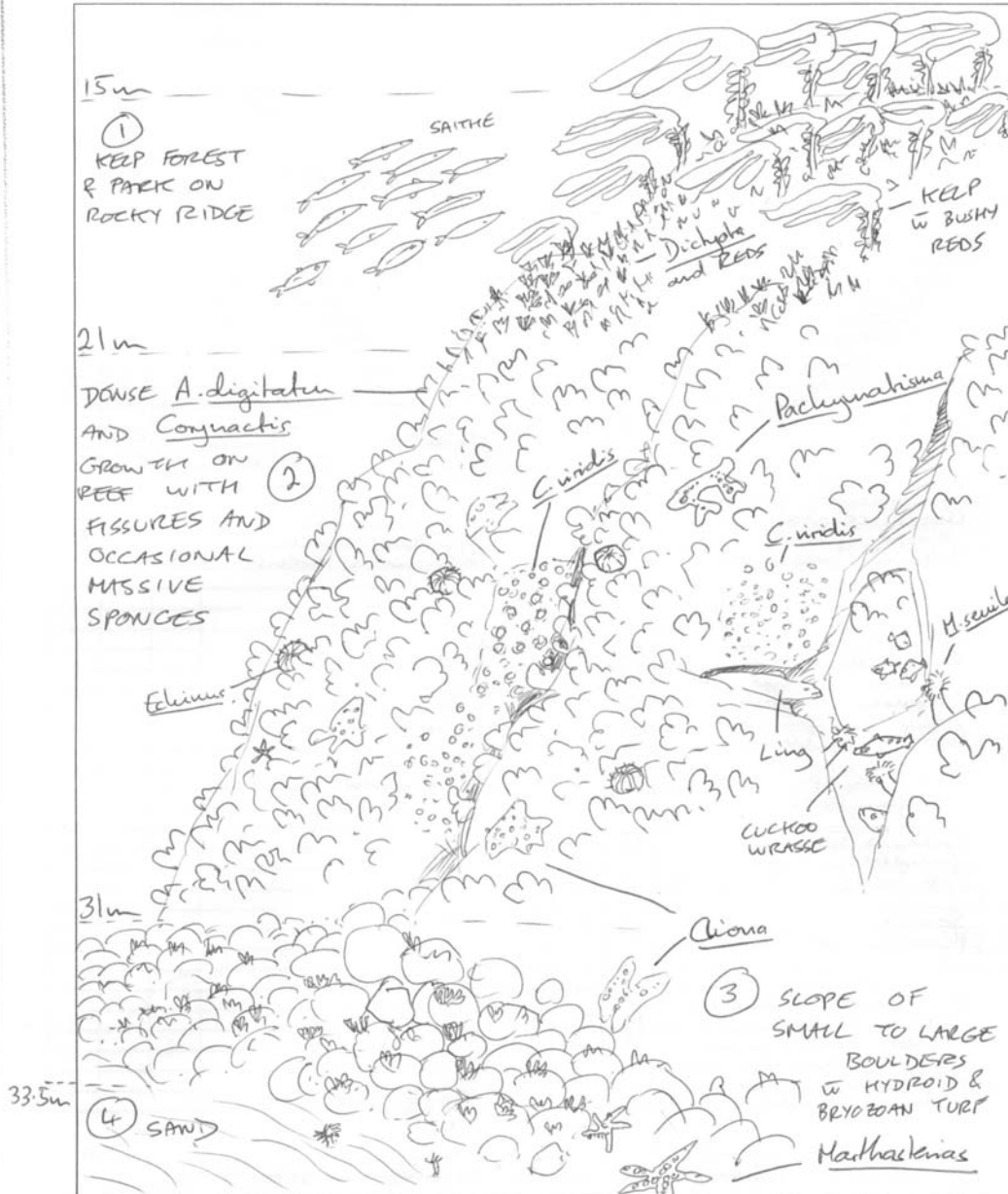


Burrowing anemone *Cerianthus lloydii* in clean shell sand [Photo no. 03.57.23. S Scott]

Eilean an Ime (Site 23) is a rocky reef split by a narrow vertical gully from near the surface to 15m, providing a spectacular swim-through, with the base filled with large boulders, as well as the occasional boulder lodged part-way down. Fewer species were recorded here than at the deeper sites further west, probably because of increased scour in shallow water, but waves of clean shelly sand at the rock base at 20-23m had numerous sea potatoes *Echinocardium cordatum*, peacock fanworms *Sabella pavonina*, and worm casts, with occasional hermit crabs and dahlia anemones.

Sketches and plans

Draw a **profile 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 your direction of travel (compass bearing) and/or the direction of any current.

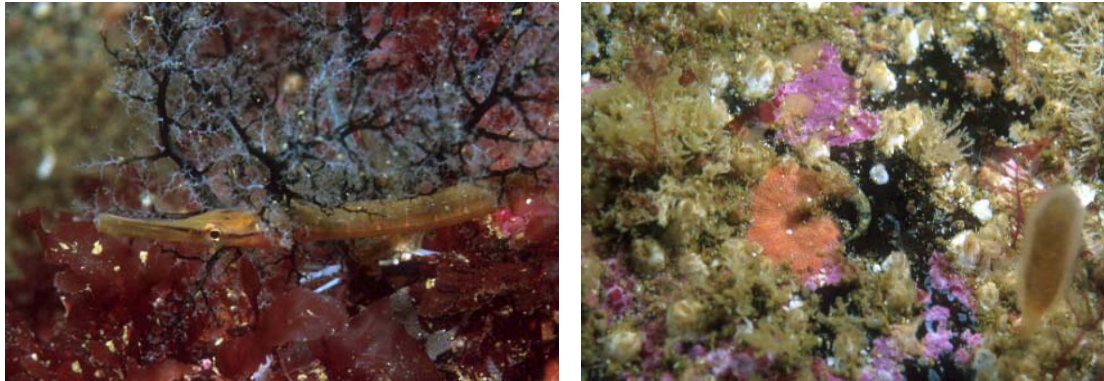


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Sketch of Site 25, NW of Eilean an Aird Heynish, north-west coast, from Seasearch form. [Calum Duncan]

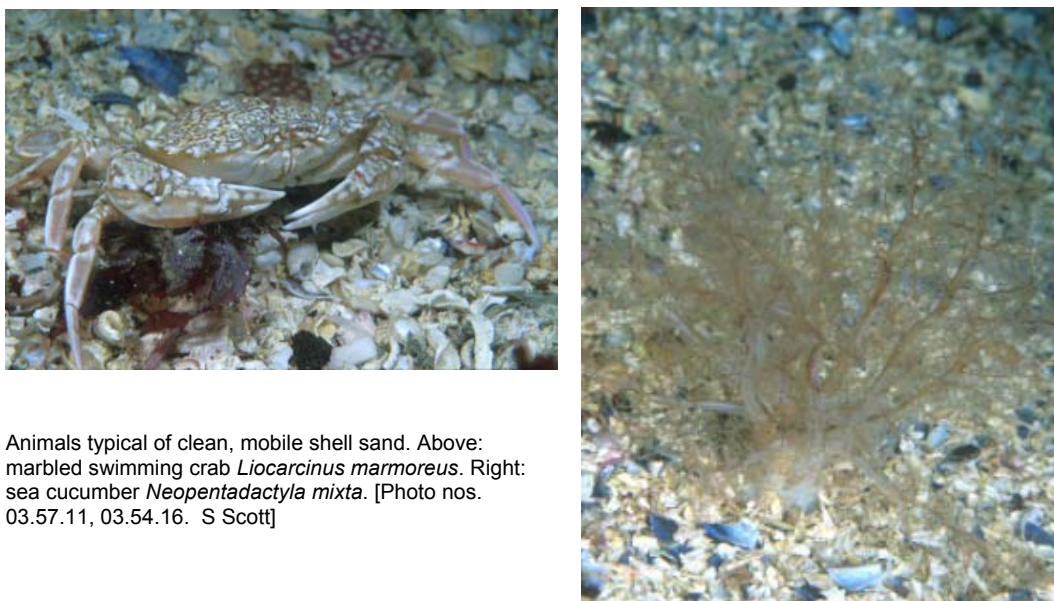
3.2.2. Sgeir Bousd

Sites 15-17 were also offshore rocky reefs, slightly less wave-exposed but more current-exposed than the offshore reefs further west. Rock slopes were covered with kelp in shallow water, with dabberlocks *Alaria esculenta*, characteristic of wave-exposed coasts, in the sublittoral fringe at Site 17. A wide range of smaller seaweeds was recorded from kelp stipes and the rock beneath, and a wide range of animals from rock slopes down to around 20m, including the rare seaslug *Okenia aspersa*, and snake pipefish *Entelurus aequoreus*. At Site 16, vertical gully walls were covered with jewel anemones, plumose anemones *Metridium senile* and soft corals. Barnacles, encrusting orange bryozoans, cup corals, lightbulb seasquirts and other scour-resistant organisms were also common.



Left: snake pipefish *Entelurus aequoreus* and sea cucumber *Pawsonia saxicola*. Right: baby dragonets *Callionymus lyra* on sand-scoured rocks, with barnacles, orange encrusting bryozoan, erect bryozoans and encrusting coralline and brown algae. [Photo Nos. 03.56.26, 03.58.07. S Scott]

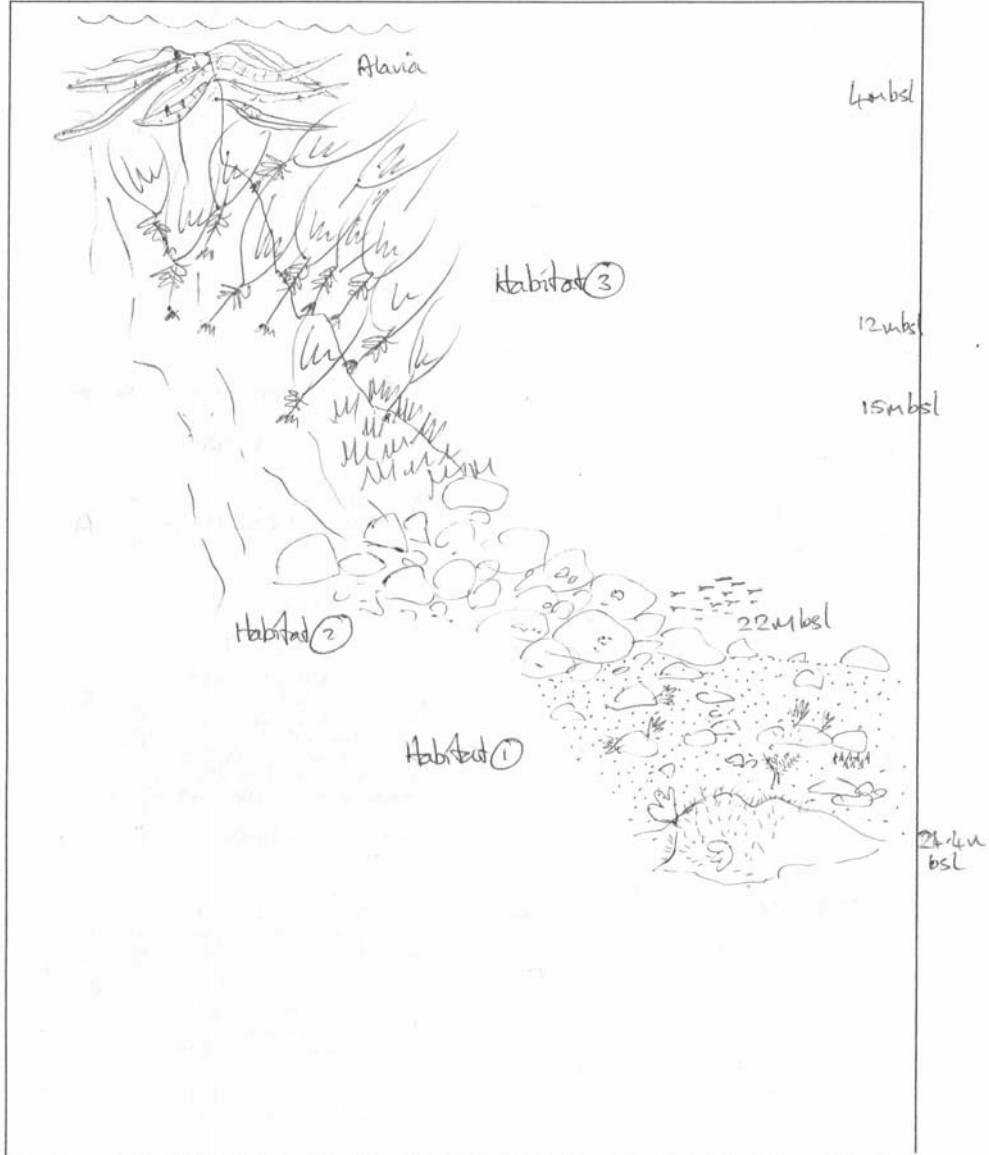
Waves and slopes of coarse shell gravel at the base of the rock at 20-23m had some interesting species, including the marbled swimming crab *Liocarcinus marmoreus*, burrowing sea cucumber *Neopentadactyla mixta*, tiny dragonets less than 2cm long and unidentified juvenile prawns. Rock outcrops, boulders and cobbles in the shell gravel had barnacles and a fuzz of fine hydroids, and a wide variety of algae typical of rocks in sand, including the sea oak *Halidrys siliquosa*, and red seaweeds *Phyllophora crispa*, *Dilsea carnosa*, *Polysiphonia nigra*, *Ptilothamnion pluma* and *Nitophyllum punctatum*. Interesting animals included the sting winkle *Ocenebra erinacea*, pencil sponge *Ciocalypa penicillus*, and small red chameleon prawns *Hippolyte varians*, well camouflaged on red seaweeds. 'Flounders' and sand eels were both recorded as abundant at Site 16.



Animals typical of clean, mobile shell sand. Above: marbled swimming crab *Liocarcinus marmoreus*. Right: sea cucumber *Neopentadactyla mixta*. [Photo nos. 03.57.11, 03.54.16. S Scott]

Sketches and plans

Draw a **profile 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 your **direction of travel** (compass bearing) and/or the **direction of any current**.



Sketch of Site 17, Outer Sgeir Bousd, from Seasearch form.
[Sue Scott]

3.2.3. SS Nevada

The wreck of the SS Nevada lies below the north side of Ruadh Mor, north-west Coll, with the upper parts against a steep rock slope at 8m, and lower part of the wreck on a mixed seabed at around 16m. The wreck is broken up, but still with some large pieces intact, providing an elevated substrate for a variety of animals and seaweeds. Luxuriant seaweeds grew on the smooth rock slope up to the shore, and included dense stands of the red seaweeds *Heterosiphonia plumosa*, *Calliblepharis ciliata* and *Dilsea carnosa*.



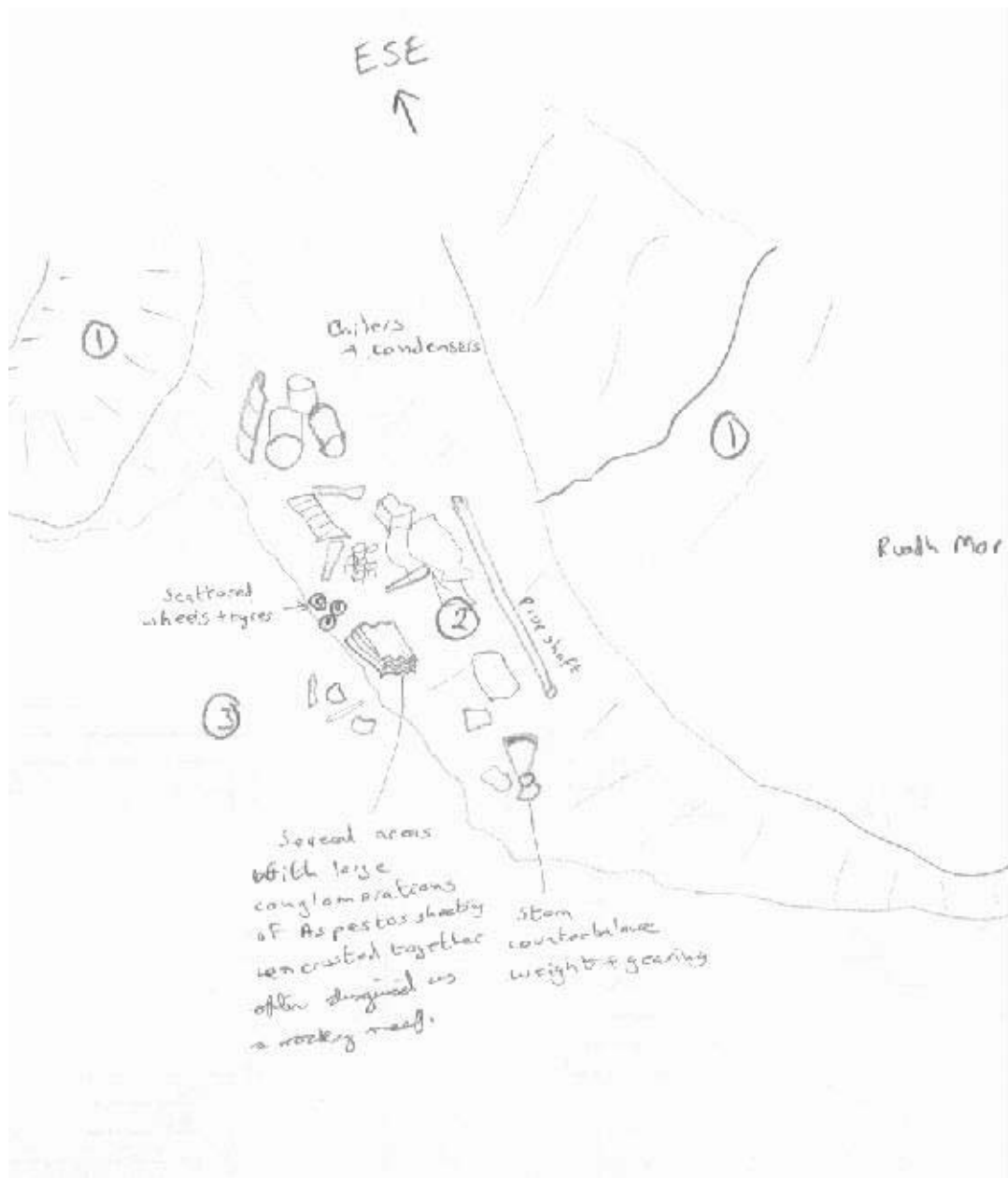
Left: Neil Cowie exploring the wreck of the SS Nevada. Below, top: Dense red algae on rock slopes next to the wreck, including *Dilsea carnosa*, *Callophyllis laciniata* and *Cryptopleura ramosa*. Below, bottom: dense red seaweeds and plumose anemones on wreck spar. [Photo nos. 00.196.01, 00.196.14, 03.56.10. S Scott]



On the elevated parts of the wreck, bushy bryozoans, soft corals, lightbulb seasquirts and elegant and plumose anemones were common, with ghost shrimps (caprellidae) festooning everything. Fish fry were very numerous around the wreck, and shoals of pollack *Pollachius pollachius* swam above. Other fish seen included cuckoo wrasse, ballan wrasse *Labrus bergylta*, goldsinny, poor cod *Trisopterus minutus*, bib *Trisopterus luscus*, ling *Molva molva*, leopard spotted goby, sand goby *Pomatoschistus minutus* and dragonet.



Life on the wreck. Left: rusty metal with barnacles and common starfish. Right: lightbulb seasquirts, elegant anemones and soft corals on elevated part of the wreck. [Photo nos. 03.56.14, 03.56.04. S Scott]



Sketch of Site 14, SS Nevada wreck, from Seasearch form.
[Neil Cowie/Mary Harvey]

3.2.4. North Channel

The current-swept channel between Eilean Mór and Eag na Maoile (Sites 29 & 30) proved an exceptionally rich site for seaweeds, with 43 species recorded from areas 5-10m deep. Many of these were attached to stones in sand, and included very large, luxuriant growths of *Ulva* sp, *Porphyra* sp, *Nitophyllum punctatum*, *Lomentaria clavellosa*, *Desmarestia ligulata*, and *Gracilaria verrucosa*. On flat bedrock outcrops there were huge furbelows kelp *Saccorhiza polyschides*, up to 4m long, and scattered sea oak *Halidrys siliquosa*, with dense foliose algae and barnacles beneath.



Algae in current-swept sandy channel, with big furbelows kelp on rocks. [Photo no. 03.60.14 S Scott]

Vertical walls at the edges of outcrops proved another distinct habitat, shaded beneath the huge kelp. Here there were abundant tube-dwelling amphipods, jewel anemones and elegant anemones, sponges *Esperiopsis fucorum* and *Leucosolenia botryoides*, lightbulb seasquirts, and the jointed coralline seaweed *Corallina officinalis*.

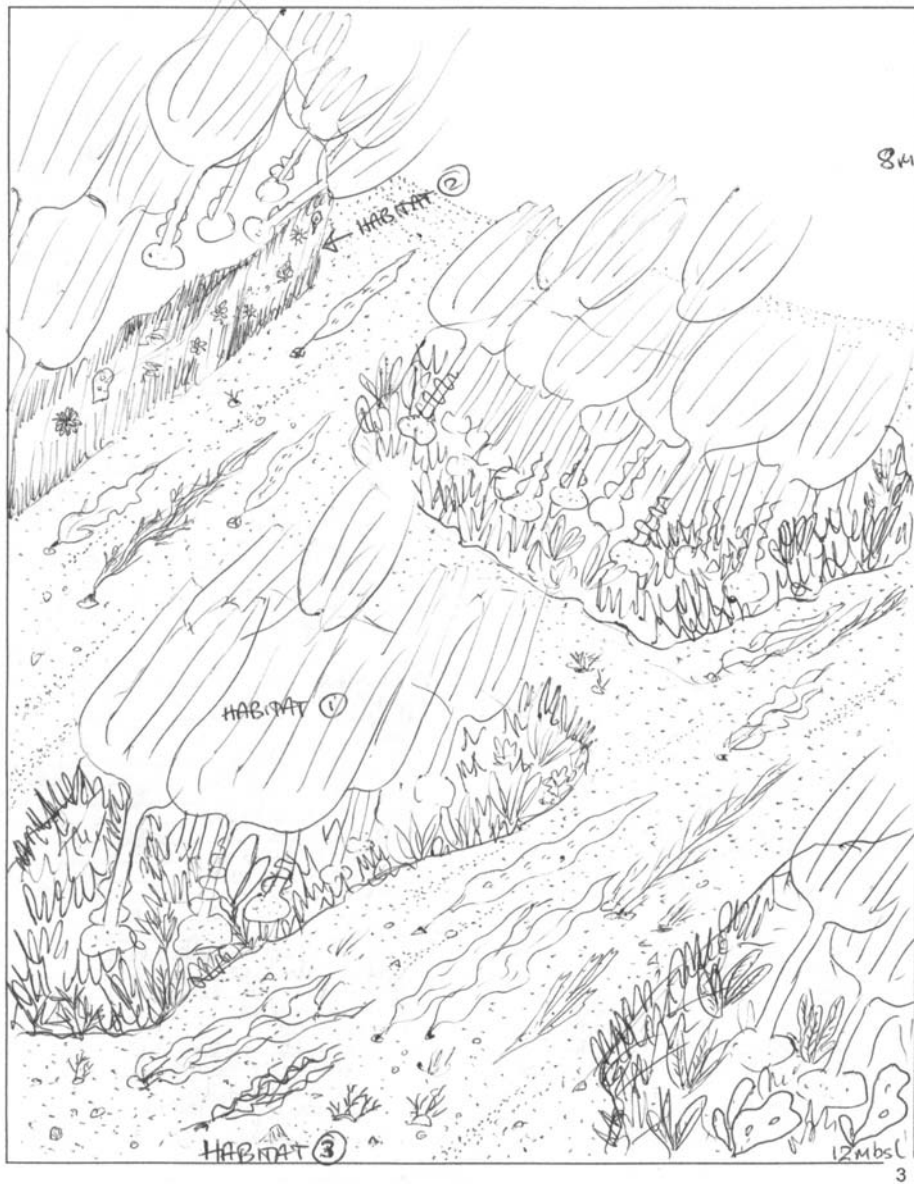
Daisy anemones *Cereus pedunculatus* in sand amongst luxuriant seaweeds including *Porphyra* sp and *Saccorhiza polyschides*. [Photo no.03.60.09. S Scott]



Daisy anemones *Cereus pedunculatus* were common in the sand, with scattered razor shells *Ensis* sp, sandmason worms *Lanice conchilega*, lugworms *Arenicola marina* and dragonets. Sand waves in deeper water at 19-21m had the solitary sea fir *Corymorpha nutans*, marbled swimming crabs, burrowing sea cucumber *Neopentadactyla mixta*, razor shells, necklace shells, queen scallops *Aequipecten opercularis*, hermit crabs and sandmason worms. There were also scattered fragments of maerl.

Sketches and plans

Draw a **profile 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 your **direction of travel** (compass bearing) and/or the **direction of any current**.



Sketch of Site 29, North Coll, North Channel, from Seasearch form.
[Sue Scott]

3.2.5. Sùil Ghorm

Sites 18-21 around the lighthouse were current-swept, with sediments affecting rock at the base of the island at around 23-26m. Coarse shell gravel and sand was mobile and relatively barren next to the rock, but more consolidated about 10m out from the rock base, and with a varied fauna. Typically this included marbled swimming crabs, dragonets (some very small), the sea fir *Sertularia cupressina*, sea mats *Securiflustra securifrons* and *Alcyonidium* sp, dahlia and burrowing anemones, fragments of maerl, and the red seaweed *Scinaia turgida* and green seaweed *Bryopsis plumosa* attached to shells.



Left: bryozoan *Securiflustra securifrons*; right anemone *Sagartia* sp in sand.
[Photo nos.03.55.06, 03.57.24. S Scott]



Next to the sediment, steep rock slopes had a limited fauna of cup corals *Caryophyllia smithii*, lightbulb seasquirts and other scour-resistant animals. In shallower water there was a wider variety of animal species, with kelp forests above 16m, to the top of the reef at 10m. Yarrell's blenny *Chirolophis ascani* and lumpsucker *Cyclopterus lumpus* were both seen at Site 21, and the colourful seaslug *Cuthona caerulea* at Site 20.

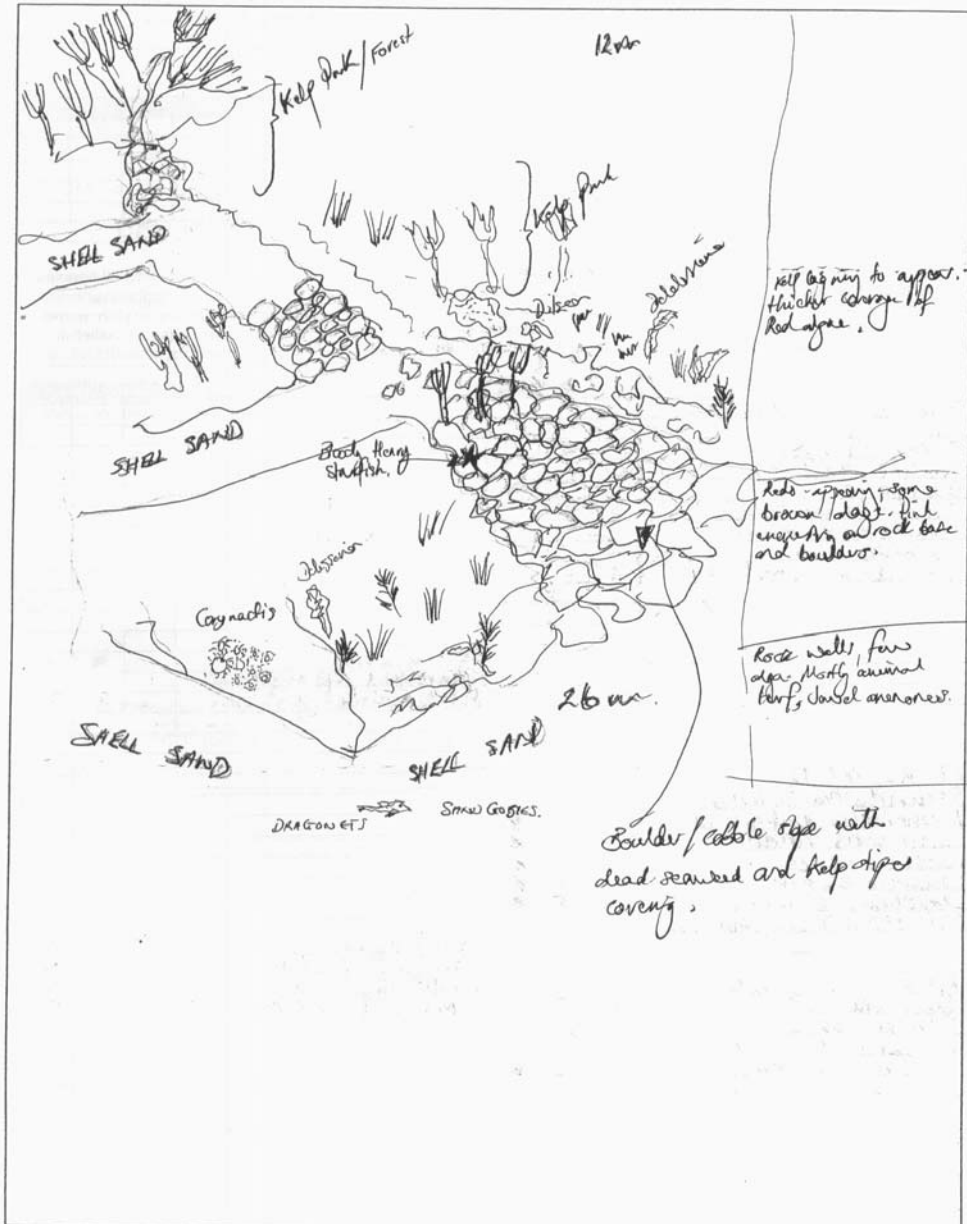
Tough life: cup corals, encrusting bryozoans, barnacles and red seaweeds on rock near to mobile sediments.
[Photo no. 03.56.24. S Scott]



Left: dahlia anemone, jewel anemones and barnacles. Right: seaslug *Cuthona caerulea* feeding on sea firs. [Photo nos. 03.57.06, 03.57.02. S Scott]

Sketches and plans

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3

Sketch of Site 19, Suil Ghorm, from Seasearch form.
[Sarah Hocknell/Chris Bronsden]

3.2.6. Cairns of Coll

Off the northern end of Coll, the Cairns (Sites 5-7) are swept by very strong currents on most states of the tide, with little slack water. These were very scenic sites, with a high proportion of colourful animals, thriving in the constant food supply and lack of grazing urchins. The seabed at these sites was mainly of bedrock slopes and walls, with some patches of shell gravel. Communities were typical of extreme water movement, dominated by anemones, barnacles, sea firs, bryozoans, and featherstars.



Colour clones of jewel anemones on vertical rock. [Photo nos. 03.53.22, 03.53.23, 03.53.21 S Scott]

In shallow water, dense kelp forest grew on less steep rocks, with an undergrowth of red and brown seaweed. On vertical rock in the kelp forest and at deeper depths, jewel anemones covered the rock surface in a patchwork of colour clones, often with elegant anemones and sponges. Ballan wrasse and conger inhabited deep crevices at the base of vertical faces at Site 6.



Left: conger in rock crevice. Right: dahlia anemone, banded brittlestars *Ophiactis balli*, jewel anemones and featherstars. [Photo nos. 03.53.26, 03.53.09. S Scott]



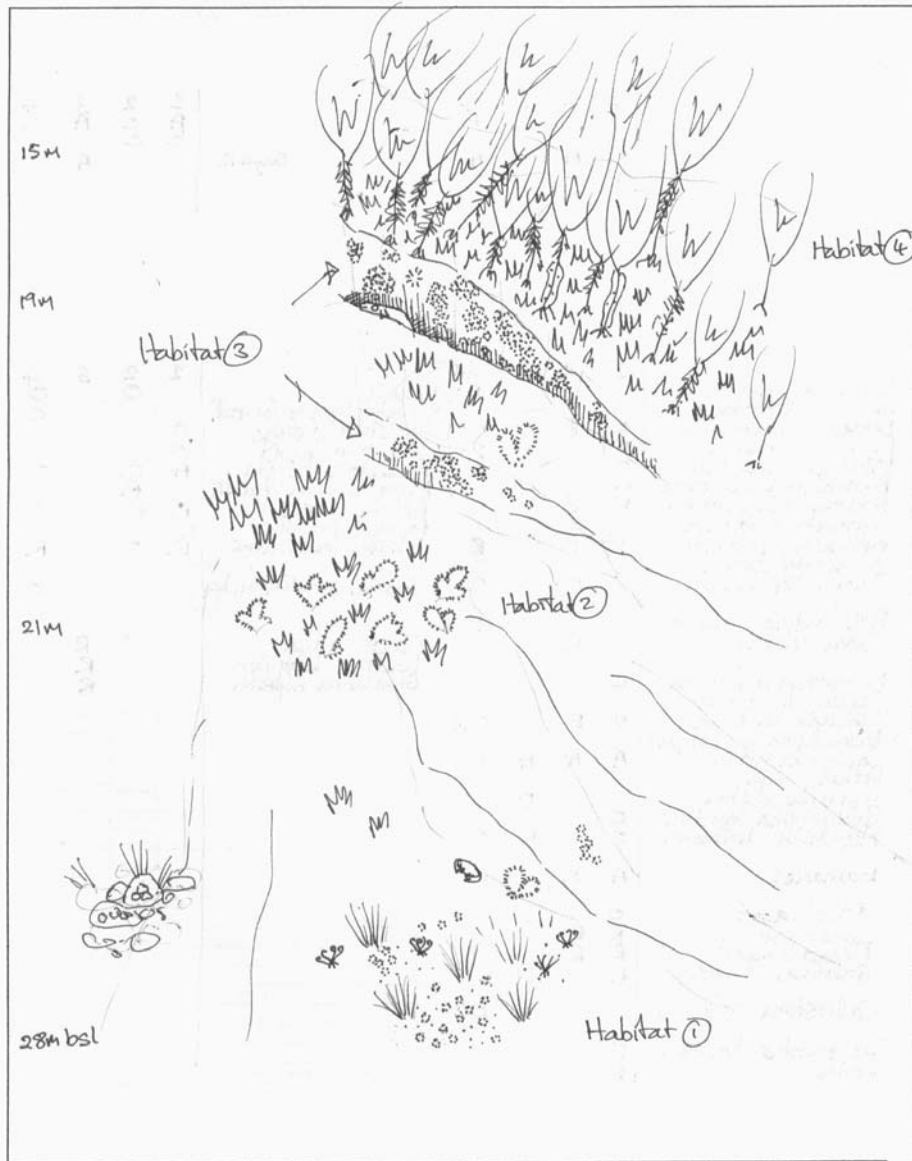
In deeper water, communities were patchy, varying from place to place. Below the kelp forest at 18-20m foliose algae and soft corals were often dense, while in deeper water sea firs and bryozoans were predominant, often with featherstars and jewel anemones. Many *Dendronotus frondosus* seaslugs were seen feeding on sea firs at all three sites, the grey seaslug *Aeolidia papillosa* was seen at Site 7, and there were dolid nudibranch eggs on sea firs. The northern starfish *Leptasterias muelleri* was recorded as common at Site 7.



Dense sea firs, including *Nemertesia ramosa*, *N. antennina* and *Tubularia indivisa*, erect bryozoans and featherstars. Inset: seaslug *Dendronotus frondosus* feeding on sea fir *Tubularia indivisa*. Right: decorator crab amongst animal turf. [Photo nos. 03.53.08, 03.53.13, 03.53.04. S Scott]

Sketches and plans

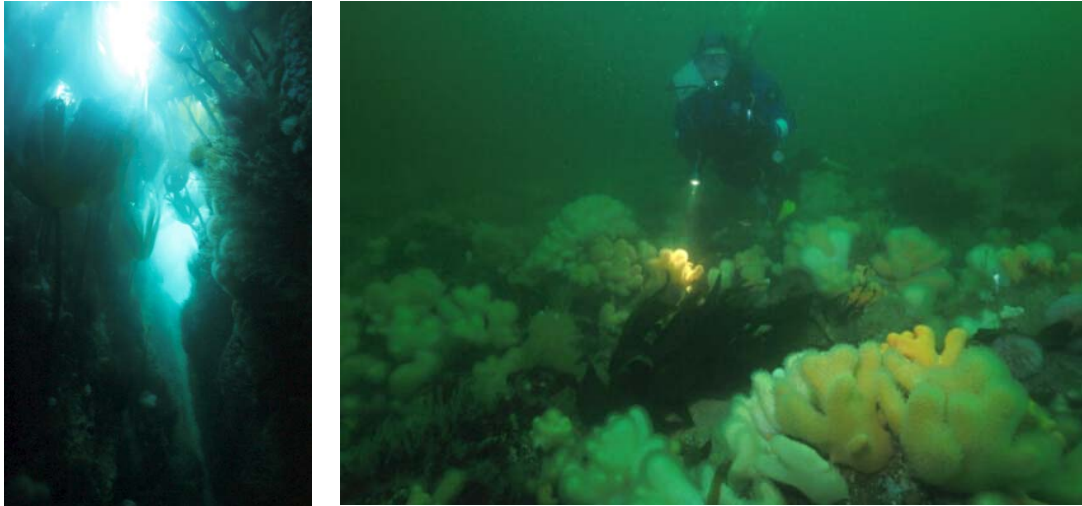
Draw a **profile or plan** of the sea bed you encountered on your dive in the space below. Mark (& number) the different habitats, corresponding to the written descriptions on p.2. Indicate conspicuous and/or characteristic species. Make sure you include **depth(s)** (vertical axis) and a **distance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



Sketch of Site 6, Cairns of Coll, from Seasearch form.
[Sue Scott]

3.2.7. North-east Coast

Sites 1-4, 8,9,31 and 32 were all on the current-swept north-east coast of Coll. The northernmost sites, at the small offshore rock of Eilean na h-Aornan (Sites 8 and 9), are very scenic and have become a favourite dive site of Lothian Divers. In shallow water (2-6m) the rock is split by a narrow cleft just big enough to swim through, with surge communities including elegant anemones and sponges on the walls. Light filtering through moving kelp curving over the top gave the cleft a cathedral-like quality. In deeper water the site has become known as the 'Yellow Brick Road' because of the abundance of soft corals, anemones, sponges and sea firs on current-swept boulders at 15-20m.



Site 8: left: wave-surged rock cleft in shallow water; right: diver on the 'Yellow Brick Road'.
[Photo Nos. 03.54.24, 03.54.16 S Scott]

Sites 1-4, 31 and 32 are clustered to the north of the entrance to Loch Eatharna, the only sheltered harbour on Coll. Near the shore, steep or broken slopes of bedrock were covered with dense kelp forest, and in places the dominant kelp was furbelows (*Saccorhiza polyschides*) rather than cuvie kelp. Below 12-15m, slopes were generally less steep, and of boulders and cobbles with shell gravel between, or ridges of bedrock with wide sandy gullies. Below 15m rocks and boulders were often covered with abundant soft corals, sea firs, sea mats and sponges. In some places the white anemone *Actinotheroe sphyrodeta* dominated larger boulders, and cotton spinner sea cucumbers were seen at several sites. Crustaceans were frequent amongst boulders, including a single lobster, at one of only 2 sites on Coll where these were seen.



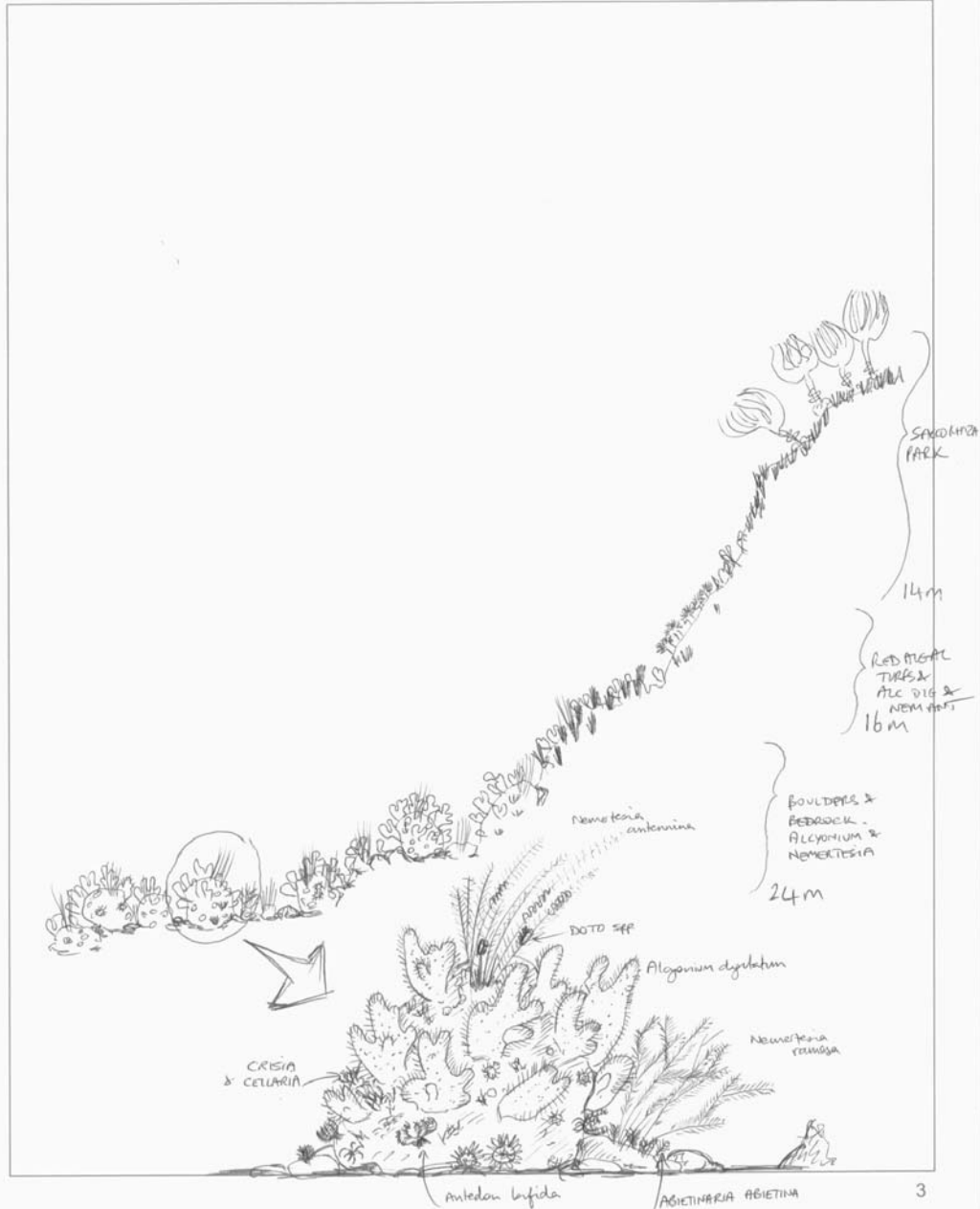
Left: boulder with anemones *Actinotheroe sphyrodeta*.
Right: Lobsters were rarely seen on the survey.
[Photo nos. 03.54.18, 03.54.15. S Scott]



At 28-38m at Sites 31 and 32, rock slopes became steeper with overhangs. On these deeper rocks, barnacles, sea firs, the erect bryozoan *Securiflustra securifrons*, and lightbulb seasquirts were most prominent, with occasional jewel anemones and cup corals. By contrast, at Sites 1 and 2, in the entrance to the harbour, rock slopes ended in a more gradual slope of sand and shell gravel from 20-25m downwards, with burrowing anemones, scallops and sandmason worms.

Sketches and plans

Draw a **profile 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 your direction of travel (compass bearing) and/or the direction of any current.



Sketch of Site 8, Yellow Brick Road, north-east coast, from Seasearch form.
 [Rohan Holt/Kirsten Ramsay]

3.2.8. Airne na Sgeire

Bedrock ridges ran eastwards from this offshore rock, with mixed sediments between, sloping down to 30m and beyond (Sites 10-13). These sites were more silty than those to the north east, especially in deeper water. Below the kelp forest, communities on bedrock were patchy, with featherstars dominant in some places, soft corals or hydroid/bryozoan turf in others. The rarely recorded ovulid mollusc *Simnia patula* was found feeding on soft corals, and the cotton spinner sea cucumber was recorded at 3 of the 4 sites.



Left: soft corals *Alcyonium digitatum*, with the yellow ovulid mollusc *Simnia patula* (centre right). Above: long-clawed squat lobster *Munida rugosa* beneath rock covered with hydroid/bryozoan turf. [Photo nos: 03.55.22, 03.55.20. S Scott]

The deeper parts of bedrock ridges appeared more current-swept, and often had a turf of sea firs and bryozoans, with the erect bryozoan *Securiflustra securifrons* dominant in places. There was a wide variety of sea firs, with *Nemertesia antennina* most prominent. Beneath the larger animal turf, barnacles were often abundant, with scattered cup corals.

The deeper sediments, with scattered cobbles and boulders, had a particularly interesting fauna with the daisy anemone *Cereus pedunculatus* common in sediments, and anemone *Hormathia coronata* and colonial anemone *Epizoanthus couchii* attached to stones and shells. There was a good variety of sea firs at these sites, and other fauna of interest included the sponge *Stelligera rigida*, seaslugs *Diaphodoris luteocincta*, *Tritonia hombergi* and *Acanthodoris pilosa*, and shoals of fish fry.



Anemone *Hormathia coronata* at Site 11. [Photo no. 03.55.05. S Scott]

Stones and rock outcrops in shell gravel at Site 11, with daisy anemone *Cereus pedunculatus*, anemone *Hormathia coronata* just above it, sea firs, barnacles and red seaweeds. [Photo no. 03.55.17. S Scott]

Sketches and plans

Draw a **profile 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 your direction of travel (compass bearing) and/or the direction of any current.



3

Sketch of Site 10, Airne na Sgeire, from Seasearch form.
[Rohan Holt/Kirsten Ramsay]

3.2.9. Calmac Jetty



Calmac jetty above and below water. The jetty pilings are covered with soft corals and plumose anemones.

[Photo nos. 03.46.14, 99.122.04. S Scott]



The cylindrical pilings of the Calmac jetty (Site 33) are vertical or angled, and have a rich epifauna, making the site an interesting dive by day or night. Plumose and elegant anemones and soft corals are abundant on the pilings, with jewel anemones on the outermost pilings. Young velvet swimming crabs *Necora puber*, brown crabs *Cancer pagurus* and bloody Henry starfish *Henricia* sp nestle amongst them, while on the sediments and cobbles beneath are dahlia anemones, long-spined sea scorpions *Taurulus bubalis*, dabs *Limanda limanda*, pea crabs and spiny squat lobsters *Galathea strigosa*. There is also a good seaweed flora here, on pebbles and cobbles at the edge of the jetty and on the pilings. Amongst these was found the 'tomcat' seaslug *Hermaea bifida* with its distinctive smell! The relatively rare starfish *Stichastrella rosea* was also found on the jetty.

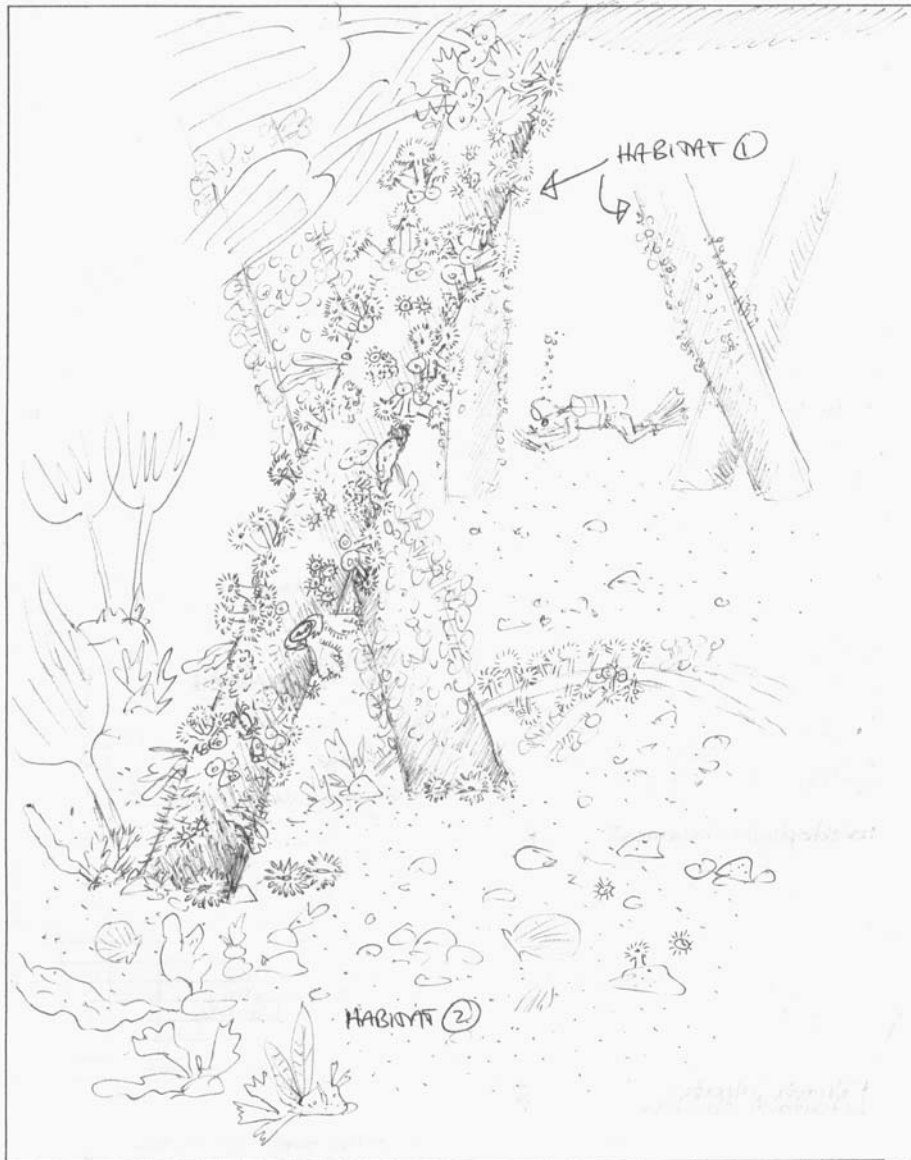


Colourful life beneath the jetty. Clockwise from top left: long-spined sea scorpion; bloody Henry starfish and elegant anemones; tomcat seaslug *Hermaea bifida* on kelp; another colour variety of elegant anemones.

[Photo nos: 03.61.09,.03.61.18, 03.61.06, 03.61.23. S Scott]

Sketches and plans

Draw a **profile 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 your **direction of travel** (compass bearing) and/or the **direction of any current**.



3

Sketch of Site 30, Calmac Jetty, from Seasearch form.
[Sue Scott]

3.3. Species

Phylum	Common name	No of species	Common species
Algae	Seaweeds	62	Encrusting coralline algae Kelp <i>Laminaria hyperborea</i> Sea beech <i>Delesseria sanguinea</i> <i>Heterosiphonia plumosa</i> <i>Dictyota dichotoma</i>
Porifera	Sponges	19	Boring sponge <i>Cliona celata</i> <i>Scypha ciliata</i>
Cnidaria	Anemones, corals, sea firs, jellyfish	34	Cup coral <i>Caryophyllia smithii</i> Sea beard <i>Nemertesia antennina</i> Soft coral, deadmen's fingers <i>Alcyonium digitatum</i> Jewel anemone <i>Corynactis viridis</i> Elegant anemone <i>Sagartia elegans</i> Dahlia anemone <i>Urticina felina</i>
Ctenophora	Comb jellies	3	
Nemertea	Worms	1	
Annelida	Segmented worms	8	Sandmason worm <i>Lanice conchilega</i>
Crustacea	Prawns, crabs, lobsters	27	Velvet crab <i>Necora puber</i> Brown crab <i>Cancer pagurus</i> Barnacles Cirripedia Hermit crabs <i>Pagurus bernhardus</i> Spider crab <i>Hyas coarctatus</i> Spiny squat lobster <i>Galathea strigosa</i>
Mollusca	Snails, bivalves, sea slugs	39	Painted topshell <i>Calliostoma ziziphinum</i> Sea hare <i>Aplysia punctata</i> Blue-rayed limpet <i>Helcion pellucidum</i> King scallop <i>Pecten maximus</i> Seaslug <i>Polycera quadrilineata</i>
Bryozoa	Sea mats	11	Encrusting species <i>Securiflustra securifrons</i> Lacy sea mat <i>Membranipora membranacea</i> <i>Alcyonidium</i> sp
Echinodermata	Starfish, urchins, sea cucumbers	20	Common urchin <i>Echinus esculentus</i> Common starfish <i>Asterias rubens</i> Spiny starfish <i>Marthasterias glacialis</i> Common featherstar <i>Antedon bifida</i> Bloody Henry starfish <i>Henricia</i> sp Cotton spinner <i>Holothuria forskali</i>
Tunicata	Sea squirts	16	Lightbulb seasquirt <i>Clavellina lepadiformis</i> Star sea squirt <i>Botryllus schlosseri</i> <i>Botrylloides leachii</i>
Pisces	Fish	28	Dragonet <i>Callionymus lyra</i> Goldsinny wrasse <i>Ctenolabrus rupestris</i> Cuckoo wrasse <i>Labrus mixtus</i>
TOTAL SPECIES		260	

Table 1. Number of species recorded on the Seasearch Coll survey in each main group of organisms, together with some common species. For a complete list of species, see Appendix III.



Left: King scallop *Pecten maximus*, easily identified by all divers. Right: only a biologist would enthuse over *Scinia turgida*, *Bryopsis plumosa*, *Laminaria* sp. *Ptilothamnion pluma*, *Callophyllis laciniata* and other seaweeds all growing on a small rock at the same site! [Photo nos. 03.57.18, 03.57.27 S Scott]



The number of species recorded by the survey reflects the type of survey which concentrated mainly on habitats, and prominent, easily identifiable species. However with several marine biologists on the survey, some of the more difficult animals and seaweeds were also recorded with confidence from some sites. The survey totals are also boosted by inclusion of a wide range of sites with varying habitats, substrata, exposure to waves and tidal streams.

The geographical position of Coll on the Scottish west coast is also relevant, because species with both northern and southern distributions occur here at or near their limits. Northern species include the red seaweeds *Odonthalia dentata* and *Ptilota gunneri*, starfishes *Stichastrella rosea* and *Leptasterias muelleri*, and Yarrell's blenny *Chirolophis ascani*. Southern species seen on this survey include the daisy anemone *Cereus pedunculatus*, the anemone *Hormathia coronata*, the cotton spinner sea cucumber *Holothuria forskali*, the potato crisp bryozoan *Pentapora foliacea*, the sting winkle *Ocenebra erinacea* and the pencil sponge *Ciocalypta penicillus*. The small ovulid gastropod *Simnia patula* is another species with southern distribution, rarely seen in Britain. On this survey it was relatively common, recorded at 5 sites, feeding on soft corals *Alcyonium digitatum*.



Animal species with a southern distribution in Britain found on Coll. Clockwise from top left: cotton spinner sea cucumber *Holothuria forskali*; ovulid *Simnia patula*; sting winkle *Ocenebra erinacea*; pencil sponge *Ciocalypta penicillus*. [Photo nos. 03.55.16, 03.58.15, 03.56.23, 03.56.20 S Scott]

Some species groups were particularly well represented. 62 species of algae is a particularly high total for a Scottish location, although 10 of them were recorded only from Site 29, an exceptionally rich site. 23 species of seaslugs (2 opisthobranchs and 21 nudibranchs) were seen, reflecting the wide range of food sources for them around Coll, particularly hydroids and bryozoans. Interesting nudibranchs included the rarely recorded *Okenia aspersa*, and the uncommon *Lomanotus genei*.



The rarely recorded seaslug *Okenia aspersa* at Site 15 on the north-west coast of Coll [Photo: R Holt]

28 species of fish were seen, many of them in boulder holes on the west coast. A red 'tompot' blenny recorded from Site 24 was probably the red or Portuguese blenny *Parablennius ruber*, only recently recognised from British waters, and recorded from a few sites on the west coast of Scotland and Ireland. The red blenny closely resembles the tompot blenny *Parablennius gattorugine*, with a similar tuft of tentacles over the head, but the red blenny is a brighter red colour, and the male fish has a distinctive blue spot on the dorsal fin when in breeding condition. However the two species are not easy to distinguish when seen in their usual habitat, in a crevice.

Conger were seen at only two sites, with ling at three, all at exposed sites on the west or north of Coll. Wrasse were reasonably common, with goldsinny and ballan seen on both east and west coasts, while cuckoo wrasse were recorded only from the west coast. By far the commonest fish was the dragonet, seen at 18 out of the 33 sites surveyed, often as tiny juveniles.



Fish nursery: juvenile fish seen on Coll. Clockwise from top left, dragonet (centre of photo!) in shell gravel, lump sucker, unidentified flatfish.
[Photo nos. 03.57.10, 03.55.14, 03.57.21 S Scott]

4. REFERENCES

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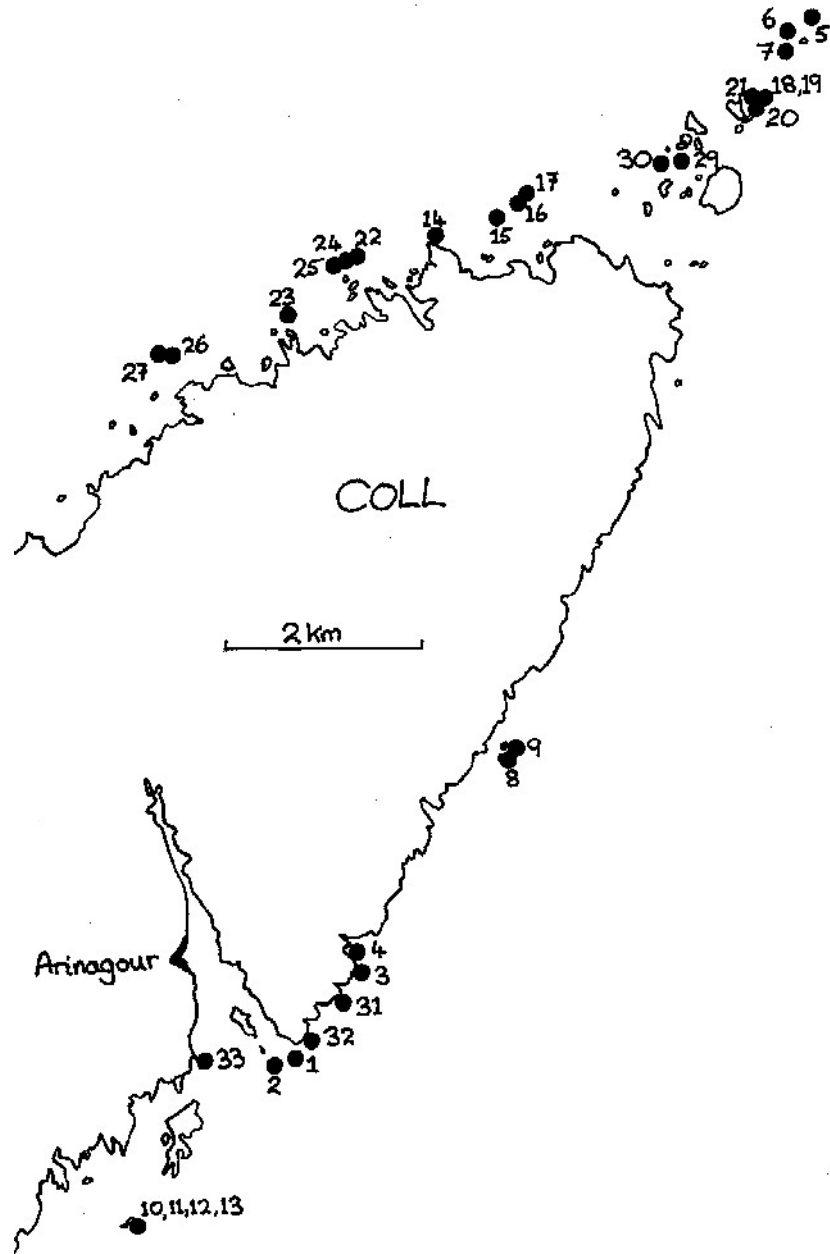
Dipper, F. (1981). *Sublittoral survey of Coll and Tiree, Inner Hebrides*. Nature Conservancy Council, CSD Report No 363.

Howson, C.M. and Picton, B.E. eds (1997). *The species directory of the marine fauna and flora of the British Isles*. Marine Conservation Society.

5. ACKNOWLEDGEMENTS

The hard work of the survey organisers Neil Cowie and Calum Duncan ensured the survey ran smoothly, and we are grateful for the use of Paul & Chris Turkentine's boat which was invaluable in reaching the more remote sites in safety. Thanks to Steve Dickison for filling cylinders, and for the great barbecue! Most of all thanks to the dive team for cheerfully filling in Seasearch forms, compiling much useful data.

Figure 1. Location of sites surveyed around Coll. Names and positions of sites are listed in Appendix I.



APPENDIX I. List of sites surveyed.

Most site positions were taken by GPS on the boats; the position for Site 33 was taken from Admiralty charts. BCD = below Chart Datum, depths marked with an asterisk are below sea level, not corrected to Chart Datum.

SITE NO	DATE	SITE NAME	SURVEYORS	START POSITION	DEPTHS BCD	
					UPPER	LOWER
1	07.06.03	Off Meall Eartharna	KR, RH	56 36.93 N 6 30.405 W	14.8	26.5
2	07.06.03	Off Meall Eartharna 2	CB, SH	56 36.871 N 6 30.519 W	12*	21.5*
3	07.06.03	Meall Mor	MH, NC	56 37.386 N 6 29.821 W	8.4	28.1
4	07.06.03	Meall Mor N	SM, SS	56 37.465 N 6 29.793 W	8*	19.5*
5	08.06.03	Cairns of Coll	KR, RH	56 42.79 N 6 25.977 W	14.3	22.6
6	08.06.03	Cairns of Coll 2	SM, SS	56 42.699 N 6 26.192 W	12.6	27.3
7	08.06.03	Cairns of Coll 3	MH, NC	56 42.609 N 6 26.233 W	7.1	27.3
8	08.06.03	Yellow Brick Road	KR, RH	56 38.63 N 6 28.48 W	10	21.8
9	08.06.03	Eileanan na h-Aornan	CB, MH, NC	56 38.633 N 6 28.479 W	8.3	28.1
10	09.06.03	Airne na Sgeire	KR, RH	56 35.95 N 6 31.75 W	16.2	31.4
11	09.06.03	Airne na Sgeire 2	SM, SS	56 35.906 N 6 31.869 W	9.1	28.4
12	09.06.03	Airne na Sgeire 3	MH, NC	56 35.938 N 6 31.786 W	4.1	38.4
13	09.06.03	Airne na Sgeire 4	CB, SH	56 35.899 N 6 31.827 W	15*	30*
14	10.06.03	SS Nevada Wreck	CT, MH, NC, PT RH, SM, SS	56 41.431 N 6 29.594 W	10.6	15.6
15	10.06.03	Sgeir Bhouds outer (SW)	KR, RH	56 41.573 N 6 28.994 W	13.1	20.1
16	10.06.03	Sgeir Bhouds outer (SW) 2	MH, NC	56 41.687 N 6 28.728 W	6.9	23.3
17	10.06.03	Outer Sgeir Bhouds (NE)	SM, SS	56 41.699 N 6 28.697 W	18.6	20.6
18	11.06.03	Sùil Ghorm (Cairns lighthouse)	KR, RH	56 42.320 N 6 26.480 W	12.6	24.7
19	11.06.03	Sùil Ghorm 2	SH, CD	56 42.296 N 6 26.485 W	12*	26.2*
20	11.06.03	Sùil Ghorm 3	SM, SS	56 42.295 N 6 26.486 W	8.6	23.6
21	11.06.03	North Bay Sùil Ghorm	CD, NC	56 42.324 N 6 26.515 W	4.9	27.4
22	11.06.03	NW of Eilean an Aird Heynish	KR, RH	56 41.272 N 6 30.395 W	16.5	29.6
23	11.06.03	WSW Eilean an Ime	MH, SD	56 40.957 N 6 30.962 W	1.4	16.5
24	11.06.03	N of Eilean an Aird Heynish	SM, SS	56 41.258 N 6 30.465 W	11.5	25.5
25	11.06.03	NW of Eilean an Aird Heynish 2	CD, NC	56 41.241 N 6 30.547 W	11.4	29.9
26	12.06.03	NW Coll	CD, SM, SS	56 40.696 N 6 32.095 W	15.6	35.4
27	12.06.03	NE of Bogh a Bhinnein	MH, NC	56 40.692 N 6 32.155 W	4.8	36.6
28	12.06.03	NW Coll 2	CB, SH	56 33.00 N 6 45.00 W	13*	37.2*
29	12.06.03	N Coll	CD, SM, SS	56 33.00 N 6 45.00 W	5	9.8
30	12.06.03	North Channel of Torr na Moine	MH, NC	56 41.929 N 6 27.335 W	3	18.5
31	13.06.03	South Eilean nam Muc	CD, SM	56 37.233 N 6 29.964 W	3.2	27.4
32	13.06.03	South of Port na Maoile, Meall Eathorna	MH, NC	56 37.007 N 6 30.229 W	6.7	37
33	14.06.03	Calmac jetty	MH, SS	NM 226562	0	6

APPENDIX II. Main features of sites surveyed.

For site positions see Appendix I and Figure 1. Depths marked with an asterisk are below sea level, not corrected to Chart Datum.

SITE NO	SITE NAME	MAIN SITE FEATURES
1	Off Meall Eathorna	Bedrock & boulder slope from 15-27m, then gentle slope of shell gravel, steepening below 30m.
2	Off Meall Eathorna 2	Bedrock from 12-18*m, boulder slope to 20*m, then gentle slope of shell gravel with few boulders to 22*m
3	Meall Mor	Mainly rocky slopes from 8m to 28m, with some sand on shelves. Steep rock & overhangs in deeper water
4	Meall Mor N	Rock & boulder ridges with vertical gully walls from 8-18m. Sand in wide bases of gullies.
5	Cairns of Coll	Tideswept bedrock ridges with vertical walls and boulders from 14-23m. Gullies with shell gravel.
6	Cairns of Coll 2	Tideswept bedrock slopes with some vertical rock from 12-27m
7	Cairns of Coll 3	Tideswept bedrock with short vertical sections from 7-27m. Valleys with cobbles & shell gravel
8	Yellow brick road	Steepish bedrock to 14m, then bedrock & boulder slopes with patches of shell gravel to 22m
9	Eileanan na h-Aornan	Steepish bedrock to 16m, then bedrock & boulder slopes with patches of shell gravel to 28m
10	Airne na Sgeire	Bedrock ridges from 16-30m, with sand & shell gravel between, steepening into deeper water
11	Airne na Sgeire 2	Bedrock & boulder ridges from 9-18m. Sand with cobbles & shells continuing to beyond 29m
12	Airne na Sgeire 3	Bedrock ridges, with sand between, some extending to beyond 38m. Some vertical-sided gullies at 4-12m, with sand in bases
13	Airne na Sgeire 4	Bedrock & boulders with gullies 6-23*m, sand with boulders & small rock outcrops 23-30*m
14	SS Nevada Wreck & surrounds	Various artificial substrata, rock, sand, cobbles
15	Sgeir Bhouds outer (SW)	Bedrock slopes to 20m, waves of coarse sand & shell gravel at 20m
16	Sgeir Bhouds outer (SW) 2	Bedrock with vertical-walled gullies 7-20m. Rippled coarse shell gravel 16-24m
17	Outer Sgeir Bhouds (NE)	Offshore rock pinnacle. Steep rock faces and gullies in shallow water, with boulder slope from 11-18m. Coarse shell gravel around the base, with scattered boulders & bedrock outcrops.
18	Sùil Ghorm (Cairns lighthouse)	Bedrock slopes from 12-24m, scoured by coarse sand & shell gravel at the base
19	Sùil Ghorm 2	Broad rock & boulder ridges with intersecting sand-bottomed gullies 12-26*m, rippled sand & shell gravel at base
20	Sùil Ghorm 3	Bedrock reef 18-22m, scoured at base by coarse sand & shell gravel in steepish slope
21	North Bay Sùil Ghorm	Sloping bedrock to 19m, then short cliff to mobile sand at 27m. Richer shell gravel further out
22	NW of Eilean an Aird Heynish	Bedrock ridges 16-30m, deep gullies with boulders in base
23	WSW Eilean an Ime	Rock slit by gully with vertical walls 2-16m, & cobbles in base. Shell gravel waves surrounding
24	N of Eilean an Aird Heynish	Steep bedrock ridges with some vertical faces, from 5.5-18m. Scoured near base where a boulder slope continued beyond 25m
25	NW of Eilean an Aird Heynish 2	Bedrock & boulder slopes, steep from 17-27m, then plain of rippled shell sand at 30m
26	NW Coll	Steep bedrock slopes to 35m, with boulders 22-29m, and coarse shell gravel at base at 35m
27	NE of Bogh a Bhinnein	Bedrock slopes from 5-19m, boulders from 19-37m, then shell gravel plain at 37m
28	NW Coll 2	Bedrock reef with gullies to 16.5*m, then mixed bedrock, boulders, cobbles & sand. Rippled clean sand & shell gravel at 35m
29	N Coll	Current-swept channel. Rock outcrops, cobbles & shells in coarse sand & shell gravel, 5-10m.
30	North Channel of Torr na Moine	Current-swept channel with sloping rock sides, & rock outcrops in coarse sand & shell gravel, 3-17m. Deeper sand in waves 17-19m
31	South Eilean nam Muc	
32	South of Port na Maoile, Meall Eathorna	Bedrock slopes with shelly gravel patches 7-17m, then steep & overhanging rock to beyond 37m
33	Calmac jetty	Cylindrical jetty pilings, sand & stones

APPENDIX III. Species recorded by the survey.

SPECIES NAME	SITE NUMBER
ALGAE	
RHODOPHYCOTA	
<i>Ahnfeltia plicata</i>	20
<i>Antithamnion</i> sp	33
<i>Apoglossum ruscifolium</i>	29
<i>Bonnemaisonia</i> sp	5
<i>Bonnemaisonia asparagoides</i>	1, 3,4,7,17,24,
<i>Brongniartella byssoides</i>	6,11,20
<i>Calliblepharis ciliata</i>	14
<i>Callophyllis laciniata</i>	4,6,11,14,18,20,24,29,33,
<i>Ceramium</i> sp	29
<i>Ceramium nodulosum</i>	32
<i>Cryptopleura ramosa</i>	7,12,20,22,24,29,33
<i>Cystoclonium purpureum</i>	29,33
<i>Delesseria sanguinea</i>	1,2,4,5,6,7,8,9,11,12,13,14,15,16,17,18,19,20,21,24,25,26,27,28,29,30,31,32,33
<i>Dilsea carnosa</i>	2,9,12,14,16,17,19,29,30,33
<i>Dumontia contorta</i>	29
<i>Erythroglossum laciniatum</i>	4
<i>Gracilaria verrucosa</i>	29
<i>Halarachnion ligulatum</i>	33
<i>Haraldiophyllum bonnemaisonii</i>	33
<i>Heterosiphonia plumosa</i>	1,4,5,6,7,8,,9,10,11,14,15,17,18,20,21,22,24,27,29,30,32,33
<i>Kallymenia reniformis</i>	1,2,4,11,33,
'Lithophyllum'	16,21
'Lithothamnion'	16,27
<i>Lomentaria clavellosa</i>	1,20,33
Maerl indet	10,21,30
<i>Membranoptera alata</i>	17,24
<i>Nitophyllum punctatum</i>	1,4,6,8,11,17,18,21,22,24,29,31
<i>Odonthalia dentata</i>	1,4,18,20,24,29,30,33
<i>Palmaria palmata</i>	2,13,17,31,33
<i>Phycodrys rubens</i>	1,2,3,6,11,13,14,20,24,28,33
<i>Phyllophora crispa</i>	4,17,20,29
<i>Plocamium cartilagineum</i>	1,4,5,7,9,10,11,12,13,15,17,18,20,21,29,33
<i>Polysiphonia</i> sp	3,29
<i>Polysiphonia atlantica</i>	17,20
<i>Polysiphonia fucoides</i>	29,33
<i>Polysiphonia nigra</i>	4,17
<i>Porphyra</i> sp	17,29,33
<i>Porphyropsis coccinea</i>	17,29
<i>Pterosiphonia parasitica</i>	4,11,20,24
<i>Ptilota gunneri</i>	17,33
<i>Ptilothamnion pluma</i>	17,20
<i>Rhodophyllis divaricata</i>	29,33
<i>Rhodymenia pseudopalmata</i>	9,13
<i>Scinia</i> sp	1,20,33

Rhodophycota indet	2,6,8,24,28,31,
CHROMOPHYCOTA	
<i>Alaria esculenta</i>	17
<i>Asperococcus fistulosus</i>	29
<i>Chorda filum</i>	29
<i>Cutleria multifida</i>	24
<i>Cutleria multifida</i> (Aglaozonia)	20
<i>Desmarestia</i> sp	21,30
<i>Desmarestia aculeata</i>	20,24,29
<i>Desmarestia ligulata</i>	29,33
<i>Desmarestia viridis</i>	29
<i>Dictyota dichotoma</i>	1,3,4,5,6,7,8,9,10,11,12,14,17,20,21,22,24,25,26,27,29,31,32,33,
<i>Halidrys siliquosa</i>	3,14,17,20,29
<i>Laminaria hyperborea</i>	1,4,5,6,7,8,9,11,12,13,14,15,16,17,18,19,20,21,22,24,25,26,27,28,29,31,32,33,
<i>Laminaria saccharina</i>	4,7,9,12,14,29,30,32,
Laminariaceae indet	2
<i>Petalonia</i> sp	29
<i>Punctaria</i> sp	29,33
<i>Saccorhiza polyschides</i>	1,3,4,8,9,11,14,16,20,22,24,29,30,32,33
<i>Sphacelaria</i> sp	29
Phaeophyceae indet	6,24
CHLOROPHYCOTA	
<i>Bryopsis plumosa</i>	20,33
<i>Cladophora</i> sp	33
<i>Derbesia marina</i> (Halicystis)	6
<i>Ulva lactuca</i>	2,29
<i>Enteromorpha</i> sp	29
<i>Enteromorpha linza</i>	29,33
Diatoms - film	29
PORIFERA	
<i>Axinella dissimilis</i>	28
<i>Ciocalypta penicillus</i>	17
<i>Cliona celata</i>	1, 2,3, 4,5,6,7,8,9,10,11,12,13,15,16,17,21,22,24,25,26,27,28,31,32
<i>Esperiopsis fucorum</i>	29,33
<i>Halichondria</i> sp	31,32
<i>Halichondria bowerbanki</i>	11
<i>Halichondria panicea</i>	6,11
<i>Haliclona</i> sp	9,12,16
<i>Haliclona viscosa</i>	1,7,15,28,33
<i>Hemimycale columella</i>	22
<i>Leucosolenia</i> sp	1
<i>Leucosolenia botryoides</i>	24,29,33
<i>Leucosolenia complicata</i>	15
<i>Myxilla incrustans</i>	15,16
<i>Pachymatisma johnstonia</i>	22,24,25,26,28
<i>Plocamilla coriacea</i>	24
<i>Polymastia</i> sp	16,25
<i>Polymastia boletiformis</i>	3,7
<i>Polymastia mamillaris</i>	9,15,27

<i>Raspailia</i> sp	11
<i>Raspailia ramosa</i>	12,25,32
<i>Scypha</i> sp	9,16,21,32
<i>Scypha ciliata</i>	1,3,5,7,8,10,11,12,13,27
<i>Stelligera rigida</i>	10
<i>Suberites</i> sp	25
CNIDARIA	
HYDROZOA	
<i>Abietinaria</i> sp	4
<i>Abietinaria abietina</i>	10,15,18,22,24,25,26,31
<i>Aglaophenia</i> sp	10,27,30
<i>Aglaophenia tubulifera</i>	1
<i>Corymorpha nutans</i>	30
<i>Halecium halecinum</i>	1,3,5,7,8,9,15,21,25,27,31,32,
<i>Hydrallmania falcata</i>	8,10
<i>Kirchenpaueria</i> sp	8,18
<i>Kirchenpaueria pinnata</i>	1,10,15
<i>Nemertesia antennina</i>	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,18,19,20,21,22,24,26,27,28,31,32,
<i>Nemertesia ramosa</i>	1,2,5,6,7,8,9,11,12,13,15,18,20,21,22,26,27,31
<i>Obelia</i> sp	21,25,26
<i>Obelia dichotoma</i>	4,17,20,29
<i>Obelia geniculata</i>	7,11,27,31
<i>Sertularia</i> sp	11,12,16,21
<i>Sertularia argentea</i>	29
<i>Sertularia cupressina</i>	18
<i>Tubularia</i> sp	3
<i>Tubularia indivisa</i>	2,5,6,7,8,9,14,18,20,24,32
Hydrozoa indet	4,14,17,20,33
SCYPHOZOA	
<i>Aurelia aurita</i>	17,33
<i>Cyanea capillata</i>	33
<i>Cyanea lamarckii</i>	11
ANTHOZOA	
<i>Actinothoe sphyrodeta</i>	4,7,9,16,21,29
<i>Alcyonium</i> sp	16
<i>Alcyonium digitatum</i>	3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,20,21,22,24,25,26,27,28,31,32,
<i>Anemonia viridis</i>	20,29
<i>Caryophyllia</i> sp	12,14
<i>Caryophyllia smithii</i>	1,3,4,6,7,8,9,10,11,12,13,14,15,16,17,19,20,21,22,24,25,26,27,28,29,31,32
<i>Cereus pedunculatus</i>	1,8,11,29
<i>Cerianthus lloydii</i>	12,3,4,10,11,20,25,30,31,33
<i>Corynactis viridis</i>	3,4,5,6,7,8,9,10,11,12,13,15,16,18,19,20,21,22,24,25, 26,27,28,29,32,33
<i>Epizoanthus couchii</i>	8,10,11,12,
<i>Hormathia coronata</i>	1,5,8,10,11
<i>Metridium senile</i>	3,4,5,7,9,11,12,13,14,16,25,32
<i>Sagartia elegans</i>	1,2,3,4,5,6,7,9,10,11,12,13,14,16,19,21,24,25,27,29,30,32,33
<i>Urticina</i> sp	14,15,16,21
<i>Urticina eques</i>	19
<i>Urticina felina</i>	1,2,4,5,6,7,8,9,11,17,18,20,24,25,26,27,29,30,32,33,
Actiniaria indet	12

CTENOPHORA	
<i>Beroe cucumis</i>	33
<i>Bolinopsis infundibulum</i>	33
<i>Pleurobrachia pileus</i>	33
NEMERTEA	
<i>Tubulanus annulatus</i>	12
ANNELIDA	
<i>Arenicola marina</i>	29
<i>Bispira volutacornis</i>	24
<i>Chaetopterus</i> sp	1
<i>Chaetopterus variopedatus</i>	10
<i>Lanice conchilega</i>	1,2,3,10,12,13,16,25,27,29,30
<i>Pomatoceros</i> sp	5
<i>Pomatoceros lamarcki</i>	13
<i>Pomatoceros triqueter</i>	24,25,29
<i>Sabella pavonina</i>	12,13
Terebellidae indet	16
CRUSTACEA	
Amphipoda indet	29,33
<i>Anapagurus hyndmanni</i>	15
Balanomorpha indet	1,2,3,4,6,7,8,10,11,15,17,18,20,21,22,24,26,29,31,32,33
<i>Balanus</i> sp	7,9,12,14,16,25,27,30
<i>Balanus balanus</i>	13
<i>Balanus crenatus</i>	28
<i>Cancer pagurus</i>	1,2,3,4,5,6,7,8,9,11,12,13,14,16,17,18,19,21,22,24,25,27,28,29,30,31,32,33
<i>Caprella linearis</i>	2
Caprellidae indet	5,14,18,33
<i>Carcinus maenas</i>	29
Caridea indet	33
<i>Galathea</i> sp	6
<i>Galathea intermedia</i>	30
<i>Galathea nexa</i>	4
<i>Galathea strigosa</i>	4,6,7,9,14,17,21,24,27,33
<i>Hippolyte</i> sp	17
<i>Homarus gammarus</i>	4,28
<i>Hyas araneus</i>	7,19,21
<i>Hyas coarctatus</i>	5,12,15,16,18,22,27,30,32
<i>Inachus</i> sp	4,6
<i>Inachus phalangium</i>	22
<i>Liocarcinus depurator</i>	16,21,29
<i>Liocarcinus marmoreus</i>	20,30
<i>Macropodia</i> sp	18
<i>Macropodia rostrata</i>	4
Majidae indet	11
<i>Munida rugosa</i>	1,9,11,12,26,27,28,32
Mysidacea indet	17,21
<i>Necora puber</i>	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,24,27,28,29,30,31,32,33
<i>Pagurus</i> sp	20,27,30

<i>Pagurus bernhardus</i>	1,2,8,14,15,16,18,19,21,29,33
<i>Palaemon elegans</i>	7
Palaemonidae indet	17,20
Pinnotheridae indet	33
Porcellanidae indet	7
CHELICERATA	
Pycnogonidae indet	7,20
MOLLUSCA	
GASTROPODA	
<i>Buccinum undatum</i>	21
<i>Calliostoma zizyphinum</i>	2,3,4,6,7,8,9,12,16,19,22,24,26,27,28
<i>Euspira catena</i>	14
<i>Gibbula</i> sp	8,21,22,25,26,
<i>Gibbula cineraria</i>	14,17,30
<i>Gibbula magus</i>	29
<i>Helcion pellucidum</i>	11,12,15,17,19,21,24,27
<i>Ocenebra erinacea</i>	17
<i>Simnia patula</i>	11,12,22,24,27
<i>Trivia</i> sp	26
Gastropodidae indet	26
OPISTHOBRANCHIA	
<i>Aplysia punctata</i>	1,3,4,6,7,11,16,17,21,27,29
<i>Hermaea bifida</i>	33
NUDIBRANCHIA	
<i>Acanthodoris pilosa</i>	3,4,9,12,16,27
<i>Aeolidia papillosa</i>	7
<i>Coryphella</i> sp	18
<i>Coryphella browni</i>	3,19
<i>Coryphella lineata</i>	12,17
<i>Crimora papillata</i>	16,27
<i>Cuthona caerulea</i>	20
<i>Dendronotus frondosus</i>	5,6,7,15,18
<i>Diaphorodoris luteocincta</i>	10
Doridacea indet	6
<i>Doto</i> sp	1,3,5,8,10,15,18,21
<i>Doto coronata</i>	9,12,27
<i>Doto fragilis</i>	7
<i>Eubranchus</i> sp	21,25
<i>Eubranchus pallidus</i>	16
<i>Eubranchus tricolor</i>	28
<i>Facelina</i> sp	8,10
<i>Flabellina</i> sp	29
<i>Janolus cristatus</i>	12,15,25,33
<i>Limacia clavigera</i>	8,33
<i>Lomanotus genei</i>	12
<i>Okenia aspersa</i>	15
<i>Onchidoris</i> sp	10
<i>Polycera faeroensis</i>	4,7,8,10,15,16,18,
<i>Polycera quadrilineata</i>	1,12,14,17,20,21,24,28,29
<i>Tritonia hombergi</i>	12

Nudibranchia indet	14,25
PELECYPODA	
<i>Aequipecten opercularis</i>	2,28,30,32
<i>Chlamys varia</i>	33
<i>Circomphalus casina</i>	13
<i>Ensis</i> sp	10, 29, 30
<i>Pecten maximus</i>	1,3,4,7,11,12,13,20,21,26
BRYOZOA	
<i>Alcyonidium</i> sp	16,20,21,24,25,26
<i>Alcyonidium diaphanum</i>	9,10,12,15,22,27,
<i>Bugula</i> sp	17,21,27,33
<i>Bugula flabellata</i>	1,5,15,22
<i>Cellaria fistulosa</i>	5,7,8,10,27
<i>Cellepora pumicosa</i>	1
<i>Crisia</i> sp	1,5,8,10,14,15
<i>Electra pilosa</i>	6,18,20,26,29
<i>Membranipora membranacea</i>	2,3,11,21,25,26,27,28
<i>Pentapora foliacea</i>	3,31
<i>Porella compressa</i>	22,24,26,27
<i>Scrupocellaria</i> sp	5,15,16
<i>Securiflustra securifrons</i>	1,3,10,11,12,21,22,24,25,26,27,28,31
Bryozoa indet	6,12
Bryozoa indet crusts	1,4,5,6,9,10,15,16,17,22,24,25,27,31,33
ECHINODERMATA	
<i>Antedon bifida</i>	2,5,6,8,9,11,13,15,16,20,21,24,25,26,27,28
<i>Aslia lefevrei</i>	13,17,28
<i>Asterias rubens</i>	1,2,3,4,5,6,7,8,10,11,12,13,14,15,16,17,18,21,22,24,25,26,27,28,29,30,31,33
<i>Astropecten irregularis</i>	26
<i>Crossaster papposus</i>	1,3,7,8,9,11,12,16,21,31
<i>Echinus esculentus</i>	1,2,3,4,5,6,7,8,9,10,11,12,13,15,16,17,18,20,21,22,24,25,27,28,29,30,31,33
<i>Henricia</i> sp	33
<i>Henricia oculata</i>	3,5,7,9,12,16,18,19,21,27,28,29
<i>Henricia sanguinolenta</i>	24
<i>Holothuria forskali</i>	1,3,4,9,11,12,13,24,25,26,27,28
Holothuroidea indet	12
<i>Leptasterias muelleri</i>	7,27
<i>Luidia ciliaris</i>	3,4,8,12,14,15,16,17,18,21,22,24,25,27,28,30
<i>Marthasterias glacialis</i>	1,3,4,6,7,9,11,12,13,14,15,16,19,21,22,24,25,27,28
<i>Neopentadactyla mixta</i>	25,30
<i>Ophiactis balli</i>	6
<i>Ophiothrix fragilis</i>	2,5,33
<i>Ophiura</i> sp	27,30
<i>Ophiura albida</i>	10,15
<i>Pawsonia saxicola</i>	22,24,26,27
<i>Porania pulvillus</i>	1,3,5,6,9,12
<i>Stichastrella rosea</i>	33
TUNICATA	
<i>Aplidium</i> sp	3,16,21
<i>Aplidium proliferum</i>	14
<i>Aplidium punctum</i>	1

<i>Ascidia mentula</i>	1,4,17
Ascidacea indet	6
<i>Ascidella aspersa</i>	16,28
<i>Botrylloides leachii</i>	15,17,18,20,21,24,33
<i>Botryllus schlosseri</i>	1,3,7,11,17,18,20,24,27,28,29,30
<i>Ciona intestinalis</i>	1,12,27
<i>Clavelina lepadiformis</i>	1,2,3,4,8,10,11,12,13,14,16,17,21,22,24,25,26,28,29,30,31
<i>Dendrodoa grossularia</i>	9
<i>Diazona violacea</i>	13
<i>Didemnum maculosum</i>	1
Didemnidae indet	1,7,11,33
<i>Diplosoma</i> sp	10,18
<i>Lissoclinum perforatum</i>	18
<i>Polycarpa scuba</i>	12
<i>Polyclinum aurantium</i>	1,22
<i>Sidnyum</i> sp	15
PISCES	
<i>Ammodytes tobianus</i>	16
<i>Callionymus lyra</i>	1,3,8,10,11,12,13,14,17,19,20,21,28,29,30,31,33
<i>Callionymus</i> sp (juvenile)	17,20,24
<i>Chirolophis ascani</i>	21
<i>Conger conger</i>	6,27
<i>Ctenolabrus rupestris</i>	4,6,13,14,17,24,25,26,27
<i>Cyclopterus lumpus</i>	11,21
<i>Entelurus aequoreus</i>	17
Gadidae indet	22,24
<i>Gaidropsaurus vulgaris</i>	16,24
<i>Gobiusculus flavescens</i>	4
<i>Labrus bergylta</i>	6,10,14,25
<i>Labrus mixtus</i>	14,22,25,27,28
<i>Limanda limanda</i>	27,33
<i>Molva molva</i>	14,19,25
<i>Myoxocephalus scorpius</i>	27
<i>Parablennius ?ruber</i>	24
<i>Pholis gunnellus</i>	2,3,4,9,11
<i>Platichthys flesus</i>	16
<i>Pleuronectes platessa</i>	30
<i>Pollachius pollachius</i>	3,13,14,16
<i>Pollachius virens</i>	25,26,27,28
<i>Pomatoschistus</i> sp	4
<i>Pomatoschistus minutus</i>	3,14,19
<i>Scyliorhinus canicula</i>	16,17
<i>Solea solea</i>	27
<i>Taurulus bubalis</i>	3,33
<i>Thorogobius ephippiatus</i>	14,27
<i>Trisopterus luscus</i>	14,25
<i>Trisopterus minutus</i>	14,25
<i>Zeugopterus punctatus</i>	7,10,15,16
Pisces indet	9,11,13,14,16,20,27,29,30

APPENDIX IV. Example of completed Seasearch survey form.

SITE 22

SEASEARCH SURVEY FORM



www.seasearch.org.uk

- 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	Verified by	Date
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Your details

Name	KIRSTEN RAMSAY + ROHAN HOLT	Tel No:	01248 385685	h/m/wk
Address	TAN HWFA, LLANLLECHID, BANGOR	Email:	kirsten@meraisubaque.org	
		Buddy's Name		
		Name of group or survey		
Postcode	LL57 3LA		Call Seasearch 2003	

Dive details

Site name				NW of ELEAN AN AIRD HEANISH, N. COLL		Date of dive:	11 dd / 06 mm / 03 yy
General location				South west of Bhownd, Coll, Hebrides		Start of dive:	16:00 (24hr)
						Dive duration:	40 (mins)
						U/W visibility:	8 m
						Sea temperature:	12 °C
Position	Latitude	Longitude	W or E	Drift dive?			
Centre of site	56° 41.272	06° 30.395	W	Night dive?			
For drift dives				Did you take any of the following?			
From	0	0		photographs	yes / no		
To	0	0		video footage	yes / no		
Or OS Grid Reference				specimens	yes / no		
Position derived from: (circle)				seaweeds for pressing	yes / no		
GPS Admiralty chart OS map other				GPS Datum (circle)			
GPS				WSG84 OSGB36			

Seabed summary

Tick which types of seabed were present rocky reef <input checked="" type="checkbox"/> boulders <input checked="" type="checkbox"/> cobbles/pebbles <input type="checkbox"/> mixed ground <input type="checkbox"/> sand/gravel <input type="checkbox"/> mud <input type="checkbox"/> wreckage <input type="checkbox"/> other <input type="checkbox"/> Circle the dominant one	For the area surveyed, what was the deepest depth? (m) 33 bsl bcd the shallowest depth? (m) 14 bsl bcd Tidal correction to chart datum m*
Summarise: a. the main features of the seabed, b. any unusual features or species, c. any human activities or impacts at the site. Rocky ridges with boulder gullies, bottom of which was covered in boulders. Lots of relatively large <u>Porella compressa</u>	

Habitat descriptions

Complete a box below for each **habitat** you found on your dive. Each written description should tally with the information entered in the columns below and with your diagrams on the next page. If you found more than 3 habitats, continue your descriptions on another Form. Tick boxes where shown, or give percentages (make sure they add up to 100%), or assign a score from 1-5 as appropriate. If you are uncertain about anything, leave the box blank.

1. DESCRIPTION

Bedrock ridges with kelp part and ~~red~~ algal turf at 20m BSL
Not surveyed in detail

2. DESCRIPTION

Bedrock ridges with algal turf at 20-23m BSL
Dominated by *Dictyota dichotoma*

3. DESCRIPTION

Bedrock ridges and gully with boulders in bottom of gully 23-33m BSL.
Dominated by *Alcyonium digitatum*. Some very large *Porella compressa*

1	2	3	
	20	23	DEPTH LIMITS
			Upper (from sea level) (i.e. minimum)
20	23	33	Lower (from sea level) (i.e. maximum)
			Upper (from chart datum) *
			Lower (from chart datum) *

1	2	3	
	100	80	SUBSTRATUM
			Bedrock type?:
		5	Boulders - very large > 1.0 m
		5	- large 0.5 - 1.0 m
		10	- 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	
	4	4	1-5
			FEATURES - ROCK (all categories)
4	4	4	Relief of habitat (even - rugged)
3	3	3	Texture (smooth - pitted)
1	1	1	Stability (stable - mobile)
3	3	3	Scour (none - scoured)
1	1	1	Silt (none - silted)
3	3	3	Fissures > 10 mm (none - many)
3	3	3	Crevices < 10 mm (none - many)
3	3	3	Boulder/cobble/pebble shape (rounded - angular)
			Sediment on rock? (tick if present)

1	2	3	
			FEATURES - SEDIMENT (1)
			Mounds / casts
			Burrows / holes
			Waves (>10 cm high)
			Ripples (< 10 cm high)
			Subsurface coarse layer?
			Subsurface anoxic (black) layer?

1	2	3	
			1-5
			FEATURES - SEDIMENT (2)
			Firmness (firm - soft)
			Stability (stable - mobile)
			Sorting (well - poor)

Sketches and plans

Draw a **profile 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 your direction of travel (compass bearing) and/or the direction of any current.



