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Broadscale survey of the habitats of Rockall Bank and mapping of Annex I 'reef' habitat

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Contents

1. Introduction

1.1 Background

In 1992 the European Community adopted Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (EC Habitats Directive). The provisions of the EC Habitats Directive require Member States to introduce a range of measures including the protection of habitats and species listed in the Annexes; to undertake surveillance of habitats and species, and produce a report every six years on the implementation of the Directive. Each Member State is required to prepare and propose a national list of sites for evaluation in order to form a European network of Sites of Community Importance (SCIs). Once adopted, these are designated by Member States as Special Areas of Conservation (SACs), and along with Special Protection Areas (SPAs) classified under the EC Birds Directive, form a network of protected areas known as Natura 2000. Selection of SACs and SPAs in the UK was, in the first instance confined to terrestrial sites and within UK territorial seas (6nm). However, as a result of a UK court judgement in 1999, the UK Government is now taking steps to implement the Habitats Directive in offshore waters (and has also agreed to take parallel steps to apply the requirements of the Birds Directive to all relevant marine waters).

Within the UK the Joint Nature Conservation Committee (JNCC), the UK Government's wildlife adviser on national and international conservation issues, has been given the task of identifying areas in the UK offshore environment (beyond 12nm) for possible notification as Special Areas for Conservation (SACs) under the EC Habitats Directive. The initial stages involved in this process have been reported on elsewhere (Johnston *et al*, 2002) but will be summarised here.

Of the 189 habitats listed in Annex I of the Directive, four were identified as being known to or as potentially occurring in UK offshore waters, these were:

- sandbanks which are slightly covered by sea water all the time;
- reefs;
- submarine structure made by leaking gases; and
- submerged or partially submerged sea caves.

The location and extent of areas of possible Annex I habitat in offshore waters were mapped using existing British Geological Society (BGS) geological seabed map interpretations. Biological and other data available for potential Annex I habitat in UK offshore waters were collated and reviewed. Following this process it became apparent that limited biological data were available for a number of areas of potential Annex I habitat, and for some areas there were no biological data available.

This was particularly true for reef habitat. Johnston *et al* (2002), provide the official definitions of reef under the terms of the Directive. Within UK offshore waters a number of different types of reef with a range of biological communities were identified and are summarised below:

- bedrock reef - pinnacles, offshore banks;
- stony reefs - cobble and boulder reefs, iceberg plough marks;

- biogenic reefs – cold water corals (eg. *Lophelia pertusa*) and *Sabellaria spinulosa* (*Modiolus modiolus* reef occurs primarily within 12 nm of the coast).

The distribution of bedrock and stony reef types within UK offshore waters have been mapped using BGS data (Figure 1.1). These data are at a resolution of 1:250,000 and are therefore not of sufficient resolution to inform a site selection process although they do provide a base from which to investigate further. There are no data on the distribution of biogenic reef in offshore waters. It is clear from figure 1.1 that the bulk of the mapped UK reef resource is located in the deep-water areas west and north of Scotland, and is associated with the continental slope, offshore banks and seamounts. This project focuses on Rockall Bank, the largest offshore bank within the UK Continental Shelf Limit.

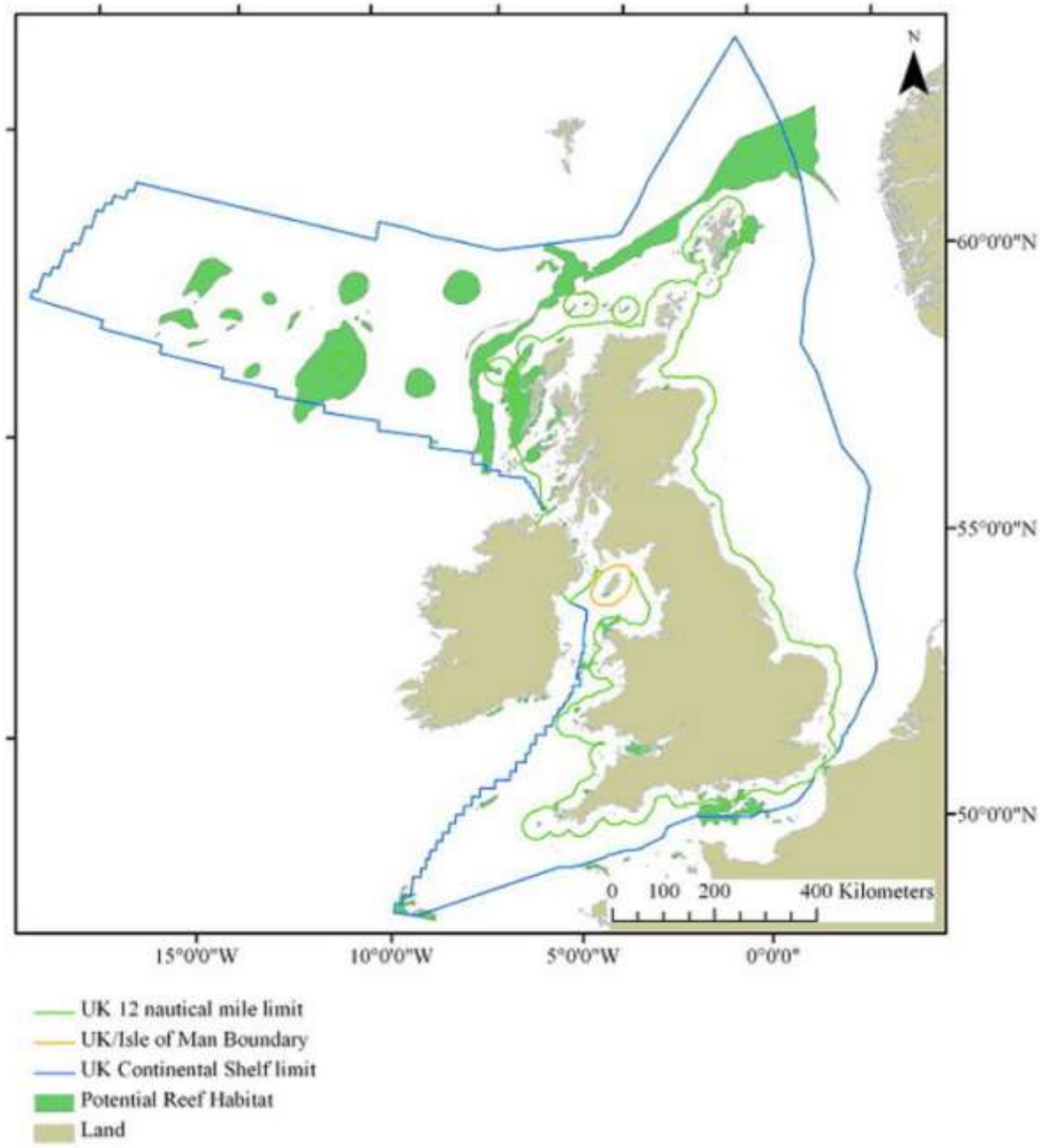

Figure 1.1 The distribution of bedrock and stony reef within UK offshore waters. Seabed habitat derived from BGS 1:250,000 seabed sediment maps © NERC and SeaZone bathymetry © British Crown and SeaZone Solutions Limited. All rights reserved. Products Licence No. PGA042006.003. The exact limits of the UK Continental Shelf are set out in orders made under section 1(7) of the Continental Shelf Act 1964 (© Crown Copyright). World Vector Shoreline © US Defense Mapping Agency. Map copyright JNCC 2008.

1.2 Rockall Bank

1.2.1 Site description

Rockall Bank is situated in the NE Atlantic Ocean 400km west of the Outer Hebrides. It forms part of the larger Rockall Plateau comprising Hatton Bank on the western side of the

plateau, Rockall Bank on the eastern side and George Bligh Bank on the northern side (Figure 1.2). Rockall Bank itself is approximately 450km long running NE to SW and 200km wide at its widest point. It ranges in depth from 0 to 1000m. The eastern and north eastern edge of the bank falls away very steeply from 250m descending the Rockall Trough at 1000-1500m. The western and southern slopes are less steep and descend into the Rockall-Hatton Basin at around 1000m. The seabed on Rockall Bank is thought to show a gradual transition from rocky outcrops around Rockall itself, through low rock ridges or boulder fields partly covered in coarse carbonate sand, to an almost complete cover of fine carbonate sand (Blacker, 1982). Current flow on and around Rockall Bank is cyclonic. Model data suggest bottom currents of between 2 and 6cms-^{1} at 200m depth on the bank summit, with stronger currents over the south-western (~9cms-^{1}), eastern and north eastern (up to ~13cms-^{1}) slopes of the bank (New & Smythe-Wright, 2002).

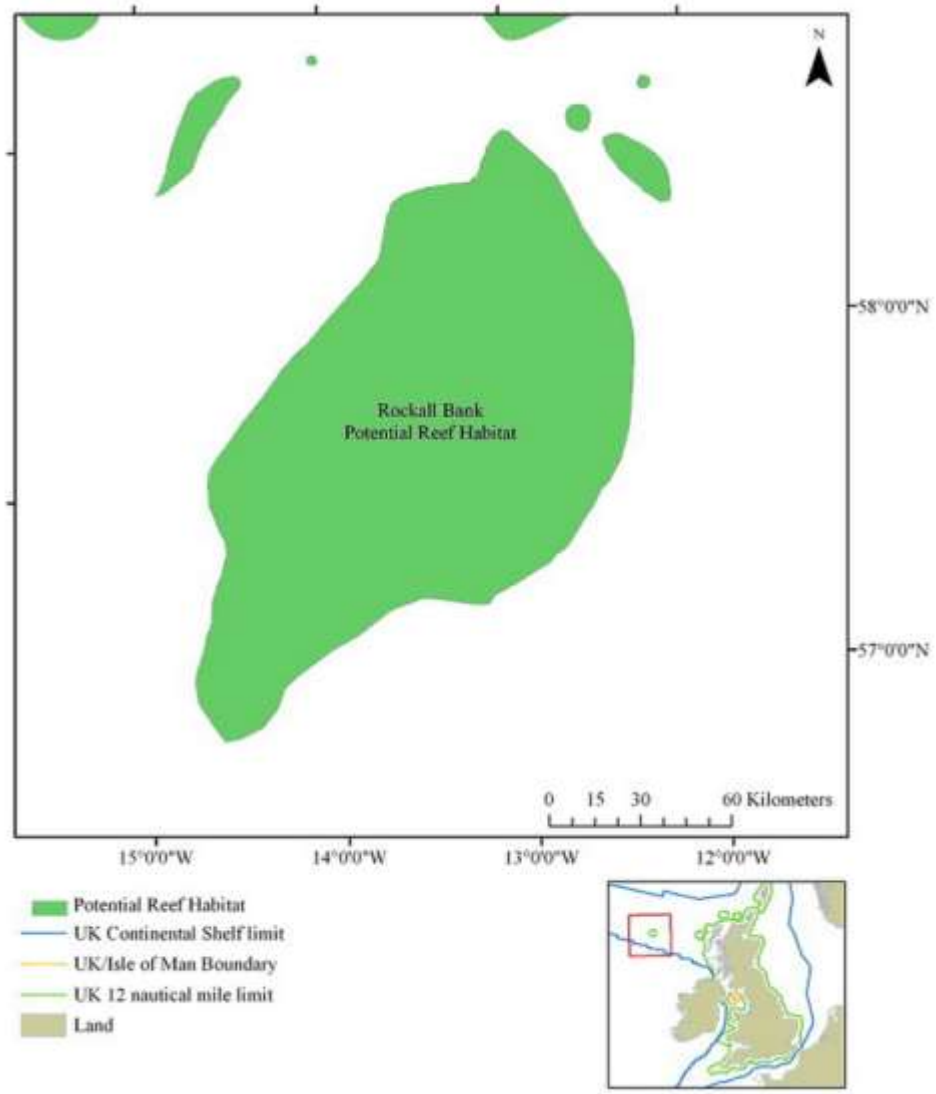

Figure 1.2: Location of Rockall Bank. Seabed habitat derived from BGS 1:250,000 seabed sediment maps © NERC and SeaZone bathymetry © British Crown and SeaZone Solutions Limited. All rights reserved. Products Licence No. PGA042006.003. The exact limits of the UK Continental Shelf are set out in orders made under section 1(7) of the Continental Shelf Act 1964 (© Crown Copyright). World Vector Shoreline © US Defense Mapping Agency. Map copyright JNCC 2008.

1.2.2 Human impacts

Fishing has probably been taking place on Rockall Bank for more than two centuries (Blacker, 1982). Initially species such as cod, haddock and halibut were targeted on the shallower parts of the bank; however since the 1970s, Russian, German and French trawlers have exploited blue ling, roundnose grenadier, black scabbardfish and deepwater sharks. Hake, blue whiting and Monkfish have also been exploited for a number of years and a small Nephrops fishery has also developed. Fishing now occurs to a depth of 1500m on Rockall Bank (FRS pers comm.).

Rockall Bank is currently not exploited for oil and gas although exploration of the area was undertaken by a consortium of oil and gas companies (Rockall Consortium) in the mid 90s.

1.2.3 Previous research

The area to the NW of Scotland, where the majority of the UK reef resource is located, incorporates one of the most studied deep-sea areas in the world. The Rockall Trough has a long history of exploration dating back to 1868 and the birth of deep-sea research. In recent years several major research programmes have targeted the area. These include the Land Ocean Interaction Study – Shelf Edge Study (LOIS-SES) transect on the Hebrides Slope (Mitchell *et al*, 1997), the Scottish Association for Marine Science's Station "M" (Gage 1986), the Benthic Boundary Layer Experiment (BENBO) (Hughes & Gage 2004), stations sampled during the AFEN 1998 survey (AFEN 2000) and stations in the Enterprise (Jones *et al*, 1998), Statoil and Agip (Black 1998) blocks (NW Hebrides). As a result there is a great deal of existing data on the ecology of this region. However, nearly all of the available data is from soft sediment habitats and is focused on the continental slope.

This bias of available data for soft sediment habitats is a result of the difficulty in sampling rocky areas in deep-water. Previously geological coring was the principle method of obtaining samples from deep-water rock habitats. However, advances in technology now allow the use of video, photography, ROV and submersible observation of deep-water rock habitats. Geological sampling of Rockall Bank has demonstrated the presence of a variety of sediment types on the bank summit including basalt and metamorphic basement (Hitchen *et al*, 2002). Observations by Wilson (1979), from the submersible PISCES, revealed the presence of cold-water coral communities down to 1000m depth consisting of *Lophelia pertusa*, *Madrepora oculata*, coral debris and an associated fauna. The coral colonies and thickets were observed to be scattered around the shallower parts of the bank from 150-400m depth with large reef structures found below 500m on the eastern flank. Since those early observations the presence of extensive cold water coral reefs on Rockall Bank have been further confirmed through the discovery of the Logachev Mounds and Western Rockall Bank Mounds (Kenyon *et al*, 2003)

1.3 The present study

Bedrock, stoney and biogenic reef have been recorded previously on Rockall Bank (Wilson, 1979; Hitchen *et al*, 2002). These habitats are of conservation interest and areas that support these habitats may be suitable for notification as SACs. In order to assess suitable areas of Rockall Bank against the SAC selection criteria, new survey of the area was required.
Aim: To confirm the presence and map the distribution of Annex I reef habitat on Rockall Bank and to propose possible boundaries for SACs.

2 Methodology

2.1 Research cruises

Between July and September 2006, four cruises were undertaken in the area of interest. Two were under the auspices of the Department of Trade and Industry's (DTI) Strategic Environmental Assessment (SEA) survey of the UK territorial seabed in SEA region 7 (the area to the North and West of Scotland), using the commercial research vessel *Kommandor Jack* (Figure 2.1). Two were undertaken as part of a routine survey by the Fisheries Research Services (FRS) Marine Laboratory using FRS's research vessel *Scotia* (Figure 2.2) with participation by JNCC and the University of Plymouth.

Figure 2.1: The *RV Kommandor Jack*. Image used with kind permission of Fugro OSAE GmbH.

Figure 2.2: The *RV Scotia*. Image used with kind permission of FRS Marine Laboratory © Crown Copyright.

The first cruise (DTI) took place in July and was focused on broad-scale geophysical survey of the region using predominantly a multibeam acoustic system, but with some sidescan sonar lines. On Rockall Bank a single long transect was run almost along the 57°30' parallel using the 500 kHz sidescan sonar. The transect started on the western margin at a depth of ~350m crossing to the eastern margin and finish at the 350m contour. Multibeam survey of large sections of the eastern margin (summit and flanks) was also undertaken (Figure 2.3). The data from this geophysical survey was used to identify target locations for the biological survey effort.

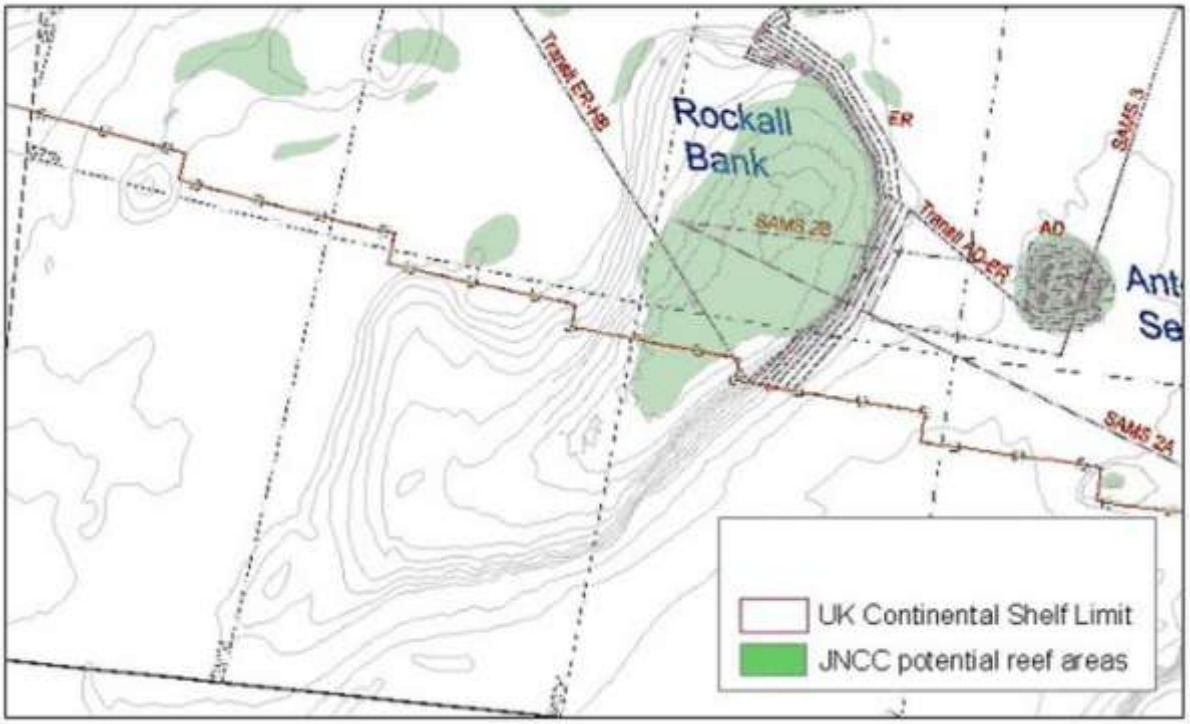

Figure 2.3: Multibeam and sidescan survey lines. Seabed habitat derived from BGS 1:250,000 seabed sediment maps © NERC and SeaZone bathymetry © British Crown and SeaZone Solutions Limited. All rights reserved. Products Licence No. PGA042006.003. Bathymetry © GEBCO Digital Atlas, British Oceanographic Data Centre on behalf of IOC and IHO 1994 & 1997. The exact limits of the UK Continental Shelf are set out in orders made under section 1(7) of the Continental Shelf Act 1964 (© Crown Copyright). Map copyright JNCC 2008.

Biological survey using video and photography was undertaken in August 2005 (DTI) and September 2005 and 2006 (FRS/JNCC) (Figure 2.4). A total of 53 stations were sampled on Rockall Bank over a depth range of 141-1600m, collecting approximately 30 hours of video footage and 780 images (Appendix 1). The length of tow varied from 8 minutes to 3 hours. Three different photographic systems were used to collect still and video images; Seatronics drop frame camera system on the *Kommandor Jack* (SEA7 stations) (Figure 2.5); FRS built drop frame and sledge systems on *Scotia* (Figures 2.6 and 2.7) (FRS/JNCC stations).

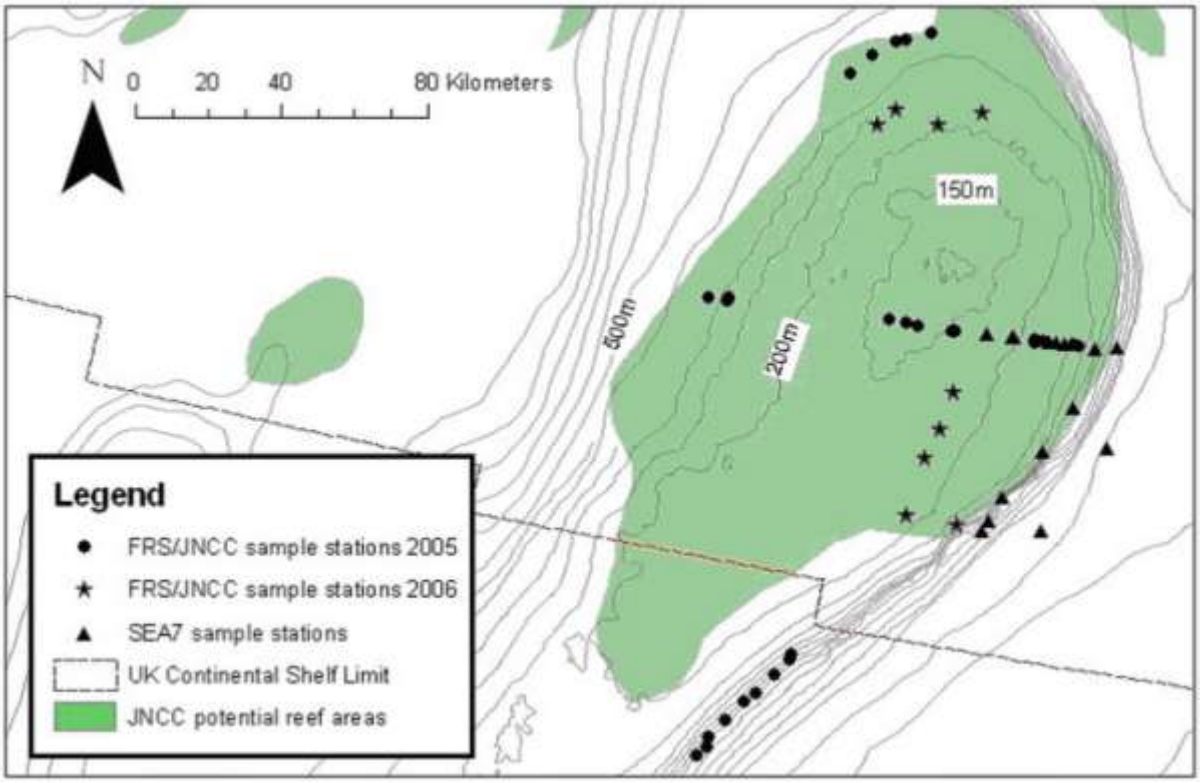

Figure 2.4: Sample stations. Seabed habitat derived from BGS 1:250,000 seabed sediment maps © NERC and SeaZone bathymetry © British Crown and SeaZone Solutions Limited. All rights reserved. Products Licence No. PGA042006.003. Bathymetry © GEBCO Digital Atlas, British Oceanographic Data Centre on behalf of IOC and IHO 1994 & 1997. The exact limits of the UK Continental Shelf are set out in orders made under section 1(7) of the Continental Shelf Act 1964 (© Crown Copyright). Map copyright JNCC 2008.

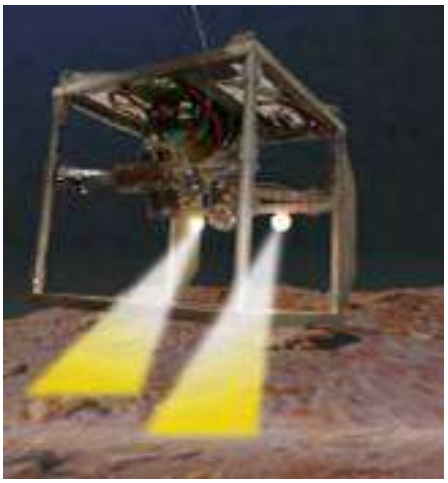

Figure 2.5: Seatronics drop frame camera system. Image courtesy of K. L. Howell.

Figure 2.6: FRS drop frame camera system. Image courtesy of K. L. Howell.

Figure 2.7: FRS video sledge system. Image courtesy of K. L. Howell.

2.2 Equipment

The Seatronics drop frame system was deployed from the side of the vessel. It comprised an integrated DTS 6000 digital video telemetry system which streamed real time video to the surface and 5 mega pixel digital stills camera (Kongsberg and Imenco) mounted at an oblique angle to the seabed. Sensors monitored depth, altitude and temperature, and a USBL beacon provided the position of the camera throughout the tow. The size of the field of view was unknown as no scaling device was used.

The FRS drop frame system was deployed from an A-frame at the stern. It comprised a separate video (Kongsberg-Simrad 14-366 Colour Zoom Camera 1/2" CCD 560 Lines Resolution) and stills camera (Benthos 35mm Model 378 (2005) Kongsberg digital still camera (2006)), both mounted looking vertically down at the sea bed. A 10 cm diameter drop weight attached to the frame via a 1m length of rope acted as a scaling device and an indicator of the ideal distance off the sea bed for taking stills images (camera in focus, lighting optimal). An altimeter and depth gauge provided additional data. No USBL beacon was available and as a result all raw navigation data are ships position. The size of the field of view at 1m off the sea bed was calculated as approximately 1.2 m^2 (1.35 x 0.9 m).

The FRS sledge system was also deployed from an A-frame at the stern of the vessel. The sledge system used the same video and stills camera as the FRS drop frame system although on the sledge both were mounted at an oblique angle making the field of view trapezoid in shape. The size of the field of view was constant but of unknown area as no scaling device was used.

2.3 Sampling

For SEA 7 stations, where possible, images were taken when the camera frame was touching the sea bed, however exceptions were, 1) when the substratum was extremely soft (silt clouds formed on contact with the seabed) and 2) when the substratum was extremely rocky, uneven, or descending a cliff face. Images were taken of areas or species of interest. No consistent sampling protocol was adhered to. For FRS/JNCC stations the drop frame was towed in the water column just off the sea bed. Where possible, images were taken when the drop weight just touched the sea bed (i.e. camera 1m off the sea bed). The sledge was towed on the sea bed. For the most part images were taken every 2 minutes, where major habitat changes occurred, and where items of interest were observed. However, logistical problems meant this was not always achievable for each station, and for stations sampled in 2006 recurring problems with the digital still camera meant few images were taken. Stations with the prefix DW were part of an FRS TV survey for *Nephrops norvegicus* burrows in this region for which the towed sledge was required. As a result the sampling protocol for these samples differs in that images were only taken where appropriate for the *Nephrops* survey. However, the video samples did provide useable information on habitats in this region of Rockall Bank and thus were incorporated into this project.

2.4 Data analysis

For all images substratum type was initially classified using level 3 of the deep-sea section of the EUNIS Habitat Classification system, with the exception of *Lophelia pertusa* reef and rubble areas, which was assigned to the appropriate level 5 category (A6.611). Substratum type was assigned to the EUNIS level 3 classes of mud, sand, mixed substrates and rock based on visual inspection with reference to the Wentworth Scale (Wentworth, 1922). The EUNIS level 3 class 'muddy sand' was not used as it was not possible to consistently distinguish 'muddy sand' from 'sand' or 'mud' by eye. The rock class was further divided into outcrop (raised above the seabed), bedding rock (at seabed level and/or with thin sand veneer) and boulders on the seabed (existing class at level 4 in EUNIS). The mixed substrate class was arbitrarily divided into a further 6 classes based on sediment size class composition (eg. pebble and cobbles on sandy substrata, boulders and cobbles on sandy substrata). These additional divisions were made in an attempt to more clearly describe the range of physical habitats, and to provide classes that corresponded to the Annex I bedrock and stony reef habitats. The resulting 13 physical habitat types (substratum classes) were used as the basis for all further biological data analysis (Table 2.1).

Table 2.1: Predefined physical habitat types and their relationship to existing EUNIS classes and Annex 1 reef subtypes.

Habitat	Code	EUNIS equivalent	Annex I reef subtype
Mud	MUD	A6.5 Deep-sea mud	N/A
Sand	SAND	A6.3 Deep-sea sand	N/A
Biogenic gravel	BIOG	A6.22 Deep-sea biogenic gravels	N/A
Pebbles on sandy substrata	POS	A6.2 Deep-sea mixed substrata	N/A
Pebbles and cobbles on sandy substrata	PACOS	A6.21 Deep-sea lag deposits	N/A
Cobbles on sandy substrata	COS	A6.2 Deep-sea mixed substrata	Stony reef
Boulders and cobbles on sandy substrata	BCLS	A6.2 Deep-sea mixed substrata/ A6.14 Boulders on the deep-sea bed	
Boulders on sandy substrata	BOS	A6.14 Boulders on the deep-sea bed	N/A
Exposed bedrock	BDRK	A6.11 Deep-sea bedrock	Rocky reef
Rock outcrop	RCOC	A6.11 Deep-sea bedrock	
Lophelia pertusa reef	COR	A6.611 *Lophelia pertusa* reefs	Biogenic reef
Lophelia pertusa rubble	CORRUB	A6.611 *Lophelia pertusa* reefs	Indicative of biogenic reef
Lag-gravel and sand banding	MEGR	A6.21 Deep-sea lag deposits	N/A

Within this study the following definitions have been used to identify reef subtypes, the corresponding substratum class is identified in brackets:

- biogenic reef: solid, massive structures and their associated debris fields, which are created by accumulations of organisms, usually rising from the seabed, or at least clearly forming a substantial, discrete community or habitat which is very different from the surrounding seabed. The structure of the reef may be composed almost entirely of the reef building organism and its tubes or shells, or it may to some degree be composed of sediments, stones and shells bound together by the organisms (adapted from the UK marine SACs website, http://www.ukmarinesac.org.uk/biogenic-reefs.htm) (COR, CORRUB);
- bedrock reef: submarine rock (>boulder) substrate supporting epibiotic communities (BDRK, RCOC);
- stony reef: boulder and/or cobble substrate supporting epibiotic communities (BCLS, COS).

Video tows were reviewed and major changes in pre-defined substratum classes were identified and georeferenced. A minimum patch size of $2m^2$ (2x1m) was used identify a change in substratum class. Patch size was assessed by eye thus $2m^2$ should be considered an approximate size. The occurrence of Annex I 'reef' habitat (as defined above) was also identified and georeferenced. For the 2005 datasets still images were qualified according to pre-defined physical habitat types (substratum classes) and all visible species identified to lowest possible taxonomic level. Large megafaunal species were counted. Percentage cover

of hard substrata and encrusting species was estimated using a 10x10 grid overlain on the images.

Megafaunal count data obtained from image analysis was initially analysed separately for each of the 3 camera systems used. However as the FRS drop frame and sledge systems provided a similar size field of view (albeit from different perspective) and resolution of species identification, the data sets were combined and reanalysed to provide a more comprehensive assessment of each substratum class. Image data were grouped by pre-defined physical habitat type (substratum class). The SIMPER routine in PRIMER 5 was used to define characterising species of each substratum class. ANOSIM was used to examine whether pre-defined substratum classes were faunally distinct. In addition image data was grouped by annex I reef habitat subtype (biogenic, stony, rock) and SIMPER was used to define characterising species of each reef subtype (However see section 2.5 for limitation of data analysis). For each reef subtype an analysis of similarity (ANOSIM) was then used to assess differences in the faunal composition of reef subtypes between the spatially distinct regions of Rockall Bank sampled (see Appendix 1 for the division of stations between bank regions). Image data obtained in 2006 were few and of poor quality due to recurrent problems with the digital camera system. These images have been analysed qualitatively but were not used in quantitative analysis.

The distribution of Annex I 'reef' habitat was mapped as point data in GIS and analysed together with historical data on reef distribution and fishing effort to assess boundaries for a possible marine protected area (MPA).

2.5 Data limitations

2.5.1 FRS data set

For the 2005 data no USBL system was used, cable out reading was not available for four video tows (samples COR0501-05) and so layback could not be calculated. Ships heading was not recorded and therefore had to be calculated from GIS in order to calculate layback. Latitude and longitude was only recorded to three decimal places, which was inadequate for mapping purposes. Positional data had to be artificially separated in order to display the tow track. The resolution of the images from the benthic camera system used was inadequate for the identification of encrusting species. In addition many images were lost in processing the 35mm film. Field of view of the sledge was not calibrated, preventing the calculation of species abundance from sledge data. For the 2006 data again no USBL system was used although cable out, ships heading and bearing were recorded in order to allow calculation of layback. The digital camera system frequently malfunctioned resulting in few images available for species analysis.

2.5.2 SEA7 data set

USBL beacon malfunctioned on a number of tows where no back up A-frame position was recorded. Where A-frame position was recorded cable out and ships heading were not, preventing the calculation of layback and corrected plotting of tow track in GIS. Field of view of the camera was not calibrated, preventing the calculation of species abundance. Video system used was of poor quality making analysis difficult and time consuming. No consistent sampling protocol was adhered to. Images were taken where there was something of interest rather than in a stratified random manor. Thus the data produced from image

analysis was heavily biased toward coral habitats and other 'visually pleasing' species, proving an inaccurate assessment of characterising species within a habitat type and the composition of the benthic faunal community. However it should be noted that the images were excellent for species identification.

2.5.3 General comments

Both data sets were not comparable as the size of the field of view and the distance travelled within a tow was of a different order between surveys (see Appendix 1). Identification of encrusting species, although more achievable from the SEA7 dataset, was still largely impossible without physical samples on which to base observational interpretation. Direct mapping of video data onto sidescan sonar data and the production of habitat polygons was not possible as a result of poor positional accuracy achieved in these surveys.

3 Results

3.1 Acoustic analysis

Ground truth targets are given in Table 3.1.

Table 3.1: Ground truth target sites from acoustic analysis

Station	Target	System
ER-A	Typical shelf (south)	EM120
ER-B	Typical upper slope (south)	EM120
ER-C	Upper drift (top)	EM120
ER-D	Upper drift (base)	EM120
ER-E	Typical mid slope (south)	EM120
ER-F	Slide scar (recent)	EM120
ER-G	Slide deposits	EM120
ER-H	Typical shelf (north)	EM120
ER-J	Typical upper slope (north)	EM120
ER-K	Typical mid slope (north)	EM120
ER-L	Channel bank deposits	EM120
SAMS2_A	Potential reef, W Rockall Plateau	500kHz
SAMS2_B	Potential reef, W Rockall Plateau	500kHz
SAMS2_C	Potential reef, W Rockall Plateau	500kHz
SAMS2_D	Potential reef, W Rockall Plateau	500kHz
SAMS2_E	Potential reef, W Rockall Plateau	500kHz
SAMS2_F	Potential reef, W Rockall Plateau	500kHz
SAMS2_G	Potential reef, W Rockall Plateau	500kHz
SAMS2_H	Iceberg plough-marks, W Rockall	500kHz
SAMS2_J	Potential reef, W Rockall Plateau	500kHz
SAMS2_K	Potential reef, W Rockall Plateau	500kHz
SAMS2_L	High backscatter sheet E Rockall Plateau	500kHz
SAMS2_M	Outcrop/Reef, E Rockall Plateau	500kHz
SAMS2_N	Potential reef, E Rockall Plateau	500kHz
SAMS2_O	Potential reef, E Rockall Plateau	500kHz
SAMS2_P	Potential reef, E Rockall Plateau	500kHz

3.1.1 High resolution sidescan sonar

(The following are taken from Jacobs (2006))

From the start of the 500kHz transect to about 350m water depth, which occurs at about 57°28'N 14°46'W there are low intensity backscatter plough-marks and numerous drop-stones. Over the next few miles to the east the plough-marks, usually with a distinct infill in their centre furrow, become much more highly backscattering and numerous targets (potential coral reef areas) are seen. The plough-marks are mostly 20-40m wide, with CHIRP profiles showing they are generally ~5m deep, with some up to ~10m. Between 290m at 14°40'W and 240m at 14°32W the CHIRP profiles show that most of the seafloor is now a gently sloping feature with just a few undulations in the surface. Further east at 180m (14°15'W) the

plough-marks are very well imaged and show that many contain potential biological (reef) structures (Figure 3.1).

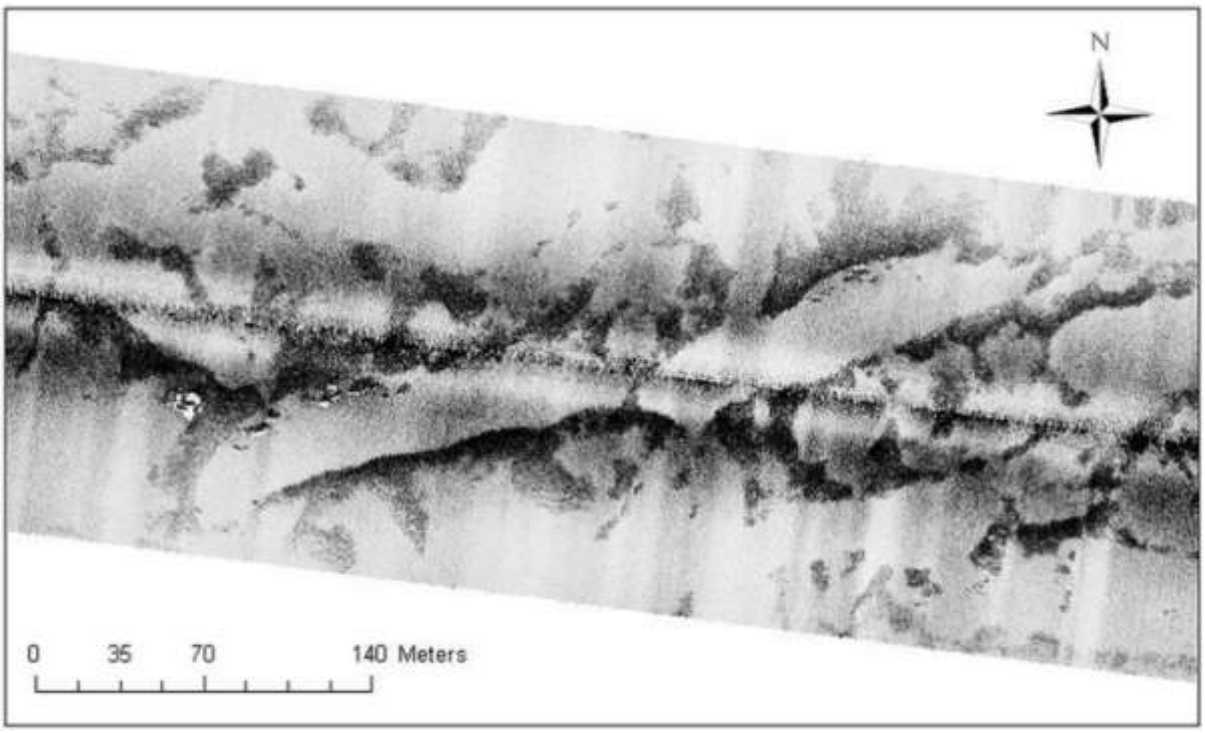

Figure 3.1: Plough marks and potential biological mounds on western Rockall Bank. Sidescan sonar data obtained from the Department of Trade and Industry Strategic Environmental Assessment 7, 2005. (© BERR).

Toward the 150m contour at 14°03'W is an extensive zone of increasing higher backscatter toward the east, along with increasing signs of current activity such as ripples and possible small sand dunes, and current-parallel lineations. The plough-marks virtually disappear as do the 'biological' targets. East of 14°W where the depth is ~130m, current features are indicative of a north-south flow direction, and trawl marks become more evident. High backscatter become the dominant seafloor type further east, by 13°25' and at a depth of ~180m, forming linguoid-barchan shapes (Figure 3.2.).

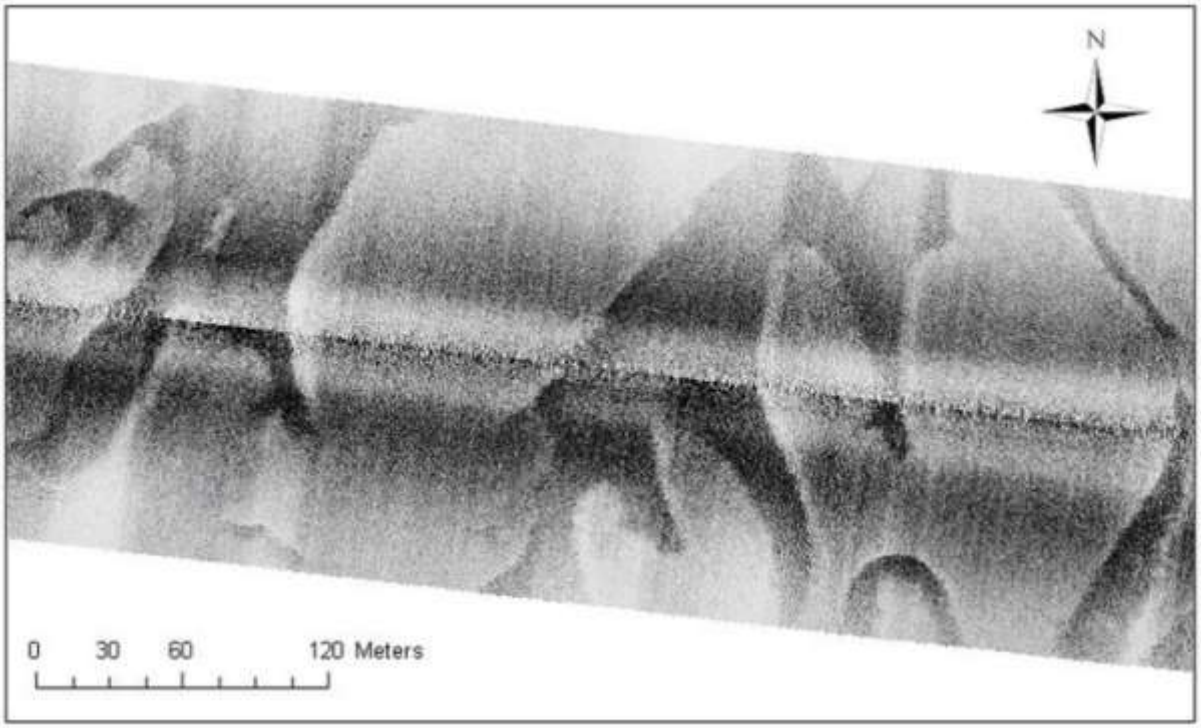

Figure 3.2: Linguoid-barachan high backscatter sheets on Rockall Bank. Sidescan sonar data obtained from the Department of Trade and Industry Strategic Environmental Assessment 7, 2005. (© BERR).

By 13°22'W as the shelf deepens to 190m there is a return to alternating high and low backscatter sheets, often with intricate inter-fingering boundaries as they mix with and overlie each other. There is a very distinctive zone interpreted as outcrop at 200m water depth, ~13°20'W, in the general area of high and low backscatter. There are no identifiable pinnacles or other obvious non-geological features present on these outcrops. The low backscatter areas separating each outcrop vary between 80 and 200m in width, and each of these areas has its own ornament of high-backscatter "streams" of 5-20m in width that are orientated NE-SW. By 13° 18W plough-marks once again dominate the seafloor below 210m., though on this eastern flank they appear much degraded by current activity. These plough-marks seem to be partially masked by lower backscatter zones which contain individual high backscatter blocks 2-4m in size, often with some relief. Many of these blocks have halos of very high backscatter material around them suggesting coarser material around a central block and thus are potential reef targets. These types of features were seen to the eastern end of the 500kHz survey at 350m water depth.

3.1.2 Multibeam

(The following are taken from Jacobs (2006))

A brief initial interpretation is presented of this region, the narrative of which runs from the UK-Ireland boundary in the south toward the north. Beneath the shelf-break at about 350-400m, the upper slope drops away quite steeply to 550-600m with the slope itself incised with bights up to several kilometres across and hundreds of meters deep spread at intervals, though more especially focused south of 56°55'N. At approximately 1-1.5km from the foot of the upper slope is the crest of a sediment drift standing 100-150m above the moat that runs between it and the actual slope edge. The crest of the sediment drift occurs at between 550-

650m, with the contours showing for the most part an even slope down to 1100m, where the contours show a 100m vertical drop. This deeper step change is more or less continuous through the area. Below this bathymetric step the contours show a generally smooth slope to the edge of coverage at approximately 1800-1850m.The exceptions to the above description are a discontinuous gully, approximately 50m deep, that runs from NW to SE across the slope between the sediment drift at 500m down to 1600m; and a sediment slide, whose slip-plane is centred at about 56°44'N 13°39W. The area affected is only 4km in width; the other features of note are a few small scours, of the order of 1km across, occurring almost exclusively below 1100m. The backscatter reveals many iceberg plough-marks on the shelf area of Rockall Bank, with the upper slope showing a number of areas of high backscatter that are correlated with incisions/valleys.

The surface of the upper sediment drift shows a uniform level of backscatter, though there are subtle patterns suggestive of down-slope depositional events such as small-scale sediment flows or slides. South of 56°47'N 13°30W there are two higher-backscatter areas with structures, textures and shapes indicating that they may be the remnants of old slope failures, confirmed by the CHIRP profiles. Towards the north the crest of the sediment drift deepens to 750m, and there are more small scale sediment slips degrading the upper sediment drift. These are mostly of the order of 1-3km in breadth, the largest being 5km wide centred at 57°18N 13°00W. Below the 1100m depth of the step, north of 57°00N, there are many more backscatter indications of down-slope sediment failure and transport, confirmed by examination of the CHIRP data which show degraded (eroded surface) sediment slide deposits.

Around 57°22N is where the orientation of the Rockall margin changes from largely NE-SW to NNE-SSW, with the upper slope now extending from the shelf-break to 700-750m, with in some places the slope dropping by 200m vertically in just 150m laterally, however these steep slopes are only encountered between 400-750m. Another major effect of this change in orientation is the disappearance of the well defined upper section of the sediment drift. Small slope failure scars are common, and are imaged near the two largest canyons along the margin (Figure 3.3). Both canyons are of the order of 100m deep and appear to almost define the boundaries of an area of slope that exhibits many small slope parallel ridges, perhaps indicating past instability. Both of the canyons are on close proximity to small failure scars (old and new) and it may be suggested that the canyons have actually developed from previous slope failure events and neither canyon is traceable to the top of the continental slope.

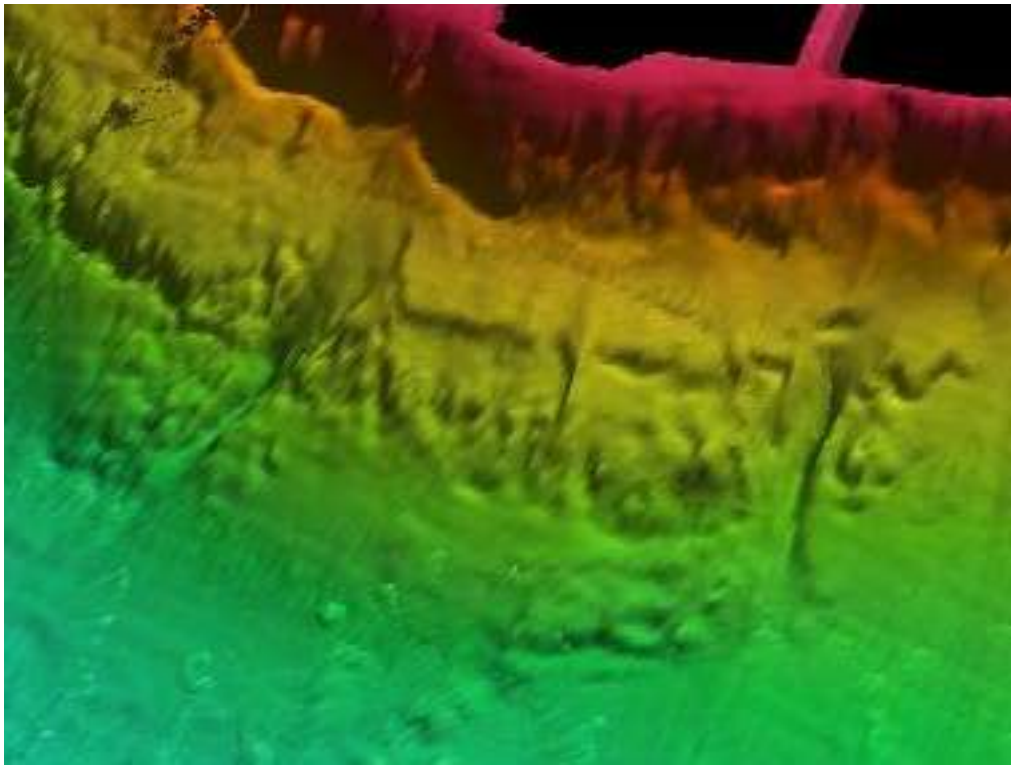

Figure 3.3: Canyons and landslides illustrated with shaded relief on the East Rockall margin showing typical textures indicative of sediment slides. Multibeam data obtained from the Department of Trade and Industry Strategic Environmental Assessment 7, 2005. (© BERR).

Between the two canyons described above the seafloor exhibits a generally higher level of back scatter than elsewhere in this area, and also especially over the immediate areas of both the canyons, the backscatter shows the distinctive down-slope patterns indicative of slide deposits (Figure 3.4). As the Rockall margin orientation moves from NNE-SSW to through to NW-SE the shelf edge is at approximately 350m and the upper slope is again extremely smooth. There are few features presumably because the strong currents in this region are eroding all sharp edged features. As the shelf curves further toward the west the shelf break effectively disappears, the distance from the 500m contour down to the 950m isobath becoming a broad (7km) smooth slope. The upper part of the slope does however retain the iceberg plough-marks and the eroded embayments and bights that characterise the rest of the Rockall Bank shelf and margin further to the south.

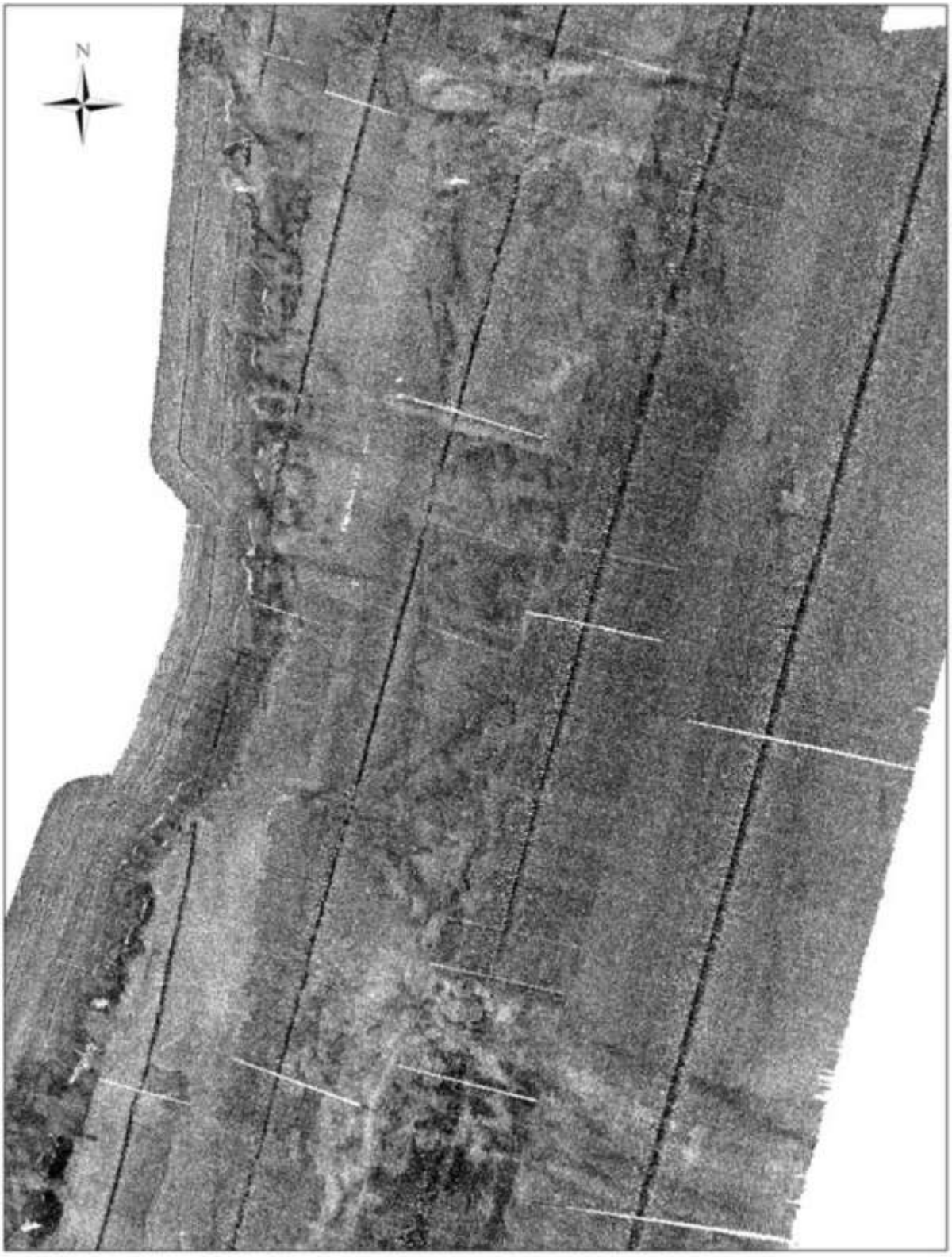

Figure 3.4: Backscatter mosaic over the area of canyons on the East Rockall margin showing typical textures indicative of sediment slides. Multibeam backscatter data obtained from the Department of Trade and Industry Strategic Environmental Assessment 7, 2005. (© BERR).

One of the few features on the mid slope along this part of the east Rockall margin lay between 13°30' and 13°40'W, where the shaded relief shows a 5-10m topography on the

seabed surface and the backscatter shows a distinctive texture. This feature laid immediately down-slope from an embayment, and the CHIRP over this area shows that it is a now-buried and sculpted slide deposit.

At 58°21'N 13°42.5'W there is a small (1x2km) isolated pinnacle just over 100m in height, maybe a remnant part of the slide deposit or a distinct body such as an igneous intrusion.

The northern most part of the survey area lay in the saddle between George Bligh Bank and Rockall Bank and covers one of the entrances to the Hatton-Rockall basin. West of 14°W is a very complex area topographically, the northern slope of Rockall now becoming greatly extended and changed from all other areas. The shelf area is imaged at the limit of coverage at approximately 500m with a shelf edge parallel ridge running almost E-W at 520-580m (the crest is deeper toward the west). The whole of the slope down to over 900m is in fact now a series of stepped terraces, with the steps and terraces at various depths along the slope. There are a number of canyons running slope orthogonal, however there origins are below the shelf edge at 700m and they lose identity by 1000m.

Along this northern flank of Rockall Bank there is another significant curvature of the steepest part of the slope. At 13°55'W, it lay between 750-950m and trends west of north-west, by 14°00'W the steep slope has moved lower to 800-1000m, and by 14°05'W the trend has changed to north-west and the depth of the steepest slope is now 1000-1100M. Here, however, the foot of the slope has changed character completely. In a sweeping arc from 58°23'N 13°56'W through 58°26'N 14°00'W and 58°35'N 14°07'W the foot of the slope takes the form of a series of meander-like incised arcuate features, of between 60 and 120m in depth, these features are clearly imaged by both shaded relief and CHIRP.

Higher on the slope at 58°30'N 14°00'W, 58°28'N 14°08'W and 58°25'N 14°03'W appear to be the ghosts or remnants of previous meander-like incised areas, perhaps abandoned as an erosion moved progressively down-slope.

The backscatter in this area is quite surprising in that it shows very few features indeed. The iceberg plough-marks are still present on the shallowest parts of the coverage, but they are lost below 500m. The rest of the slope is an almost uniform intensity, apart from the banks of the highly meandering incised area at the base of the slope, and the areas indicated above that may be remnants of previous meandering incisions.

3.2 Video analysis

3.2.1 Rockall Bank SEA7 stations

SAMS_2_L#5 (164-165 m). Duration 41:00 minutes
EUNIS habitats: A6.4
Substratum class codes: SAND, BIOG

Image quality of this tow was poor in places with visibility frequently obscured by silt clouds raised by contact with the sea bed. In addition as a result of the inadequate lighting used for some of the tow, the video was difficult to view in places. Two substratum classes were represented within this tow and are given in order of frequency of occurrence: sand, biogenic gravel. The sand substratum class consisted of medium-coarse muddy sand (Plate 1) with evidence of some bioturbation, including: a few small mounds, animal tracks and faecal casts.

There was evidence of hydrodynamic activity with both type 3 and 4 ripple patches (not greatly abundant) and shell debris and detritus throughout.

Very few fauna were observed at this station, only the asteroids *Hippasteria phrygiana* and *Stichastrella rosea* (Plate 1), a small ophiuroid (possibly *Ophiactis balli*), and some gastropod shell debris.

SAMS_2_M#3 (181-189 m) Duration 35:00 minutes
EUNIS habitats: A6.3, A6.1, A6.11
Substratum class codes: BCLS, BDRK, PACOS, POS, RCOC

Image quality of this tow was poor in places, due to erratic movements, close proximity/focus of the camera and silt clouds caused from contact with sea bed. Five substratum classes were represented within this station and are given in order of frequency of occurrence: exposed bedrock, pebbles and cobbles on sand; rock outcrop, pebbles on sand, and boulders and cobbles on sand. The most common substratum class observed was exposed bedrock (Plate 2). Within this class, bedrock covered 50-100% of the sea bed with coarse sand, organic debris (*Cidaris* spines and brachiopod shells) and cobbles/pebbles covering the sea bed between. The pebbles and cobbles on sand substratum class (Plate 3) were composed of pebbles and cobbles covering 5-10% (patchy) of the underlying medium sand substratum. The final two substratum classes were much less frequently observed than the previous two. Within the boulders and cobbles on sand substratum class hard substrate covered 30-60% of the underlying medium sand substratum (Plate 4). The sand within the pebbles on sand substratum class was not heavily bioturbated (Plate 5).

Abundant epifauna were observed throughout both the 'bedrock outcrop' substratum class and 'coarse sand with boulders and cobbles' substratum class. The most common organisms observed were cup sponges (*Axinella* sp), erect and encrusting bryozoans (including *Reteporella* sp and cyclostome bryozoans), encrusting sponges and small coral (or possibly anemone) polyps. The mobile epifauna consisted largely of the squat lobster *Munida* sp and various asteroids including *Ceramaster granularis*, *Porania pulvillus* and *Henricia sanguinolenta*. Epifauna appeared less abundant in the 'medium sand' and 'medium sand with pebbles and cobbles' substratum classes. Stylasterid corals were also observed at this station.

SAMS_2_M#2 (184-188 m). Duration 23:00 minutes
EUNIS habitats: A6.3, A6.14, A6.11
Substratum class codes: BDRK, POS, PACOS, SAND

Image quality of this tow was poor in places with visibility frequently obscured by silt clouds raised by contact with the sea bed. In addition as a result of the inadequate lighting used for some of the tow, the video was difficult to view in places. There also seemed to be a discrepancy between the time at which the video ended (9:52), and the time at which the last photos were taken (continued until 10:03). Four substratum classes were represented within this tow and are given in order of frequency of occurrence: sand (Plate 6), pebbles on sand, pebbles and cobbles on sand (Plate 7), exposed bedrock (Plate 8). The most common habitat was medium sand, with evidence of some bioturbation, including a few small mounds and pits. The pebbles on sand substratum class was, in places, characterised by a small amount of organic debris (maximum coverage of <5%). The pebbles and cobbles on sand and sand covered bedrock substratum classes were not observed in the video. There was evidence of

some hydrodynamic activity with type 3 ripple patches (not greatly abundant) and shell debris and detritus throughout.

Very few fauna were observed in the medium sand substrate class only one asteroid, *Stichastrella rosea*. Most of the fauna observed were associated with the pebbles and cobbles on sand substrate class. Characteristic species included the squat lobster *Munida* sp and common encrusting forms such as encrusting sponges, bryozoans, serpulid worm tubes and unidentified encrusting species. The sand covered bedrock was characterised by small coral (or possibly anemone) polyps and encrusting sponges. Stylasterid corals were also observed at this station.

SAMS_2_O#4 (209-211 m). Duration 30:00 minutes
EUNIS habitats: A6.3, A6.14
Substratum class codes: BCLS, PACOS, SAND

Image quality of this tow was poor in places with visibility frequently obscured by silt clouds raised by contact with the sea bed. In addition, as a result of the inadequate lighting used for some of the tow, the video was difficult to view in places. Three substratum classes were represented within this tow and are given in order of frequency of occurrence: pebbles and cobbles on sand (Plate 9); sand (Plate 10), and boulders and cobbles on sand (Plate 11). The most common substratum class observed was the pebbles and cobbles on sand class, with the pebbles and cobbles covering <5% of the underlying medium sand substratum (patchy). Medium sand was the next most common substratum class observed, followed by the boulders and cobbles on sand class. The boulders and cobbles covered 5-20% (patchy) of the underlying medium sand substratum. Little evidence of hydrodynamic activity was observed at this station.

Very few fauna were observed within the 'pebbles and cobbles on sand' substratum class, although the asteroid *Hippasteria phrygiana*, the squat lobster *Munida* sp and solitary corals *Caryophyllia* spp were characteristic of this habitat (plate 11). Few fauna were observed within the medium sand substratum class with the asteroid, *Stichastrella rosea* and ophiuroids being present. The greatest abundance of fauna was associated with the boulders and cobbles on sand substratum class, characterised by the erect bryozoans (*Reteporella* sp and Cyclostome bryozoans) and globose and encrusting form sponges. Stylasterid corals were also observed at this station.

SAMS_2_N#1 (220-221 m). Duration 32:00 minutes
EUNIS habitats: A6.3
Substratum class codes: COS, SAND

Image quality of this tow was poor in places with visibility frequently obscured by silt clouds raised by contact with the sea bed. In addition as a result of the inadequate lighting used for some of the tow, the video was difficult to view in places. Two substratum classes were represented within this tow and are given in order of frequency of occurrence: sand (Plate 12), and cobbles on sand (Plate 13). Within the sand substratum class small mounds and pits were visible throughout and signs of current scour were visible in places. Within the 'cobbles on sand' substratum class the cobbles covered an area of <5% of the underlying medium sand substratum. There was evidence of some hydrodynamic activity with type 3 ripple patches (not greatly abundant) and shell debris present in both substratum classes.

Very few fauna were observed at this station, particularly within the 'medium sand' substratum class where the only organisms observed were two asteroids *Hippasteria phrygiana* and *Stichastrella rosea*. The most commonly observed mobile epifauna within the cobbles on sand substratum class were asteroids (*Stichastrella rosea, Hippasteria phrygiana, Henricia sanguinolenta* and *Astropecten irregularis*). A monk fish, *Lophius piscatorius* and an unidentified decapod (probably *Paramola* sp) were also noted. Other fauna were typical encrusting forms (sponges, bryozoans) although occasional globose form sponges were also visible.

SAMS_2_P#1 (237-240 m). Duration 25:00 minutes
EUNIS habitats: A6.3
Substratum class codes: COS, SAND

Image quality of this tow was poor in places with visibility frequently obscured by silt clouds raised by contact with the sea bed. In addition as a result of the inadequate lighting used for some of the tow, the video was difficult to view in places. There were two substratum classes observed within this tow. They are given in order of frequency of occurrence: sand (Plate 14) and cobbles on sand (Plate 15). The most common substratum class was composed of medium sand with evidence of bioturbation in the form of mounds, depressions, pits and detritus throughout. The cobbles on sand substratum class consisted of cobbles covering 10% of the underlying medium sand substratum. Signs of faunal activity in the form of mounds were also observed. There was some evidence of hydrodynamic activity within this tow.

Few fauna were observed at this station, particularly in the medium sand substratum class where a monk fish (*Lophius piscatorius*) was the only observed fauna. There was a greater abundance of fauna within the cobbles on sand substratum class including encrusting, globose and erect form sponges. Stylasterid corals were again visible at this station.

ER-O#1 (391-674 m) Duration 03:00:00 hours
EUNIS habitats: A6.11, A6.22, A6.14, A6.2
Substratum class codes: BCLS, COR, POS, PACOS, RCOC

Image quality of this long tow was fair. Visibility was frequently obscured by silt clouds raised by contact with the sea bed and fast and erratic movements of the camera made accurate faunal assessment difficult in places. Five substratum classes were represented within this tow and are given in order of frequency of occurrence: boulders and cobbles on sand, pebbles and cobbles on sand, pebbles on sand, rock outcrop, coral reef. The most common substratum class within this station was composed of areas of boulders with cobbles (Plate 16) covering between 20-100% of the underlying coarse sand substrate with an abundance of shell debris. The next most common (almost as abundant) substratum class was composed of areas of pebbles with cobbles (Plate 17) covering between 10-50% of the underlying coarse sand substrate with an abundance of shell debris. Pebbles (Plate 18) covered between 5-20 % of the underlying coarse sand/biogenic gravel substrate with an abundance of shell debris within the pebbles on sand substratum class. The least frequently observed substratum class was rock outcrop (Plate 19), with rock covering between 40-100% of the field of view within this class, and areas of cobbles on coarse sand substrate infilling between outcrops. Within each substratum class shell debris and clinker were abundant suggesting this area experiences a degree of hydrodynamic activity.

Fauna was abundant throughout the tow, although there were obvious differences in faunal composition of each substratum class. The echinoid *Cidaris cidaris* was ubiquitous in this tow. Within the boulder and cobbles substratum class the most commonly observed mobile epifauna were *C. cidaris*, squat lobsters (*Munida* sp), small ophiuroids (*Ophiactis* sp), the holothurian *Stichopus tremulus*, and fish. There were many sessile and encrusting forms on the boulders and cobbles including cup corals (*Caryophyllia* sp), encrusting sponges (at least six morphospecies), large erect sponges, and bryozoans. Stylasterid corals and *Lophelia pertusa* were also visible in places. The pebbles and cobbles on sand substratum class supported a similar mobile epifauna with *C. cidaris*, fish and asteroids present. Sessile and encrusting forms appeared less diverse with only encrusting sponges and bryozoans being frequently observed. Similar mobile epifauna were observed within the pebbles on sand and rock outcrop substratum classes, with *C. cidaris* and holothurians in both. Encrusting sponges and a large area of live *L. pertusa* was also observed.

ER-M#2 (401-621 m). Duration 01:28:00 hours
EUNIS habitats: A6.21, A6.2, A6.14, A6.22, A6.11, A6.611
Substratum class codes: BCLS, BDRK, COR, CORRUB, COS, POS, PACOS, RCOC

Image quality of this tow was good. Eight substratum classes were represented within this long tow and are given in order of frequency of occurrence: cobbles and pebbles on sand; boulders and cobbles on sand; exposed bedrock; pebbles on sand; cobbles on sand; coral reef; coral rubble; rock outcrop. The most common substratum class was cobbles and pebbles on sand with cobbles and pebbles covering between 10-40% of the underlying coarse sand substratum (eg. Plate 20). Areas of boulders and cobbles covering between 5-80% of the coarse sand substrate were the next most common substratum class observed (eg. Plate 21). An area of exposed bedrock was also visible within this tow although was not captured in the still images. A small clump of the reef forming coral *Lophelia pertusa* was also observed (Plate 22) with distinctive rubble areas bordering the habitat. At certain points within this tow a very unusual sediment type was observed within the images that had the appearance of compressed sand or deposited fine sediment. On the video these areas looked like bedrock and in places were interpreted as such. The coarse nature of the substratum within this tow suggested this area experienced a degree of hydrodynamic activity.

Commonly observed organisms within the coarse sand with cobbles and pebbles substratum class were mainly unidentifiable encrusting types (particularly bryozoans, at least five morphospecies of encrusting sponge) that covered between 5-30% of the exposed hard substratum. Serpulid worms were also characteristic (Plate 23). The boulder and cobble substratum class was again characterised by encrusting types (particularly bryozoans, and at least 14 morphospecies of encrusting sponge) with 50-80% of the exposed hard substratum covered. Serpulid worms, brachiopods and various anemones were also characteristic encrusting forms. The squat lobster *Munida* sp and large numbers of the small ophiuroid *Opiactis* sp were characteristic of the mobile epifauna present in this habitat. Massive-globose sponge forms, stylasterid and solitary corals were also notable. The small patch of *Lophelia pertusa* observed supported hydroids, encrusting sponges and a number of small ophiuroids (*Ophiactis* sp) within the dead reef interior. The unusual sea bed type classed as bedrock supported a very large number of ophiuroids (possibly *Ophiactis* sp).

ER-N#1 (406-639 m). Duration 02:40:00 hours
EUNIS habitats: A6.11, A6.22, A6.14, A6.2
Substratum class codes: BCLS, BDRK, POS, PACOS, RCOC

Image quality of this tow was reasonable although some of the associated photos were difficult to interpret as a result of lighting problems. Five substratum classes were represented within this tow and are given in order of frequency of occurrence: cobbles and boulders on sand, pebbles and cobbles on sand, exposed bedrock, rock outcrop, pebbles on sand. The most commonly observed substratum class consisted of cobbles and boulders covering between 5-100% of the underlying coarse sand substrate. Areas of cobbles, pebbles and organic debris (echinoid spines, brachiopod shells) (Plate 24), covering between 3-90% of the underlying coarse sand were the next most common substratum class (Plate 25) followed by areas of exposed bedrock and rock outcrop, with some patches of the pebbles on sand substratum class also present (Plate 26). The coarse nature of the substratum within this tow and the large amount of collected organic debris suggested this area experienced a degree hydrodynamic activity.

Commonly observed organisms within the cobble and boulder substratum class were mainly unidentifiable encrusting types (including encrusting bryozoans and 16 morphospecies of encrusting sponges) that covered between 10-80% of the exposed hard substratum. Other characteristic sessile species included solitary corals *Caryophyllia* spp, coral/anemone sp2 and serpulid worm tubes. Squat lobsters (*Munida* sp) were frequently observed within this substratum class and large numbers of small ophiuroids (possibly *Ophiactis balli*) were present, visible only as arms emerging from what appeared to be sand encrusted sponge. Stylasterid corals were also noted. The coarse sand with cobbles, pebbles and organic debris substratum class was again characterised largely by encrusting forms (including bryozoans and at least 10 morphospecies of encrusting sponges) with 10-60% of the exposed hard substratum covered. The pebbles on sand substratum class differed little, in terms of faunal composition, from the previous substratum class, however only three morphospecies of encrusting sponge were observed. The limited areas of exposed bedrock and rock outcrop observed within this tow were characterised by encrusting sponges and bryozoans as well as the echinoid *Cidaris cidaris*, cup sponges (probably *Axinella* sp), and corals including *Caryophyllids*, and *Madrepora oculata*.

ER-B#1 (551-582 m). Duration 31:00 minutes
EUNIS habitats: A6.21, A6.2
Substratum class codes: BCLS, POS, PACOS

Image quality of this tow was generally poor with visibility frequently obscured by silt clouds raised by contact with the seabed; visibility was also reduced due to the camera being too high off the seabed at times. In addition, as a result of the inadequate lighting used for some of the tow, the video was difficult to view in places. There were three substratum classes represented within this station, they are given in order of frequency of occurrence: pebbles and cobbles on sand; pebbles on sand, and boulders and cobbles on sand. The most common substratum type was pebbles and cobbles (Plate 27) covering between 20-60% of the underlying coarse sand and gravel substrate. Pebbles on sand (Plate 28), where pebbles covered 40% of the underlying coarse sand and gravel substrate, was the next most common substratum class, followed by the boulders, cobbles and pebbles (Plate 29) substratum class, where hard substrate covered between 20-60% of the underlying coarse sand and gravel. Within the latter substratum class the boulders were patchy in coverage with cobbles and

pebbles being more abundant. Clinker and organic debris were present throughout the tow, and pebbles and cobbles were slightly embedded in the substratum. The coarse nature of the substratum within this tow and the large amount of collected organic debris suggested this area experienced a degree of hydrodynamic activity.

As a result of the poor visibility, an accurate assessment of the epifauna could not be achieved from the video. The most commonly observed organisms were the echinoid *Cidaris cidaris*, the highest abundance occurring within the substratum class pebbles on sand. Fish were the next most commonly observed organisms including *Chimaera monstrosa* and grenadiers. All hard substrate was encrusted to a lesser or greater degree with organisms including sponges, bryozoans, hydroids and serpulid worm tubes. The pebbles on sand substratum class appeared to support a smaller number of species with encrusting bryozoans and serpulid worm tubes being characteristic. The pebbles and cobbles on sand substratum class (and most likely the boulders and cobbles on sand substratum class) appeared to support a greater number of species with at least seven morphospecies of encrusting sponge, occasional brachiopods, solitary corals, bryozoans, serpulid worm tubes and hydroids observed. Large numbers of ophiuroids (*Ophiactis* sp) were commonly observed positioned in the cracks and crevices among cobbles with just their arms visible and protruding into the water column.

ER-C#1 (645-657 m). Duration 30:00 minutes
EUNIS habitats: A6.3, A6.14
Substratum class codes: BCLS, POS, PACOS

Image quality of this tow was generally poor with visibility frequently obscured by silt clouds raised by contact with the seabed, with the camera moving erratically at times. In addition as a result of the inadequate lighting used for some of the tow, the video was difficult to view in places. Three substratum classes were represented within this station and are given in order of frequency of occurrence: pebbles and cobbles on sand (Plate 30), pebbles on sand (Plate 31), and boulders, cobbles and pebbles on sand (Plate 32). The most common substratum class was pebbles and cobbles on sand with pebbles and cobbles covering between 5-10% of the underlying coarse sand substrate with little evidence of bioturbation. Pebbles covering between 2-8% of the underlying coarse sand substrate with little evidence of bioturbation were the next most common substratum class observed. The least frequently observed substratum class was composed of sparse boulders with more abundant cobbles and pebbles, covering between 5-15% of the underlying coarse sand substrate, again with little evidence of bioturbation. The coarse nature of the substratum within this tow and the presence of the less prominent type 1 ripples (linear deposition of pebbles) suggested this area experienced a degree of hydrodynamic activity.

Epifauna were not abundant within this tow; an accurate assessment of abundance could not be achieved from the video due to poor visibility. The most commonly observed fauna was *Cidaris cidaris* and encrusting organisms. At least seven morphospecies of encrusting sponges were present on the cobbles and boulders, with serpulid worm tubes and encrusting bryozoans also characteristic. Ophiuroids (sp indet) were also of note.

ER-D#1 (731-736 m). Duration 30:00 minutes
EUNIS habitats: A6.3, A6.14
Substratum class codes: BCLS, POS, PACOS, MEGR

Image quality of this tow was generally poor with visibility frequently obscured by silt clouds raised by contact with the seabed. In addition as a result of the inadequate lighting used for some of the tow, the video was difficult to interpret in places. Four substratum classes were represented within this station and are given in order of frequency of occurrence: pebbles and cobbles on sand; pebbles on sand; boulders and cobbles on sand; and megaripples. The most common substratum class was composed of pebbles and cobbles covering between 5-15% of the underlying medium to coarse sand substrate (Plate 33). Areas of pebbles covering between 5-10% of the underlying coarse sand substrate (Plate 34) made up the next most commonly observed substratum class. Boulders and cobbles covering 15% of the underlying coarse sand substrate (Plate 35) composed the boulders in sand substratum class. Within this substratum class some coral (*Lophelia*) fragments covering less than 5% of the underlying substrate were observed (Plate 36). The nature of the substratum within this tow and the presence of the less prominent type 1 ripples (linear deposition of pebbles) and signs of current scour in places suggested this area experienced a degree of hydrodynamic activity, although small patches of detritus present in some areas suggested less activity (slower currents) than at the previous station.

Commonly observed fauna at this station were the echinoid *Cidaris cidaris* and grenadiers). The cobbles and pebbles on sand substratum class supported at least four morphospecies of sponge, encrusting bryozoans and other unidentified species. The boulders and cobbles substratum class supported more sessile forms including coral/anemone sp2, serpulid worm tubes and encrusting organisms. The pebbles on sand substratum class supported fewer visible epifauna.

ER-F#1 (1025-1029 m). Duration 42:00 minutes
EUNIS habitats: A6.4
Substratum class codes: MUD, COS

Image quality of this tow was poor due to visibility frequently being obscured by silt clouds raised by contact with the sea bed. At close range the video image also suffered from overexposure caused by excessive or badly-positioned lighting (image quality was better when the video camera was elevated higher above the bed). Two substratum classes were represented within this tow, mud, and cobbles on sand. The majority of the tow covered an area of medium to fine sandy mud (Plate 37) with some evidence of bioturbation including depressions and animal tracks, although these were not visible in any of the stills images. Little evidence of hydrodynamic activity was observed. Small areas of cobbles on sand substratum class (Plate 38) punctuated the otherwise continuous habitat.

Few fauna were observed at this station. However, the most commonly observed organisms within the mud substratum class included xenophyophores with associated *Galathea* sp squat lobsters, the sponge *Pheronema carpenteri* and anemones (possibly *Bolocera tuediae*). Solitary corals (*Desmophyllum* sp) and small clumps of reef forming corals *Lophelia pertusa* and *Madrepora oculata* were occasionally visible although no reef structure was present. Within the areas of cobbles on sand burrowing anemones were frequently observed.

ER-L#1 (1124-1129 m) Duration 24:00 minutes
EUNIS habitats: A6.5
Substratum class codes: MUD

Image quality of this tow was extremely poor. For almost the entire duration of the tow observations of the sea bed were hindered by silt clouds raised from contact of the camera with the seabed, and by excessive lighting. The only substratum class observed was fine mud with some bioturbation and lebenspurren in the form or burrows and mounds (Plate 39). Few fauna were observed within this station, although evidence of infaunal activity was clear, with tubes/siphons observed protruding the sediment surface.

ER-G#1 (1546-1553 m). Duration 26:00 minutes
EUNIS habitats: A6.5
Substratum class codes: MUD

Image quality of this tow was poor in places with visibility frequently obscured by silt clouds raised by contact with the sea bed. In addition as a result of the inadequate lighting used for some of the tow, the video was difficult to view in places. A single substratum class was observed within this tow composed of fine mud with evidence of bioturbation including animal tracks, depressions, faecal casts, mounds and burrows (Plate 40). Little evidence of hydrodynamic activity was observed. A large boulder was present within the tow.

Very few fauna were observed at this station only occasional fish and ophiuroids. No organisms were present in any of the images taken. It is likely the majority of the biomass in this area is infaunal.

ER-E#4 (1598-1600 m). Duration 12:00 minutes
EUNIS habitats: A6.5, A6.14
Substratum class codes: BOS, MUD

Image quality of this tow was generally poor with visibility frequently obscured by silt clouds raised by contact with the seabed, with the camera moving erratically at times. In addition as a result of the inadequate lighting used for some of the tow, the video was difficult to interpret in places. Two substratum classes were represented within this station and are given in order of frequency of occurrence: fine mud (Plate 41) and boulders on sand (Plate 42). The most common substratum class consisted of fine mud with some bioturbation including *Nephrops* burrows (not highly abundant). The other substratum class present was composed of a single boulder on the underlying mud substratum. This has been classed as a separate habitat despite only one large boulder being observed as the faunal composition of the boulder was very different to the surrounding fine mud habitat. Little evidence of hydrodynamic activity was observed.

Few fauna were observed at this station and only two images were taken. A single Brisingid asteroid (possibly *Freyastera* sp) was visible on the fine mud habitat. The boulder supported fauna typical of hard substrata including hydroids, at least nine morphospecies of encrusting sponges, encrusting bryozoans, brachiopods and a number of small ophiuroids (*Ophiactis* sp) positioned in the cracks in the boulder.

3.2.2 Rockall Bank FRS/JNCC stations 2005

COR0510 (141m) Duration 20:00 minutes. Drop frame system
EUNIS habitats: A6.3, 6.11
Substratum class codes: BCLS, RCOC, PACOS, SAND, MEGR

Image quality of this tow was poor with visibility frequently obscured by silt clouds raised by contact with the seabed. In addition the camera elevation high above the seabed, poor lighting and erratic camera movements made it difficult to interpret the video. Five substratum classes were represented within this tow and are given in order of frequency of occurrence: Pebbles and cobbles on sand, sand, rock outcrop, boulders and cobbles on sand, and megaripples. The most common substratum class observed consisted of pebbles and cobbles covering between 5-30% of the underlying medium to coarse sand substratum (Plate 43). The next most common substratum class observed consisted of areas of medium sand substratum with detritus in places and little bioturbation (Plate 44). Within the rock outcrop substratum class hard substrate covered between 20-100% of the field of view (Plate 45). Throughout the tow, distinct mega-ripples of detritus and gravel clinker were apparent suggesting this area experienced some degree of hydrodynamic activity.

Commonly observed organisms within the sand substratum class were fish, including grenadiers, flatfish and other unidentified species; and asteroids. Within the cobbles and pebbles substratum class, commonly observed organisms were asteroids, globose form sponges and fish including flatfish and other unidentified species. Sessile organisms including cup sponges (possibly *Axinella* sp or *Phakiella* sp), erect bryozoans (*Reteporella* sp and cyclostomes), encrusting sponges and bryozoans were also characteristic of this substratum class. Stylasterid corals were also present. The rock outcrop substratum class differed little from the pebbles and cobbles substratum class in terms of faunal composition with a similar sessile and encrusting fauna as well as asteroids and fish including grenadiers, flatfish and other unidentified species.

COR0511 (144-145 m). Duration 30:00 minutes. Drop frame system
EUNIS habitats: A6.3, A6.11, A6.21
Substratum class codes: BDRK, BCLS, COS, MEGR, RCOC, SAND

No photos were available from this tow. Image quality of this tow was moderately good. However, camera elevation high above the seabed at times made it difficult to observe the epifauna. Six substratum classes were represented within this tow and are given in order of frequency of occurrence: exposed bedrock, megaripples, cobbles on sand, boulder with cobbles on sand, sand. The most common substratum class observed within this station was exposed bedrock where hard substrate covered between 40-100% of the field of view. Within the cobbles substratum class cobbles covered between 5-60% of the underlying medium to coarse sand substratum. Boulders with cobbles covered between 30-100% of the underlying medium to coarse sand substratum within the boulders and cobbles substratum class; and the sand substratum class was composed of medium to coarse sand with detritus, clinker and some bioturbation. Cobbles within this station were well rounded and distinct linear bands in the substrate (mega-ripples) were well formed, suggesting this area experienced a degree of hydrodynamic activity.

Epifauna were abundant within the exposed bedrock, rock outcrop and boulders/cobbles substratum classes. The most commonly observed organisms within the two rock substratum

class were asteroids, cup sponges (possibly *Axinella* sp or *Phakiella* sp) and encrusting sponges. The same fauna were present within the boulder/cobbles substratum class: asteroids, cup sponges (possibly *Axinella* sp or *Phakiella* sp) and encrusting sponges. The cobbles on sand substratum class again supported the same faunal composition as the previous substratum classes although abundance was slightly lower: asteroids, some cup sponges (possibly *Axinella* sp or *Phakiella* sp) and encrusting sponges. Fauna were sparse within the sand substratum class, with only a few asteroids and fish observed.

COR0512 (146 m). Duration 30:00 minutes. Drop frame system
EUNIS habitats: A6.3, A6.11, A6.2
Substratum class codes: BDRK, COS, MEGR, PACOS, POS, RCOC, SAND

Image quality of this tow was moderately good, although erratic camera movements and elevation high above the seabed at times made it difficult to interpret the video data. Seven substratum classes were observed within this tow and are given in order of frequency of occurrence: sand, exposed bedrock, pebbles and cobbles on sand, rock outcrop, pebbles on sand, and cobbles on sand. The most common substratum class observed within this station was medium to coarse sand substratum with detritus, clinker and little bioturbation (Plate 46). Cobbles and pebbles covered between 5-30% of the underlying medium to coarse sand substratum in the cobbles and pebbles on sand substratum class. Exposed bedrock covered between 20-100% of the field of view within the exposed bedrock substratum class (Plate 47). Signs of current scour and the presence of linear bands (mega-ripples) of clinker and pebbles (Plate 48) within this station suggested this area experiences a degree of hydrodynamic activity.

The most commonly observed organisms within the two rock substratum classes were asteroids (*Henricia* sp and *Stichastrella rosea*) and sessile or encrusting forms including cup sponges (possibly *Axinella* sp or *Phakiella* sp), globose and encrusting sponges, and erect bryozoans (*Reteporella* sp and cyclostomes). The pebbles and cobbles on sand, pebbles on sand and cobbles on sand substratum classes and medium sand substratum class supported few epifauna.

COR0513 (151-153 m). Duration 31:00 minutes. Drop frame system
EUNIS habitats: A6.3, A6.11, A6.2
Substratum class codes: COS, POS, MEGR, RCOC, SAND

Image quality of this tow was moderately good, although the elevation of the camera high above the seabed at times made it difficult to interpret the video. Five substratum classes were represented within this tow and are given in order of frequency of occurrence: sand, pebbles on sand, rock outcrop, cobbles on sand, and megaripples. The most common substratum class observed within this tow is medium sand with some lebenspurren including mounds and burrows (Plate 49). Pebbles covering between 5-60% of the underlying medium to coarse sand substratum with distinct linear bands (mega-ripples) of clinker throughout constituted the next most common substratum class (Plate 50). Areas of rock outcrop, covering between 30-60% of the cameras field of view (Plate 51) were the next most frequently observed substratum class, followed by cobbles covering between 5-35% of the underlying medium to coarse sand substratum (Plate 52). The presence of linear bands (mega-ripples) within this tow suggested this area experiences a degree of hydrodynamic activity.

The most commonly observed organisms within the rock outcrop substratum type were asteroids (*Henricia* sp) and sessile or encrusting forms including cup sponges (possibly *Axinella* sp or *Phakiella* sp), globose and encrusting sponges, and erect bryozoans (*Reteporella* sp and cyclostomes). The faunal composition of the cobbles substratum class differed little from that of the rock outcrop substratum class although the squat lobster *Munida* sp was more common. The pebbles on sand substratum class and medium sand substratum class supported few fauna.

COR0514 (154-155 m). Duration 16:00 minutes. Drop frame system
EUNIS habitats: A6.3
Substratum class codes: PACOS

Image quality of this tow was fair due to visibility being frequently obscured by silt clouds raised by contact with the seabed and poor lighting. Also the elevation of the camera high above the seabed at times made it difficult to interpret the video data. One substratum class was represented within this tow: pebbles with cobbles covering between 5-80% of the underlying medium to medium to coarse sand substratum (Plate 53). Cobbles only occurred occasionally with predominately clinker and pebbles throughout. Type 4 ripples were present at the start of the tow and signs of current scour were present throughout suggesting this area experiences a degree of hydrodynamic activity.

Few fauna were observed within this station, and the most commonly observed organisms were asteroids including *Luidia ciliaris* and *Hippasteria phrygiana* and fish, which included grenadiers and flatfish.

COR0515 (219-222 m). Duration 30:00 minutes. Drop frame system
EUNIS habitats: A6.3, A6.14
Substratum class codes: BCLS, COS, PACOS, SAND

Image quality of this tow was moderately good, although the elevation of the camera high above the seabed at times made it difficult to observe epifauna. Four substratum classes were represented within this tow and are given in order of frequency of occurrence: boulders with cobbles on sand, sand, cobbles on sand, and pebbles and cobbles on sand. The most common substratum class observed was composed of boulders with cobbles covering between 5-30% of the underlying medium to coarse sand substratum. Areas of fine to medium sand substratum with shell, coral debris and lebenspurren in the form of mounds and depressions, comprised the next most common substratum class observed (Plate 54). The cobbles on sand substratum class covered less than 50% of the area surveyed and comprised areas of cobbles covering between 5-10% of the underlying medium to fine sand substratum (Plate 55). The pebbles and cobbles on sand substratum class were only briefly encountered. The presence of shell and coral debris suggested that this area may experience a degree of hydrodynamic activity.

Epifauna were not highly abundant within this tow. Commonly observed organisms within the boulders/cobbles and cobbles substratum classes were sessile and encrusting forms including cup sponges (possibly *Axinella* sp or *Phakiella* sp), globose and encrusting sponges, solitary corals (*Caryophyllia* sp) and erect bryozoans (*Reteporella* sp and cyclostomes). The sand substratum class was characterised by asteroids and fish including haddock (*Melanogrammus aeglefinus*) and flatfish.

COR0516 (221-222 m). Duration 31:00 minutes. Drop frame system
EUNIS habitats: A6.3, A6.14
Substratum class codes: BCLS, COS, PACOS, SAND

Image quality of this tow was moderately good, however, the elevation of the camera high above the seabed at times made it difficult to observe epifauna. Four substratum classes were represented within this tow and are given in order of frequency of occurrence: sand, cobbles on sand, boulders with cobbles on sand, and pebbles and cobbles on sand. The most common substratum class observed consisted of fine to coarse sand substratum with lebenspurren including mounds and depressions with some area of coral fragments (Plate 56). The next most common substratum class observed consisted of cobbles covering between 5-25% of the underlying medium sand substratum (Plate 57). The boulders and cobbles on sand substratum class consisted of boulders and cobbles covering between 5-20% of the underlying medium sand substratum (Plate 58). The pebbles and cobbles on sand substratum class were only briefly encountered. Although there was little sign of current scour, the presence of coarse substratum suggested this area may experience a degree of hydrodynamic activity.

Fauna were moderately abundant within this tow. The most commonly observed organisms within the sand substratum class were asteroids including *Stichastrella rosea*, fish including flatfish and other unidentified forms, and cerianthid anemones. The most commonly observed organisms within the cobbles on sand substratum class were asteroids including *Stichastrella rosea*, squat lobsters (*Munida* sp) and erect and globose form sponges. Sessile and encrusting forms including cup sponges (possibly *Axinella* sp or *Phakiella* sp), globose and encrusting sponges, solitary corals (*Caryophyllia* sp) and erect bryozoans (*Reteporella* sp) were also characteristic of this substratum class. The boulders and cobbles substratum class differed little from the cobbles on sand substratum class with asteroids, fish and similar sessile species.

COR0517 (221-227 m). Duration 30:00 minutes. Drop frame system
EUNIS habitats: A6.3, A6.14
Substratum class codes: BCLS, COS, PACOS, SAND

Image quality was generally good within this tow, although there were areas where silt clouds obscured the camera's view of the seabed and the camera's elevation was too high to observe the epifauna. Four substratum classes were represented within this tow and are given in order of frequency of occurrence: sand, boulders and cobbles on sand, cobbles on sand and pebbles and cobbles on sand. The most common substratum class consisted of medium to coarse sand with some bioturbation (mounds) (Plate 59). Boulders with cobbles covering between 5-50% of the underlying medium to coarse sand substratum composed the next most commonly observed substratum class (Plate 60). Within the cobbles on sand substratum class cobbles covered between 5-15% of the underlying medium to coarse sand substratum (Plate 61). The pebbles and cobbles on sand substratum class were only briefly encountered. There were signs of current scour which suggested this area experiences a degree of hydrodynamic activity.

Fauna was not highly abundant; the two most commonly observed groups of organisms, which were observed across all substratum classes within this station, were fish and asteroids. The asteroids had the highest abundance and included: *Porania pulvillus, Hippasteria phrygiana, Henricia sanguinolenta* and other unidentified species. The fish fauna included

flat-fish, bluemouth red fish *Helicolenus dactylopterus* and unidentified forms. Within the boulders/cobbles and cobbles substratum classes the fauna were typical of this region although not highly abundant, with cup sponges (possibly *Axinella* sp or *Phakiella* sp), encrusting sponges, solitary corals (*Caryophyllia* sp) and erect bryozoans (*Reteporella* sp).

COR0518 (263-264 m). Duration 8:00 minutes. Drop frame system
EUNIS habitats: A6.3
Substratum class codes: COS, SAND

No photos were available for this station. Image quality within this tow was fair; however there were problems with silt clouds caused from contact with the seabed, and erratic camera movements at times. Two substratum classes were represented within this tow and are given in order of frequency of occurrence: sand and cobbles on sand. The most common habitat type encountered was composed of sand with gravel, signs of bioturbation and lebenspurren in the form of mounds and animal tracks. The other substratum class observed was composed of areas of cobbles covering 5% of the underlying sandy mud substratum. There were signs of current scour and areas with type 3/4 ripples which suggested this area experiences a degree of hydrodynamic activity.

Very few fauna were observed within this tow and none of the photographs taken were useable.

COR0509 (271 m). Duration 31:00 minutes. Drop frame system
EUNIS habitats: A6.3
Substratum class codes: BCLS, COS, SAND

Image quality of this tow was moderately good. Three substratum classes were observed within this tow and are given in order of frequency of occurrence: sand, cobbles on sand, and boulders and cobbles on sand. The most common substratum class encountered was composed of medium to fine sand substratum with detritus, some coral debris, and lebenspurren in the form of mounds, depressions and tracks (Plate 62). Cobbles covering between 5-10% of the underlying medium sand substratum composed the other significant substratum class within this station (Plate 63). The final and least frequently observed substratum class consisted of boulders with cobbles covering 10-20% of the underlying medium sand substratum.

The medium sand substratum class was characterised by the holothurian *Stichopus tremulus* and hag fish (*Myxine glutinosa*). The cobbles on sand substratum class was also characterised by the holothurian *Stichopus tremulus*, as well as sessile organisms including cup sponges (possibly *Axinella* sp or *Phakiella* sp), erect bryozoans (*Reteporella* sp, and cyclostomes), solitary corals (*Caryophyllia* sp) and encrusting sponges and bryozoans. The faunal composition of the boulder and cobbles substratum class differed little from the cobble substratum class.

COR0519 (272-275 m). Duration 31:00 minutes. Drop frame system
The image quality of this tow was so poor that it was unusable.

COR0508 (272-276 m). Duration 23:00 min. Drop frame system
EUNIS habitats: A6.3, A6.611
Substratum class codes: BCLS, COS, PACOS, SAND, CORRUB

No photos were available for this tow. Image quality of this tow was moderately good. Four substratum classes were represented within this tow and are given in order of frequency of occurrence: sand, cobbles on sand, pebbles and cobbles on sand, boulders and cobbles on sand, and coral rubble. The most commonly observed substratum class consisted of medium to fine sand with detritus, and signs of bioturbation, with lebenspurren in the form of burrows and mounds. The cobbles on sand substratum class were composed of cobbles covering between 2-35% of the underlying medium sand substratum. The coral rubble class was composed of *Lophelia pertusa* rubble, covering between 40-80% of the underlying medium sand substratum.

The medium sand substratum class was characterised by the holothurian *Stichopus tremulus* and hag fish. The cobbles on sand substratum class was characterised by sessile organisms including solitary corals (*Caryophyllia* sp), encrusting sponges and bryozoans, serpulid worm tubes and other unidentified forms. As with the previous station *L. pertusa* reef rubble areas were characterised by the squat lobster *Munida* sp, the holothurian *Stichopus tremulus*, and a yellow encrusting sponge species.

COR0507 (273-280 m). Duration 50:00 minutes. Drop frame system
EUNIS habitats: A6.3, A6.611
Substratum class codes: BCLS, COS, SAND, COR, CORRUB

Image quality of this tow was moderately good; however silt clouds and the elevation of the camera high above the seabed at times made it difficult to observe the epifauna. Five substratum classes were represented within this tow and are given in order of frequency of occurrence: sand, *Lophelia pertusa* reef, coral rubble, cobbles on sand, boulders with cobbles on sand. The most common substratum class within this station was composed of medium to fine sand with detritus and coral fragments (Plate 64). Signs of bioturbation and lebenspurren in the form of mounds, depressions and burrows were visible throughout. Large areas of live *L. pertusa* reef with adjacent characteristic rubble areas accounted for approximately 20% of the tow. Within the cobbles on sand substratum class cobbles covered between 5-30% of the underlying medium sand substratum with some coral debris observed (Plate 65). Boulders and cobbles covered between 5-40% of the underlying medium sand substratum within the boulders and cobbles substratum class. Signs of current scour throughout this station suggested that this area experiences a degree of hydrodynamic activity.

Few fauna were observed in the medium sand substratum class. However hag fish, echinoids (*Echinus acutus*), hermit crabs (*Paguridae*) and the occasional macrourid were noted. Areas of cobbles on sand were more diverse with many sessile forms including the erect bryozoans (*Reteporella* sp and cyclostomes), solitary corals (*Caryophyllia* spp), and cup sponges (possibly *Axinella* sp and *Phakiella* sp). The bluemouth red fish (*Helicolenus dactylopterus*) was also characteristic of this substratum class. The coral rubble areas were characterised by the squat lobster *Munida* sp, the holothurian *Stichopus tremulus* and a yellow encrusting sponge species. A large number of small ophiuroids (possibly *Ophiactis* sp) were often visible living within the dead coral at this station.

COR0502 (289-290 m). Duration 31:00 min. Sledge system
EUNIS habitats: A6.3, A6.611, A6.14
Substratum class codes: BCLS, COS, PACOS, SAND, CORRUB, BOS

The image quality of this tow was good. Six substratum classes were represented in this short tow highlighting the heterogeneity of the sea bed in this region. The presence of iceberg ploughmarks and *Lophelia pertusa* meant the sea bed alternated between the substratum classes sand, cobbles on sand, cobbles and boulders on sand, boulders on sand, *L. pertusa* reef, and coral rubble areas. The sand substratum class was fairly uniform with signs of bioturbation and lebenspurren in the form of pits, mounds, burrows, faecal casts, and tracks visible throughout (Plate 66). There were frequent clear occasions where the camera traversed an iceberg ploughmark and the sand seabed was punctuated by an area of cobbles, boulders, or boulders and cobbles. Within the 'cobbles and boulders on sand' substratum class the cobbles and boulders covered between 5-90% of the medium sand substratum (generally 40%) (Plate 67). Within the boulders on sand substratum class, boulders had between 5-40% coverage (Plate 68). Within the cobbles on sand substratum class, cobbles had 5-25% coverage (Plate 69). There were distinct areas where the seabed was covered (85-100 %) with dense coral rubble (substratum class '*L. pertusa* rubble') possibly resulting from reef destruction rather than natural degradation. Other areas of coral rubble were observed bordering intact reef. Here small fragments of both dead and live *L. pertusa* were present.

The medium sand substratum class was characterised by hag fish, the echinoid *Echinus acutus* and hermit crabs (Paguridae), although a number of fish species including Macrourids were noted. The boulders and cobbles on sand substratum class was characterised by squat lobsters (*Munida* sp), which were frequently found partially concealed beneath the cobbles and boulders, the holothurian *Stichopus tremulus*, and the bluemouth red fish (*Helicolenus dactylopterus*). The cobbles and boulders themselves were encrusted with sponges (encrusting, erect, globose), bryozoans (encrusting forms), solitary corals (*Caryophyllia* sp) and serpulid worm tubes. The areas of destroyed or damaged reef were characterised by the squat lobster *Munida* sp and a yellow encrusting sponge species. A large number of small ophiuroids (possibly *Ophiactis* sp) were often visible living within the dead coral at this station.

COR0503 (300-302 m). Duration 21:00 minutes. Sledge system
EUNIS habitats: A6.3, A6.14
Substratum class codes: BCLS, COS, SAND

The image quality of this tow was good. Three substratum classes were observed at this station, the distribution of which were related to the presence of iceberg ploughmarks in this region. The sand substratum class was most commonly observed and was punctuated by brief areas of the cobbles on sand substratum class, and the boulders and cobbles on sand substratum class. This occurred where the camera crossed an iceberg ploughmark track. The seabed classed as sand was fairly uniform with signs of bioturbation and lebenspurren in the form of pits, mounds, burrows, faecal casts, and tracks visible throughout (Plate 70). Within the cobbles on sand substratum class the cobbles covered between 5-50% of the underlying sand seabed (Plate 71). Boulders and cobbles within the boulders and cobbles substratum class covered between 5-50% of the sandy seabed (Plate 72). There were signs of hydrodynamic activity at this station.

Epifauna were not highly abundant at this station. The medium sand substrate was characterised by hag fish and hermit crabs (*Paguridae*), although burrowing anemones (cerianthids) were also of note. The cobbles on sand substratum class was characterised by encrusting organisms (sponges, bryozoans, serpulid worm tubes and other unidentified forms), as was the boulders and cobbles on sand substratum class.

COR0501 (306-315 m). Duration 20:00 minutes. Sledge system
EUNIS habitats: A6.3, A6.611.
Substratum class codes: SAND, COR, CORRUB, BOS

The image quality of this tow was good. Four substratum classes were observed in this tow, the most common of which was sand (Plate 73). Seabed in this substratum class was fairly uniform but with some areas showing increased faunal activity. Signs of bioturbation and lebenspurren in the form of pits, mounds, burrows and tracks were visible throughout. The boulders on sand substratum class were also observed and were composed of boulders covering 5-10% of the underlying sand substratum. The other two substratum classes present included *Lophelia pertusa* reef and *L. pertusa* rubble. A small area of live intact reef (*ca*. 1m wide, 2m long and 0.6m high) was observed at this station with characteristic areas of coral rubble habitat either side of the main reef. There were, however, significant areas of destroyed or damaged reef with, in one area, a large prominent trawl mark clearly visible.

Epifauna were not highly abundant at this station. The sand substratum class was characterised by hag fish, the echinoid *Echinus acutus*, and hermit crabs (*Paguridae*), although toward the end of the tow there were a significant number of a different echinoid species (*Spatangus raschi*) observed. Where cobbles were present, they were only sparsely populated with epifauna. In the live *L. pertusa* reef, erect sponges and the echinoid *Cidaris cidaris* were visible. In the destroyed and damaged reef areas (*L. pertusa* rubble) the squat lobster *Munida* sp, the holothurian *Stichopus tremulus* and the echinoid *Cidaris cidaris* were frequently visible. In addition a yellow encrusting sponge species often occurred growing on dead coral fragments.

COR0506 (316-319 m). Duration 30:00 min. Drop frame system.
EUNIS habitats: A6.3, A6.611
Substratum class codes: BCLS, COS, SAND, COR, CORRUB

Image quality of this tow was moderately good. However, poor lighting and the elevation of the camera high above the seabed, at times, made it difficult to observe the epifauna. Five substratum classes were represented within this tow and are given in order of frequency of occurrence: sand, cobbles on sand, boulders and cobbles on sand, *Lophelia pertusa* reef and *L. pertusa* rubble. The most commonly observed substratum class consisted of fine to medium sand with detritus. Signs of bioturbation and lebenspurren in the form of depressions, animal tracks, mounds and burrows were visible throughout (Plate 74). The next most commonly observed substratum class consisted of cobbles covering between 5-50% of the underlying medium sand substratum (Plate 75). Within the boulders with cobbles on sand substratum class hard substrate covered 20% of the underlying medium sand substratum. An area of live coral and an area of coral rubble (25-50%) were observed although not adjacent to one another. As coral rubble areas are characteristic of the fringes of a live reef area it is likely that other areas of live *L. pertusa* are present nearby.

Faunal composition was not homogenous throughout this tow, with obvious differences in relative abundance between substratum classes. The most commonly observed organisms within the sand substratum class were echinoids *Spatangus raschi* and fish. *Echinus acutus* and *Stichopus tremulus* were also observed within this substratum class. The boulders and cobbles on sand substratum class was probably the most species rich within this tow, with abundant sessile fauna including the erect bryozoan *Reteporella* sp, serpulid worms, solitary coral polyps (C*aryophyllia* sp) and many morphospecies of sponge including orange globose, yellow tubular and encrusting types. In addition fish (Macrourid) and *Stichopus tremulus* were also observed. The areas of the reef forming coral *L. pertusa* also supported a rich fauna. However, in contrast to the boulders/cobbles substratum class, the cobbles on sand substratum class appeared to have less fauna.

COR0505 (318-320 m). Duration 16:00 minutes. Sledge system
EUNIS habitats: A6.3
Substratum class codes: BCLS, COS, SAND

Image quality of this tow was generally good. However, the elevation of the camera high above the seabed, at times, made it difficult to observe the epifauna. Three substratum classes were observed and are given in order of their frequency of occurrence: sand, cobbles on sand, boulders and cobbles on sand. The most common substratum class consisted of fine to medium sand with coral debris and detritus. Bioturbation and lebenspurren in the form of mounds, animal tracks, burrows, depressions and faecal casts were visible throughout (Plate 76). Within the cobbles on sand substratum class cobbles covered between 10-40% of the underlying medium sand seabed (Plate 77). There were signs of current scour suggesting that this area experiences a degree of hydrodynamic activity.

Fauna were moderately abundant within this station. A greater abundance of epifauna was observed within the sand substratum class. Commonly observed organisms were echinoids including *Echinus acutus* and *Cidaris cidaris*. *Stichopus tremulus* and fish including grenadiers, flatfish and others were also common in this class. In places emergent fauna were clearly visible. Within the cobbles on sand substratum class *Stichopus tremulus* and fish including flatfish, bluemouth red fish *Helicolenus dactylopterus* and grenadiers were the most frequently observed organisms. Sessile and encrusting species were visible on the cobbles and included encrusting sponges and bryozoans, solitary corals, serpulid worm tubes and hydroid turf.

COR0504 (337-342 m). Duration 20:00 minutes. Sledge system
EUNIS habitats: A6.3
Substratum class codes: PACOS, SAND

The image quality of this tow was generally good although in places the camera sledge (and therefore the video recording) lost contact with the sea bed and silt clouds formed where it regained contact. Two substratum classes were observed at this station. The majority of the tow was classed as sand but this substratum class was punctuated by brief areas of the pebbles and cobbles on sand substratum class. The substratum class distribution was most likely related to the presence of iceberg ploughmarks in the region. Within the sand substratum class the seabed was fairly uniform with detritus and signs of bioturbation and lebenspurren in the form of pits, mounds, burrows, faecal casts, and tracks visible throughout (Plate 78). Within the pebbles and cobbles on sand substratum class pebbles and cobbles

covered 10-15% of the underlying sand. There was some evidence of hydrodynamic activity at this station and a small amount of clinker was present throughout.

The medium sand substratum was characterised by hermit crabs *(Paguridae*), the holothurian *Stichopus tremulus* and hag fish. Palaemonid shrimps and the echinoid *Spatangus raschi* were also of note. The pebbles and cobbles on sand class was characterised by encrusting organisms (sponges, bryozoans, serpulid worm tubes and other unidentified forms).

DW05909 (407-414 m). Duration 21:00 minutes. Sledge system
EUNIS habitats: A6.4. A6.3
Substratum class codes: COS, PACOS, SAND

Image quality of this tow was generally good although the camera sled lost contact with the seabed occasionally. Three substratum classes were observed within this station and are given in order of frequency of occurrence: sand (Plate 79), cobbles on sand, pebbles and cobbles on sand. The most common substratum class consisted of muddy sand with detritus, shell debris and some clinker. There were signs of bioturbation and lebenspurren, including *Nephrops* burrows (not abundant) and echinoid tracks. Within the tow small areas were classed as cobbles on sand or pebbles and cobbles on sand, and here the hard substrata covered less than 10% of the underlying muddy sand substrate. The presence of type 3 ripples throughout the tow suggested this area experiences a degree of hydrodynamic activity.

Fauna were abundant at this station, and the most commonly observed organisms were the echinoid *Echinus acutus*, and fish including blue mouth red fish, flatfish, grenadiers, *Chimaera monstrosa* and others. Other commonly observed organisms were the holothurian *Stichopus tremulus* and hermit crabs (*Paguridae*). Emergent fauna were visible throughout with small cerianthid anemones and polychaete tube worms also observed.

DW05908 (437-445 m). Duration 20:00 minutes. Sledge system
EUNIS habitats: A6.4
Substratum class codes: SAND

No photos were available for this tow. Image quality was generally good although the speed and elevation of the camera made interpretation difficult in places. One substratum class was represented within this station: sand. This substratum class consisted of muddy sand substrate with detritus, shell debris and bioturbation. *Nephrops* burrows, smaller burrows, pits and depressions were visible throughout. There were signs of current scour in places and shell debris was present throughout, suggesting the area experiences a degree of hydrodynamic activity.

The most commonly observed organisms within this station were the echinoid *Echinus acutus,* cerianthid anemones, the holothurian *Stichopus tremulus*, the echinoid *Spatangus raschi* and fish including one *Chimaera monstrosa*.

DW05903 (444-477 m). Duration 30:00 minutes. Sledge system
EUNIS habitats: A6.4
Substratum class codes: SAND

Image quality was generally good within this tow although the elevation of the camera meant that in places the seabed could not be observed. One substratum class was observed at this

station: sand. This substratum class was composed of fine-medium sand substrate with detritus and signs of bioturbation (Plate 80). *Nephrops* burrows (old and active) and animal tracks were visible throughout. There were signs of current scour suggesting this area experiences a degree of hydrodynamic activity.

The most commonly observed organisms were the echinoderms with one dominant species (*Echinus acutus*). Fish were the next most commonly observed organisms, including the bluemouth red fish *Helicolenus dactylopterus, Chimaera monstrosa*, grenadier, monk fish *Lophius piscatorius*, flatfish (probably *Megrim*), and others. The remaining observed organisms were present in almost equal abundance and included burrowing anemones (Cerianthids), echinoids (*Spatangus raschi* and *Cidaris cidaris*) and *Stichopus tremulus*. Emergent fauna were visible throughout with small ceranthid anemones and polychaete tube worms also observed.

DW05904 (448-481 m). Duration 30:00 minutes. Sledge system
EUNIS habitats: A6.4
Substratum class codes: SAND

Image quality was generally good within this tow. One substratum class was observed at this station: sand. This class consisted of medium to fine sand substrate with detritus (Plate 81). Small coral fragments (*Lophelia pertusa*) and signs of bioturbation were visible, with mounds, depressions, animal tracks and *Nephrops* burrows (abundant) observed throughout. There were signs of current scour and shell debris suggesting this area experiences a degree of hydrodynamic activity.

The most commonly-observed organisms within this tow were burrowing anemones (cerianthids) and the holothurian *Stichopus tremulus*. Fish were abundant and included the blue mouth red fish *Helicolenus dactylopterus*, flatfish, grenadiers and others. Echinoids were not as abundant as observed at other stations but included *Echinus acutus* and *Spatangus raschi*. Emergent fauna were visible throughout with small ceranthid anemones and polychaete tube worms observed.

DW05907 (461-481 m). Duration 25:00 minutes. Sledge system
EUNIS habitats: A6.4
Substratum class codes: SAND

No photos were available for this tow. Image quality was generally good within this tow. One substratum class was observed at this station: sand. This substratum class consisted of medium sand substrate with detritus, shell debris and little bioturbation. There were signs of current scour and shell debris throughout, suggesting this area may experience a degree of hydrodynamic activity.

The most commonly observed fauna at this station were the echinoid *Echinus acutus*, the holothurian *Stichopus tremulus* and fish including *Chimaera monstrosa*, flatfish, grenadiers and others. Other, less abundant organisms observed were burrowing anemones (cerianthids) and the echinoid *Spatangus raschi*.

DW05905 (469-488 m).Duration 20:00 minutes. Sledge system
EUNIS habitats: A6.4
Substratum class codes: SAND

Image quality was generally good within this tow. One substratum class was observed at this station: sand. This class consisted of fine to medium sand substrate with detritus (Plate 82). Shell debris, signs of bioturbation and lebenspurren were visible throughout with animal tracks and *Nephrops* burrows (abundant). There were signs of current scour and shell debris throughout suggesting this area may experience some hydrodynamic activity.

Epifauna were moderately abundant at this station. The most commonly observed organisms included the echinoid *Echinus acutus* and burrowing anemones (cerianthids). Fish were the next most common organisms observed and included grenadiers, *Chimaera monstrosa*, bluemouth red fish *Helicolenus dactylopterus* and others. *Stichopus tremulus* and *Spatangus raschi* were also observed within this tow. Emergent fauna were visible throughout with small cerianthid anemones and polychaete tube worms identified.

DW05906 (492-507 m).Duration 17:00 minutes. Sledge system
EUNIS habitats: A6.4
Substratum class codes: SAND

No photos were available for this tow. Image quality was generally good within this tow although at times the camera moved very quickly making it difficult to identify organisms. One substratum class was observed at this station: sand. This class was composed of muddy sand substrate with some evidence of bioturbation. Echinoid tracks, detritus and shell debris were visible throughout. There were signs of current scour throughout the tow suggesting this area experiences some hydrodynamic activity.

Epifauna were highly abundant at this station. The most commonly observed organisms were the echinoids *Echinus acutus* and *Spatangus raschi*. The next most commonly observed organisms were hermit crabs (Paguridae) and fish including *Chimaera monstrosa*, bluemouth red fish *Helicolenus dactylopterus*, grenadiers.

DW05901 (475-508 m). Duration 30:00 minutes. Sledge system
EUNIS habitats: A6.4
Substratum class codes: SAND

Image quality was generally good, although silt clouds occurred throughout they did not obscure the view significantly. One substratum class was observed at this station: sand. This class was composed of fine-medium sand with signs of bioturbation (Plate 83). Echinoid tracks and *Nephrops* burrows occurred throughout. There was some evidence of hydrodynamic activity throughout the tow with shell debris and signs of current scour.

Fauna were highly abundant within this tow; the most commonly observed fauna were two species of echinoids: *Echinus acutus* and *Spatangus raschi*. In addition, decapods including *Paramola cuvier* and *Bathynectes maravigna*, fish, and the holothurian *Stichopus tremulus* also occurred. Emergent fauna were visible throughout with small ceranthid anemones and polychaete tube worms identified. A lost fishing net was also observed during this tow.

DW05902 (526-548 m). Duration 26:00 minutes. Sledge system
EUNIS habitats: A6.4
Substratum class codes: SAND

No photos were available for this tow. Image quality was generally good. One substratum class was observed at this station: sand. This class consisted of muddy sand with detritus. Some shell debris was visible throughout and there were signs of bioturbation (not abundant), with old *Nephrops* burrows and echinoid tracks also visible in places. There were signs of current scour and type 2 and 3 ripples throughout suggesting this area experiences some hydrodynamic activity.

Fauna were fairly abundant within this tow. The most commonly observed organisms were the echinoids *Echinus acutus* and *Spatangus raschi*. Fish including *Chimaera monstrosa*, grenadier, blue mouth red fish *Helicolenus dactylopterus*, flatfish and others were also observed.

3.2.3 Rockall Bank FRS/JNCC stations 2006

Rockall_1 (245-243m). Duration 31:00 minutes. Drop frame system
EUNIS habitats: A6.2, A6.21, A6.3
Substratum class codes: COS, PACOS, SAND

No photos were available for this tow. Image quality of this tow was generally good, although silt clouds, caused from contact of the camera frame with the seabed, occasionally obscured the camera's view of the seabed. Three substratum classes were represented within this tow and are given in order of their frequency of occurrence: sand, pebbles and cobbles on sand, and cobbles on sand. The most common substratum class consisted of medium muddy sand with silt/gravel deposits, biogenic material and detritus in places. Bioturbation, in the form of mounds was evident throughout. Within the pebbles and cobbles on sand substratum class pebbles and cobbles covered between 20-90% of the underlying sand substrate. These two substratum classes were consecutively distributed throughout the tow. A briefly observed area of seabed could be classed as cobbles on sand. Here the cobbles covered between 5-10% of the underlying sand substrate with some biogenic material also present. There were no obvious signs of hydrodynamic activity within this tow.

Epifauna were sparse within the sand substratum class. The majority of fauna were mobile species: asteroids including *Astropecten irregularis* and possibly *Henricia* sp; ctenophores; fish including *Helicolenus dactylopterus* and flatfish; the holothurian *Stichopus tremulus* and the pencil urchin *Cidaris cidaris*. The only sessile fauna observed was a single sea pen. Fauna were more frequently observed within the pebble and cobbles substratum class, with fauna associated with the cobbles. Conspicuous mobile fauna included: the holothurian *Stichopus tremulus*, asteroids including *Astropecten irregularis, Cidaris cidaris*, squat lobsters and fish including *Helicolenus dactylopterus*. The sessile fauna was characterised by erect sponges and bryozoans (*Reteporella* sp and cyclostomes), and encrusting sponges. Fauna was sparse in the cobbles on sand substratum class with only a few erect sponges observed.

Rockall_3 (225-218m). Duration 21:00 minutes. Drop frame system
EUNIS habitats: A6.21, A6.3
Substratum class codes: PACOS, SAND

Image quality of the tow was poor in places due to both high camera elevation and silt clouds obscuring the camera's view of the seabed. Thus observation of epifauna was difficult. Two substratum classes were represented within this tow and are given in order of their frequency of occurrence: pebbles with cobbles on sand, and sand. Throughout the tow there were silt/gravel deposits and some biogenic material. The most commonly observed substratum class consisted of mixed pebbles with cobbles covering between 10 and 50 % of the underlying muddy sand substrate (Plate 84). The sand substratum class consisted of medium muddy sand with silt. These two substratum classes were consecutively distributed throughout the tow. The presence of type 3 sand ripples within the tow suggests this area is subject to hydrodynamic activity.

Epifauna were sparse within the sand substratum class, with the pencil urchin *Cidaris cidaris*, a single squat lobster, and what appeared to be solitary cup coral observed. Fauna were more frequently observed within the pebbles with cobbles on sand substratum class, due partly to the abundance of fauna associated with the hard substrate. Conspicuous epifauna included: asteroids, erect sponges, anemones (possibly cerianthids), *Stichopus tremulus*, and squat lobsters. Other fauna, which were less noticeable and abundant, were cup corals (probably *Caryophyllia* sp and *Desmophyllum* sp), encrusting sponges, bryozoans (*Reteporella* sp) and flatfish.

Rockall_4 (240-234m). Duration 32:00 minutes. Drop frame system.
EUNIS habitats: A6.2, A6.21, A6.3
Substratum class codes: BCLS, PACOS, SAND

Image quality if the tow was fair, although at times, silt clouds obscured the camera's view of the seabed and high camera elevation made fauna difficult to see and identify. Three substratum classes were observed within this tow and are given in order of their frequency of occurrence: sand, pebbles and cobbles on sand, and boulders and cobbles on sand. The most commonly observed substratum class was composed of medium muddy sand with some biogenic material, silt and clinker deposits. Bioturbation was evident, with an abundance of mounds and a few asteroid tracks throughout. The other two substratum classes were equally represented within this tow: firstly the pebbles and cobbles covering between 5 and 50% of the underlying muddy sand substrate; and mixed boulders, cobbles and pebbles (Plate 85) covering between 30 and 80% of the underlying muddy sand substrate. The habitats were distributed in such a way as to suggest they were part of iceberg plough-mark features; however no acoustic data was available to confirm this. There was evidence of some hydrodynamic activity (type 3 ripples) within the sand substratum class.

Epifauna were not particularly abundance throughout this tow, although there were clear differences in faunal abundance between substratum classes. Fauna which were observed from the sand substratum class included: asteroids, decapods, fish including flatfish and unidentified species, and a single sea pen. Typical fauna found in the pebbles and cobble substratum class were fish, the holothurian *Stichopus tremulus*, encrusting fauna, erect sponges, bryozoans (*Reteporella* sp) and cup corals. Fauna were more abundant in the boulder and cobble substratum class, with conspicuous fauna including the holothurian *Stichopus tremulus*, asteroids, including *Porania* sp, the pencil urchin *Cidaris cidaris*, and

fish, with predominantly *Helicolenus dactylopterus* present. Less conspicuous fauna (thus more difficult to count) were squat lobsters, cup corals, bryozoans (*Reteporella* sp) erect, globose and encrusting sponges.

Rockall_5 (205-197m). Duration 27:00 minutes. Drop frame system.
EUNIS habitats: A6.2, A6.21, A6.3, A6.611
Substratum class codes: CORRUB, POS, PACOS, SAND

No photographs were available from this tow. Image quality of this tow was generally good, with few silt clouds obscuring the camera's view of the seabed. Four substratum classes were represented within this station and are given in order of their frequency of occurrence: sand; pebbles and cobbles on sand; pebbles on sand, and coral rubble. The most common habitat encountered consisted of medium-coarse muddy sand substrate with detritus, silt, clinker and organic debris cover throughout. There was little sign of bioturbation within this substratum class. The next most common substratum class consisted of mixed pebbles and cobbles covering between 10 and 60% of the underlying muddy sand substrate. The other substratum classes were equally represented within the station. Pebbles covered 30% of the underlying muddy sand substrate, and coral rubble (*Lophelia pertusa*) covered between 10 and 45% of the underlying substrate. There was some evidence of hydrodynamic activity within this tow, with type 3 ripples observed from the sand substratum class.

Epifauna was not particularly abundant at this station, although differing between substratum classes. This was most obvious within the sand substratum class, as few epifauna were visible other than the conspicuous holothurian *Stichopus tremulus*, asteroids, ophiuroids and a single fish. Fauna appeared more abundant in the pebble and cobble substratum class, although still not highly abundant. There were a greater number of mobile organisms in addition to fauna associated with the hard substrate. These included *Stichopus tremulus*, squat lobsters, fish including *Helicolenus dactylopterus*; asteroids, encrusting sponges and bryozoans (*Reteporella* sp). Fauna were sparse within the pebbles on sand substratum class, with only one flat fish observed. Within the coral rubble substratum class, only the holothurian *Stichopus tremulus* and yellow globose sponges were observed.

Rockall_10 (192-191m). Duration 31:00 minutes. Drop frame system.
EUNIS habitats: A6.2, A6.21, A6.3
Substratum class codes: POS, PACOS, SAND

Image quality was generally good throughout this tow, with few silt clouds, although at times the elevation and speed of the camera made identification of epifauna difficult. Within this station, three substratum classes were observed and are given in order of their frequency of occurrence: sand, cobbles and pebbles on sand, and pebbles on sand. The most commonly observed substratum class consisted of sand with signs of bioturbation in the form of mounds, pits, sea star tracks, and organic debris (bivalve shells). The next most commonly observed substratum class (although only accounting for approximately 15% of the tow) was composed of mixed pebbles and cobbles covering between 20-35% of the underlying sand substrate (Plate 86). The final substratum class represented <5% of the tow, and was composed of pebbles covering 20% of the underlying sand substrate. Signs of hydrodynamic activity were obvious, with the presence of type 3 ripples throughout the sand substratum class.

The density of epifauna at this station was generally low, although appeared higher within the sand substratum class. Conspicuous fauna included: fish including haddock and flat fish; the

holothurian *Stichopus tremulus*, and squat lobsters. In addition, less conspicuous fauna were observed, including asteroids (*Luidia* sp), small anemones and a single small sea pen. Conspicuous fauna observed from the pebble and cobbles substratum class included squat lobsters, *Stichopus tremulus*, asteroids (*Luidia* sp), fish including the blue mouth redfish (*Helicolenus dactylopterus*), cup and encrusting sponges and ascidians. In contrast, very little epifauna was observed in the briefly encountered pebbles on sand substratum class other than a single holothurian (*Stichopus tremulus*).

Rockall_11 (178-180m). Duration 30:00 minutes. Drop frame system.
EUNIS habitats: A6.2, A6.3
Substratum class codes: COS, POS, SAND

Image quality of this tow was generally good. Three substratum classes were observed at this station and are given in order of their frequency of occurrence: sand, pebbles on sand, and cobbles on sand. The sand substratum class covered the majority of the seabed traversed. Throughout, bioturbation, in the form of mounds and asteroid tracks, were apparent. In addition organic debris (shell) and signs of hydrodynamic activity (type 3 ripples) were visible. Within the pebbles on sand substratum class pebbles covered between 20 and 50% of the underlying sand substrate with organic debris (shell) observed (Plate 87). The cobbles on sand substratum class only covered 10% of the tow. Cobbles covered <5% of the underlying sand substrate within this substratum class.

Epifauna was not highly abundant, although more dense within the sand substratum class. Conspicuous fauna within this class included: the holothurian *Stichopus tremulus*, ctenophores, asteroids, and fish including flat fish. Fauna were sparse in the cobbles on sand substratum class, with only *Stichopus tremulus*, asteroids, and a single fish (*Lepidon eques*) observed. Faunal abundance increased within the pebbles on sand substratum class, with the presence of squat lobsters, asteroids, ophiuroids, and grenadiers.

Rockall_12 (188-190m). Duration 27:00 minutes. Drop frame system.
EUNIS habitats: A6.3
Substratum class codes: SAND

Image quality of this tow was generally good. One continuous substratum class was observed at this station: sand. The class was composed of medium muddy sand with coarse gravel (shell and *Lophelia pertusa*) cover (Plate 88). Bioturbation, in the form of mounds and asteroid tracks was visible; as were signs of hydrodynamic activity (type 3 ripples).

Epifauna were abundant, particularly ctenophores, fish (including flat fish), asteroids and anemones (at least three different species of anemone). Other conspicuous, although less abundant fauna were: *Stichopus tremulus*, echinoids, decapods, hermit crabs, a sea pen and ophiuroids.

Rockall_13 (191-195m). Duration 31:00 minutes. Drop frame system
EUNIS habitats: A6.2, A6.21, A6.3
Substratum class codes: PACOS, POS, SAND

No photos were available for this tow. Image quality of this tow was generally good. Three substratum classes were represented within this tow and are given in order of their frequency of occurrence: sand, cobbles and pebbles on sand, and pebbles on sand. The most commonly

observed substratum class consisted of medium muddy sand, with signs of bioturbation in the form of pits and mounds, and biogenic material (whole shells and pieces). The next most commonly observed substratum class consisted of mixed cobbles and pebbles covering between 20 and 40% of the underlying sand substrate. Ripples (banded pebbles and sand) were visible within this substratum class, suggesting this area is subjected to strong currents. The pebbles on sand substratum class consisted of pebbles covering between 4 and 60% of the underling sand substrate.

Epifauna were abundant throughout the station. Within the sand substratum class ctenophores, *Stichopus tremulus*, hermit crabs, decapods, squat lobsters, and anemones were observed. Other conspicuous fauna included asteroids and fish. Within the mixed pebbles and cobbles substratum class fauna included *Stichopus tremulus*, asteroids, squat lobsters, anemones, fish, and some globose sponges. In the pebbles on sand substratum class, fauna observed were squat lobsters, globose sponges, asteroids, anemones, and flat fish.

Rockall_22 (315-360m). Duration 31:00 minutes. Drop frame system.
EUNIS habitats: A6.2, A6.21, A6.3
Substratum class codes: BCLS, BOS, POS, PACOS, SAND

No photos were available from this tow. Image quality of this tow was generally good. Five substratum classes were represented within this tow and are given in order of their frequency of occurrence: boulders and cobbles on sand, sand, pebbles on sand, boulders on sand, and cobbles and pebbles on sand. The most commonly observed substratum class was composed of mixed boulders and cobbles covering between 20-50% of the underlying sand substrate. The next most commonly observed substratum class was composed of medium sand with some biogenic material. The pebbles on sand substratum class were composed of pebbles covering between 5-30% of the underlying sand substrate, with shell debris present. The remaining substratum classes were only briefly encountered within the tow. The pebbles and cobbles on sand substratum class were composed of mixed pebbles and cobbles covering between 20-35% of the underlying sand substrate. There was little evidence of bioturbation and hydrodynamic activity throughout this station.

There was a distinct difference in the density of fauna observed within each substratum class. Within the boulders and cobbles substratum class, fauna were abundant. Conspicuous fauna included: ctenophores, *Cidaris cidaris*, spider crabs, erect sponges, fish with abundant *Helicolenus dactylopterus*, asteroids, and *Stichopus tremulus*. Within the sand substratum class observed fauna included: ctenophores, *Cidaris cidaris*, hermit crabs, asteroids, and fish. Within the briefly encountered boulders on sand substratum class only one pencil urchin (*Cidaris cidaris*) and a fish (*Helicolenus dactylopterus*) were observed. Conspicuous fauna from the pebbles on sand substratum class included *Cidaris cidaris*, fish, including *Molva* sp and a flat fish. Other fauna observed included hermit crabs and an asteroid. Within the final habitat (pebbles and cobbles), again only briefly encountered, the only fauna observed were *Cidaris cidaris* and *Helicolenus dactylopterus*.

3.2.4 Mapping video tows onto sidescan

Defined substratum classes were used to map each video track in GIS (Appendix 1, 7.4).

3.3 Image analysis

A description of each image analysed is given in Appendix 1, 7.3.

The characterising species of each pre-defined substratum class, determined through SIMPER analysis (Primer 5, Clark and Warwick, 2002) of megafunal count data from image analysis, are given in Table 3.1. The results of the ANOSIM analysis on the faunal composition of each pre-defined substratum class are also given in Table 3.1. For both data sets (FRS/JNCC and SEA7) there are significant differences in the faunal composition between some pre-defined substratum classes at the $p<0.01$ level while others were not faunally distinct (Table 3.2).

Table 3.2: Defined habitat types and characterising species

Habitat	EUNIS equivalent	Characterising species (SIMPER, SEA7)	Characterising species (SIMPER, JNCC/FRS)	Plate	Code	Significant difference in faunal composition (ANOSIM) Φ SEA7, ‡ FRS/JNCC, (- denotes not significant, blank spaces were not tested)													
						MUD	SAND	BIOG	POS	PACOS	COS	BCLS	BOS	BDRK	RCOC	COR	CORRUB	LSBD	
Mud	A6.5 Deep-sea mud	Infaunal tubes	No data	a	MUD														
Sand	A6.3 Deep-sea sand	*Pheronema carpentri*, *Bolocera tuediae*	*Echinus acutus*, Paguridae,	b	SAND	-			-		‡	‡			‡	‡	‡		
Biogenic gravel	A6.22 Deep-sea biogenic gravels	*Ophiactis balli*	No data	c	BIOG	-	-												
Pebbles on sandy substrata	A6.2 Deep-sea mixed substrata	% cover encrusting species, *Cidaris sp*	No data	d	POS	Φ	Φ	-			-	-			-	-	‡		
Pebbles and cobbles on sandy substrata	A6.21 Deep-sea lag deposits	% cover encrusting species, Serpulid worms, *Ophiactis balli*	No data	e	PACOS	Φ	Φ	Φ	Φ										
Cobbles on sandy substrata	A6.2 Deep-sea mixed substrata	% cover encrusting species, Serpulid worms, *Munida sp*	% cover encrusting species, *Reteporella* sp	f	COS	Φ	Φ	Φ	-	-		-			-	‡	‡		

Boulders and cobbles on sandy substrata	A6.2 Deep-sea mixed substrata/ A6.4 Boulders on the deep-sea bed	% cover encrusting species, % cover encrusting bryozoans, Serpulid worms	% cover encrusting species, *Reteporella* spp, *Munida* spp	g	BCLS	Φ	Φ	Φ	Φ	Φ	-				‡	‡	‡	
Boulders on sandy substrata	A6.4 Boulders on the deep-sea bed	No data	No data	h	BOS	-	-	-	-	-	-	-						
Exposed bedrock	A6.11 Deep-sea bedrock	% cover encrusting species, *Reteporella* spp, Cyclostome bryozoans	No data	i	BDRK	Φ	-	-	-	-	-	-	-					
Rock outcrop	A6.11 Deep-sea bedrock	% cover encrusting species, *Ophiactis balli*.	% cover encrusting species, cup sponges (*Axinella* spp & *Phakellia* spp), *Stichastrella rosea*	j	RCOC	Φ	Φ	Φ	Φ	Φ	Φ	-	-	-		‡	‡	
Lophelia pertusa reef	A6.611 Lophelia pertusa reefs	No data	Live % *Lophelia pertusa*, % dead *Lophelia pertusa*, *Munida* sp	k	COR												-	
Lophelia pertusa rubble	A6.611 Lophelia pertusa reefs	*Ophiactis balli*	% Dead *Lophelia pertusa*, *Ophiactis balli*	l	CORRUB	-	-	-	-	-	-	-	-	-	-			
Lag-gravel and sand banding	A6.21 Deep-sea lag deposits	No data	No data	m	LSBD													

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The characterising species of each reef subtype, determined through SIMPER analysis (Primer 5, Clark and Warwick, 2002) of megafunal count data from image analysis, are given in Table 3.3. The results of the ANOSIM analysis of the faunal composition of each reef subtype from different regions of the bank are given in Table 3.4.

Table 3.3: Annex 1 'reef' habitats and characterising species.

Habitat	Code	Annex I reef type	Characterising species (SIMPER, SEA7)	Characterising species (SIMPER, JNCC/FRS)
Cobbles on sandy substrata	COS	Stony reef	Encrusting sponges and bryozoans, serpulids, *Munida* spp, *Ophiactis balli*	Unidentified encrusting species, *Reteporella* spp, *Munida* sp.
Boulders and cobbles on sandy substrata	BCLS			
Exposed bedrock	BDRK	Rocky reef	Encrusting sponges and bryozoans, *Reteporella* spp, solitary coral/ anemonaes, cyclostome bryozoans	Cup sponges, *Reteporella* spp, erect sponges, encrusting sponges, *Stichastrella rosea*, unidentified encrusting species.
Rock outcrop	RCOC			
Lophelia pertusa reef	COR	Biogenic reef	No data	Live % *Lophelia pertusa*, % dead *Lophelia pertusa*, *Munida* sp
Lophelia pertusa rubble	CORRUB	Indicative of biogenic reef	*Ophiactis balli*	% Dead *Lophelia pertusa*, *Ophiactis balli*

Table 3.4: Analysis of similarities (ANOSIM) of faunal composition of reef habitat between different regions of Rockall Bank sampled, a) stony reef; b) biogenic reef; c) rocky reef.

a) Stony reef	**Significant difference in faunal composition (ANOSIM) Φ SEA7, ‡ FRS/JNCC, (- denotes not significant, blank spaces were not tested)**					
region	NW	W	C	E	EF	SW
NW	-	-	-	-		
W		-	-	-		
C			-	-		
E				-		
EF			Φ			
SW						

b) Biogenic reef	**Significant difference in faunal composition (ANOSIM) Φ SEA7, ‡ FRS/JNCC, (- denotes not significant, blank spaces were not tested)**					
region	NW	W	C	E	EF	SW
NW	-	-				
W		-				
C						
E						
EF						
SW						

c) Rocky reef	**Significant difference in faunal composition (ANOSIM) Φ SEA7, ‡ FRS/JNCC, (- denotes not significant, blank spaces were not tested)**					
region	NW	W	C	E	EF	SW
NW						
W						
C						
E						
EF			Φ			
SW						

.

4 Discussion

4.1 Habitat distribution on Rockall Bank

The western and north-western summit regions (271-342m) sampled on Rockall Bank were similar in terms of habitats and species (Figure 4.1). These areas consisted of fine sand seabed scarred by distinct iceberg plough marks composed of parallel lines of cobble and occasionally boulder drop stones with an in-filled furrow between (Sand, COS, BCLS) (Figures 4.2 and 4.3). Within this region clump formations of *Lophelia pertusa* reef were present with characteristic rubble fringe areas (Freiwald *et al*, 2004) (COR, CORRUB) (Figure 4.4). Analysis of the high resolution sidescan sonar suggests these coral clumps are associated with iceberg plough-mark features. Evidence of bottom trawling was apparent in the north western region with distinct furrows produced by trawl doors visible in the sand associated with large areas of coral rubble (Figure 4.5).

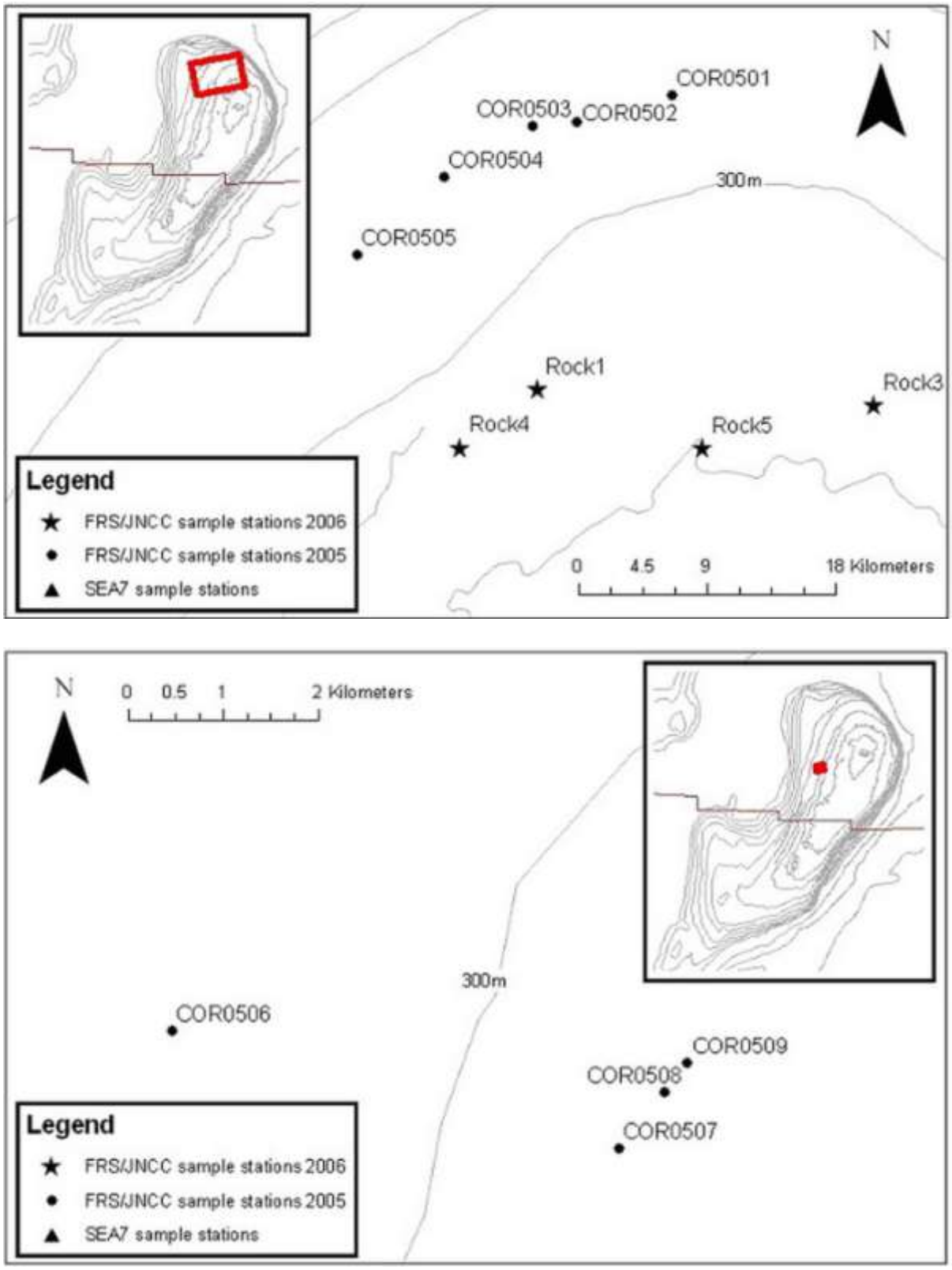


Figure 4.1: The north-western (top) and western (bottom) summit stations sampled on Rockall Bank. Bathymetry © GEBCO Digital Atlas, British Oceanographic Data Centre on behalf of IOC and IHO 1994 & 1997. The exact limits of the UK Continental Shelf are set out in orders made under section 1(7) of the Continental Shelf Act 1964 (© Crown Copyright).

Figure 4.2: Sand in-filled burrow of an iceberg ploughmark. © JNCC/FRS/UoP.

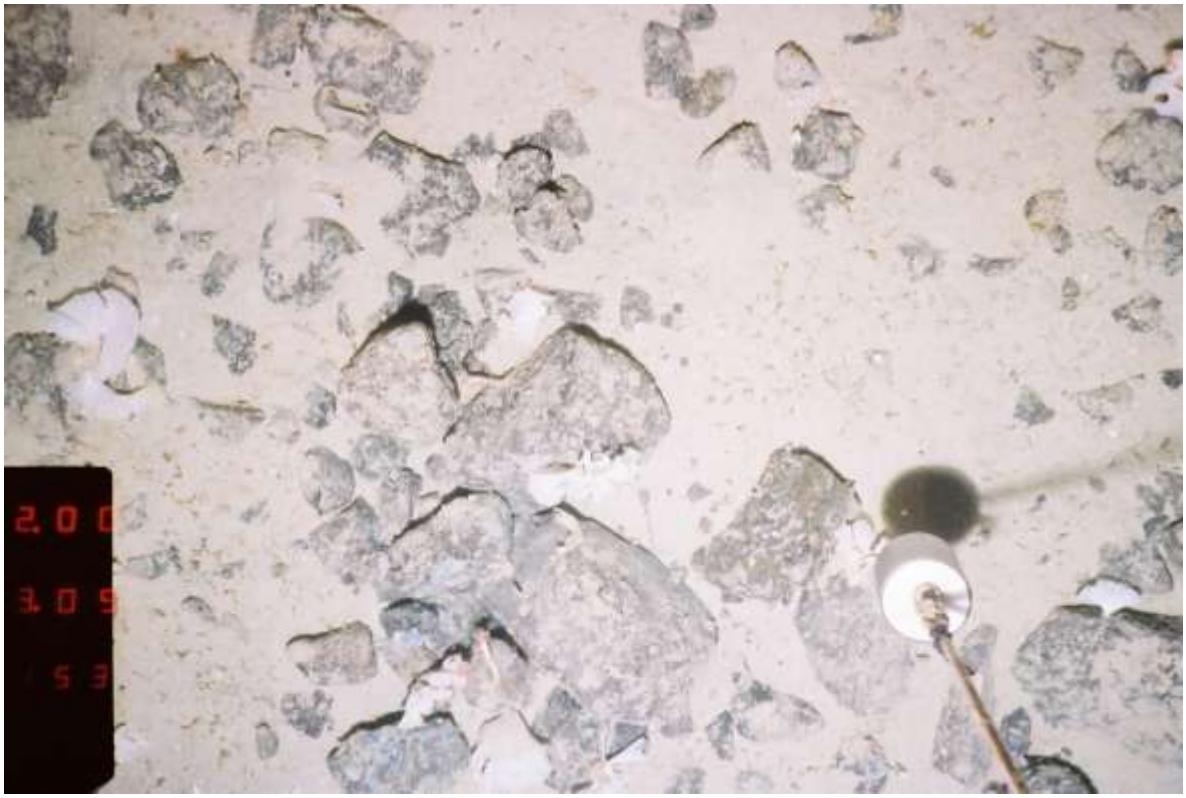


Figure 4.3: Cobble 'boarder' of an iceberg ploughmark. © JNCC/FRS/UoP.

Figure 4.4: Rubble fringes associated with Lophelia pertusa reef structures. © JNCC/FRS/UoP.

Figure 4.5: Trawl mark produced by the passage of heavy metal trawl doors over the substratum. © JNCC/FRS/UoP.

The central summit area sampled on Rockall Bank (141-190m) is different in character to both eastern and western regions sampled with large areas of exposed bedrock and rock outcrop fringed by areas of boulders, cobbles, pebbles and sand (BDRK, RCOC, BCLS, COS, PACOS, POS, SAND) (Figures 4.6 and 4.7). There are signs of increased current activity with distinct megaripples visible at many of the stations sampled (MEGR) (Figure 4.8). The sand is coarse with areas of biogenic gravel and pebbles (BIOG).

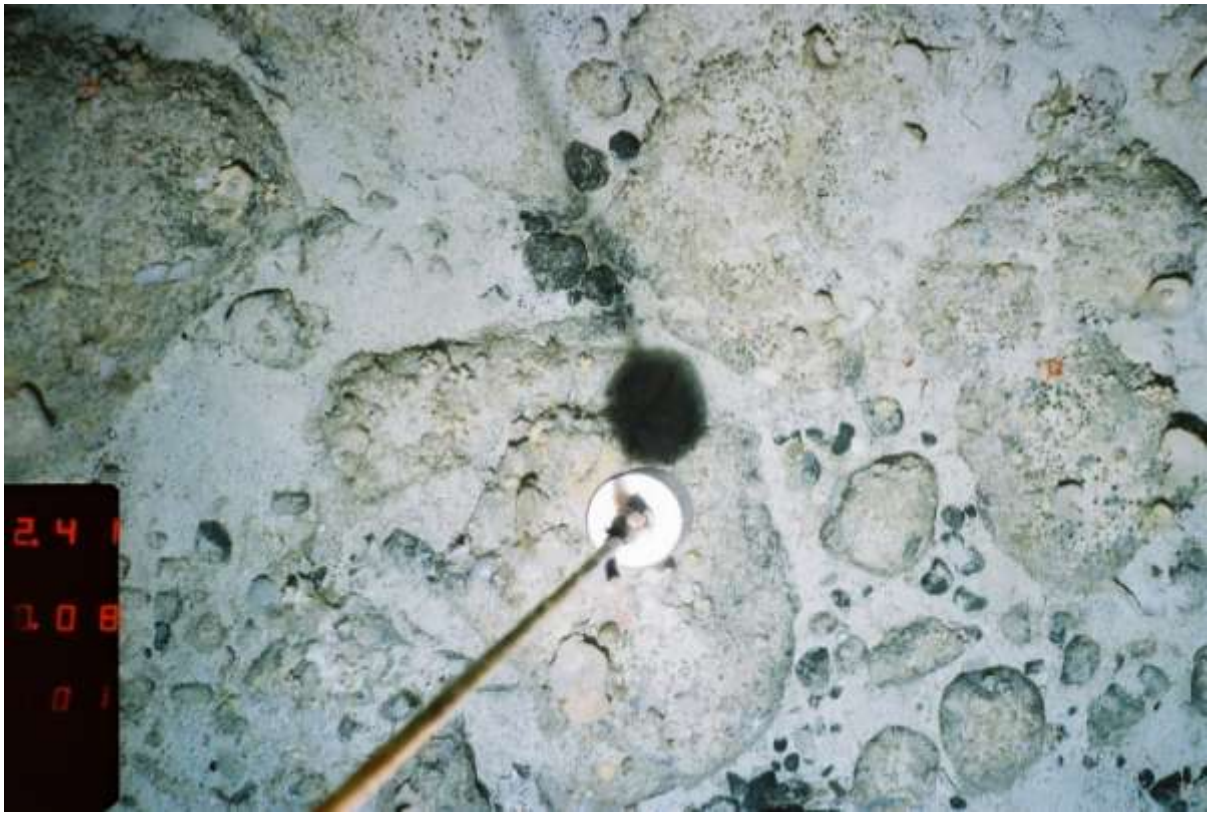


Figure 4.6: Areas of exposed bedrock on central Rockall Bank. © JNCC/FRS/UoP.

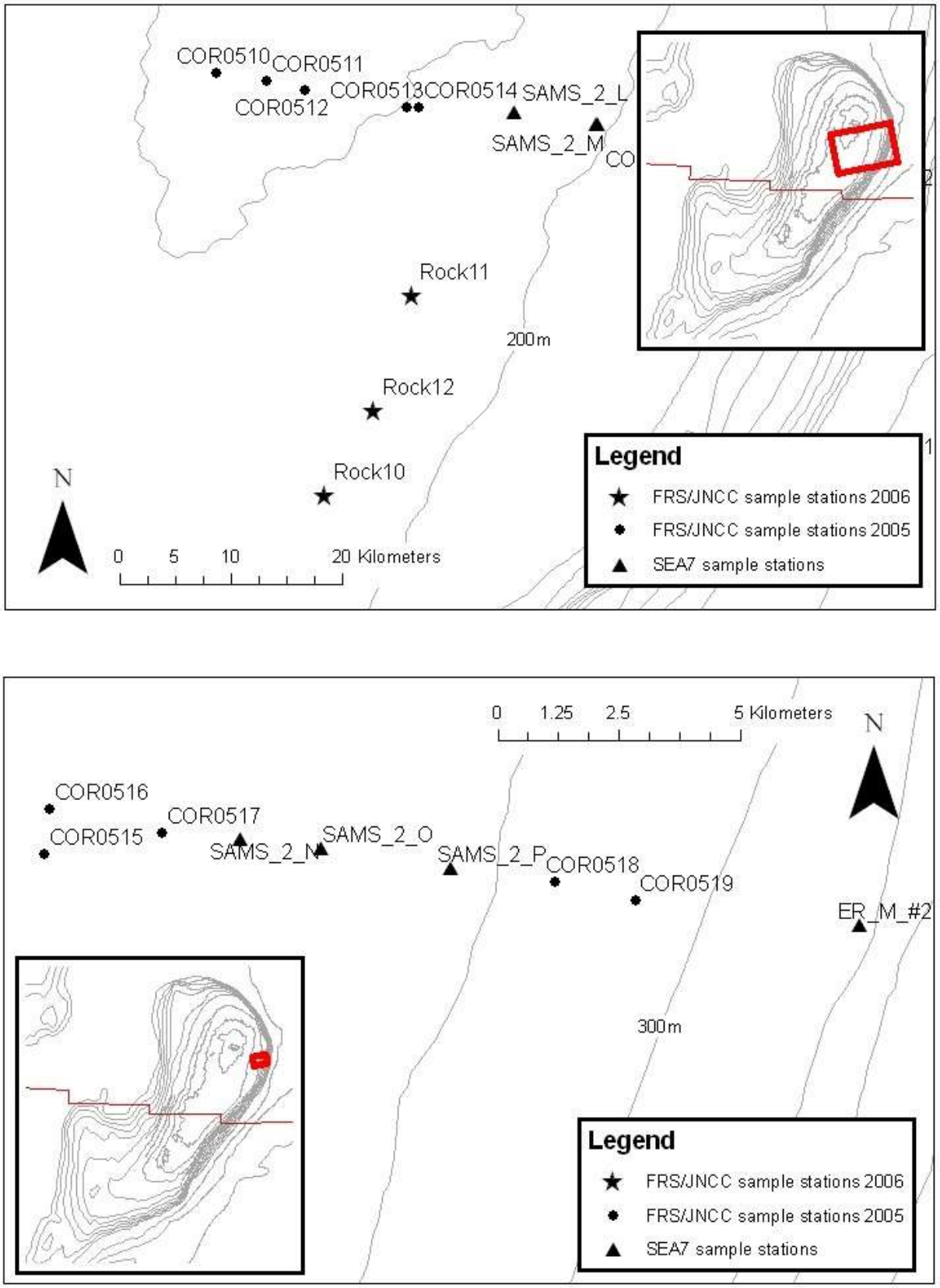


Figure 4.7: The central (top) and eastern (bottom) summit stations sampled on Rockall Bank. Bathymetry © GEBCO Digital Atlas, British Oceanographic Data Centre on behalf of IOC and IHO 1994 & 1997. The exact limits of the UK Continental Shelf are set out in orders made under section 1(7) of the Continental Shelf Act 1964 (© Crown Copyright).

Figure 4.8: Mega-ripple formations indicative of strong current activity. © JNCC/FRS/UoP.

The eastern summit region sampled (210-280m) was similar in character to the western summit region with areas of fine sand seabed scarred by iceberg ploughmarks (SAND, COS, BCLS) (Figure 4.7). However, delineation of each defined habitat was not as clear as in the west, in that the bands of cobbles and boulders crossed by the camera, associated with the edges of plough-marks, were not as distinct as in the west with areas of mixed cobble and pebbly sand (PACOS) present (Figures 4.9 and 4.10). Unlike the western region no *Lophelia pertusa* clumps were encountered although semi-buried coral fragments were observed. Analysis of the high resolution sidescan sonar data suggests there may be reef clumps present.

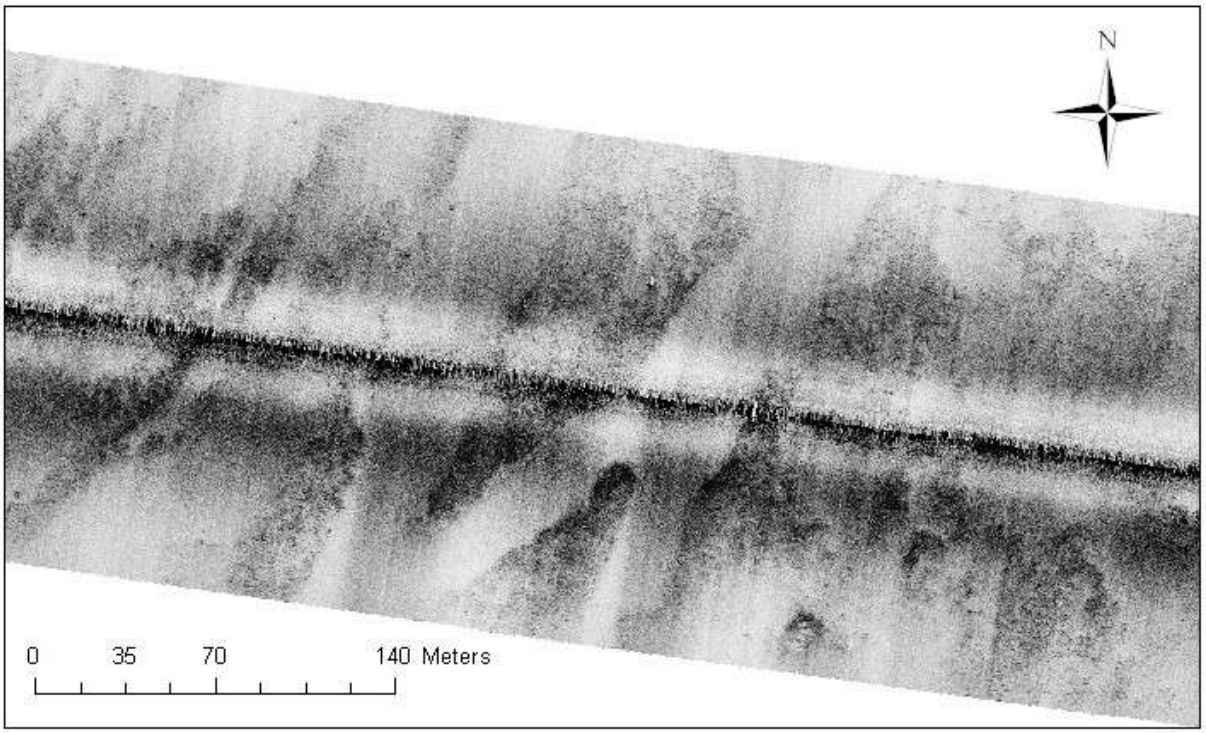


Figure 4.9: Sidescan sonar image of degraded iceberg ploughmarks on eastern Rockall Bank. Sidescan sonar data obtained from the Department of Trade and Industry Strategic Environmental Assessment 7, 2005. (© BERR).

Figure 4.10: Mixed cobble and pebble 'boarder' of a degraded iceberg ploughmark on eastern Rockall Bank. © JNCC/FRS/UoP.

The eastern flank of Rockall Bank (390-1600m) is more complex in terms of habitat than any of the summit areas sampled (Figure 4.11). Analysis of multibeam data suggests the area sampled comprises steep slopes between 400-750m depth. Mixed substrates of boulders, cobbles and pebbles with areas of exposed bedrock and bedrock outcrop were observed between 391-674m depth (BCLS, COS, PACOS, POS, BDRK, RCOC) with no one habitat type described as dominant (Figures 4.12 and 4.13). Clumps of *Lophelia pertusa* reef were also observed within this region with associated coral rubble fringes. The more southerly stations on the upper eastern flank (551-736m) were less complex with no bedrock or rock outcrop observed. However, these stations lay within an area of the flank identified as a sediment drift from the multibeam analysis (Figure 4.14). The deeper stations in this region (>1000m) exhibited very little habitat diversity with sandy mud giving way to mud as the dominant habitat type (MUD) (Figure 4.15). Near the1000m contour areas of cobbles and pebbles were still encountered (COS, PACOS) however with increasing depth the only hard substrate was provided by the occasional boulder (BOS).

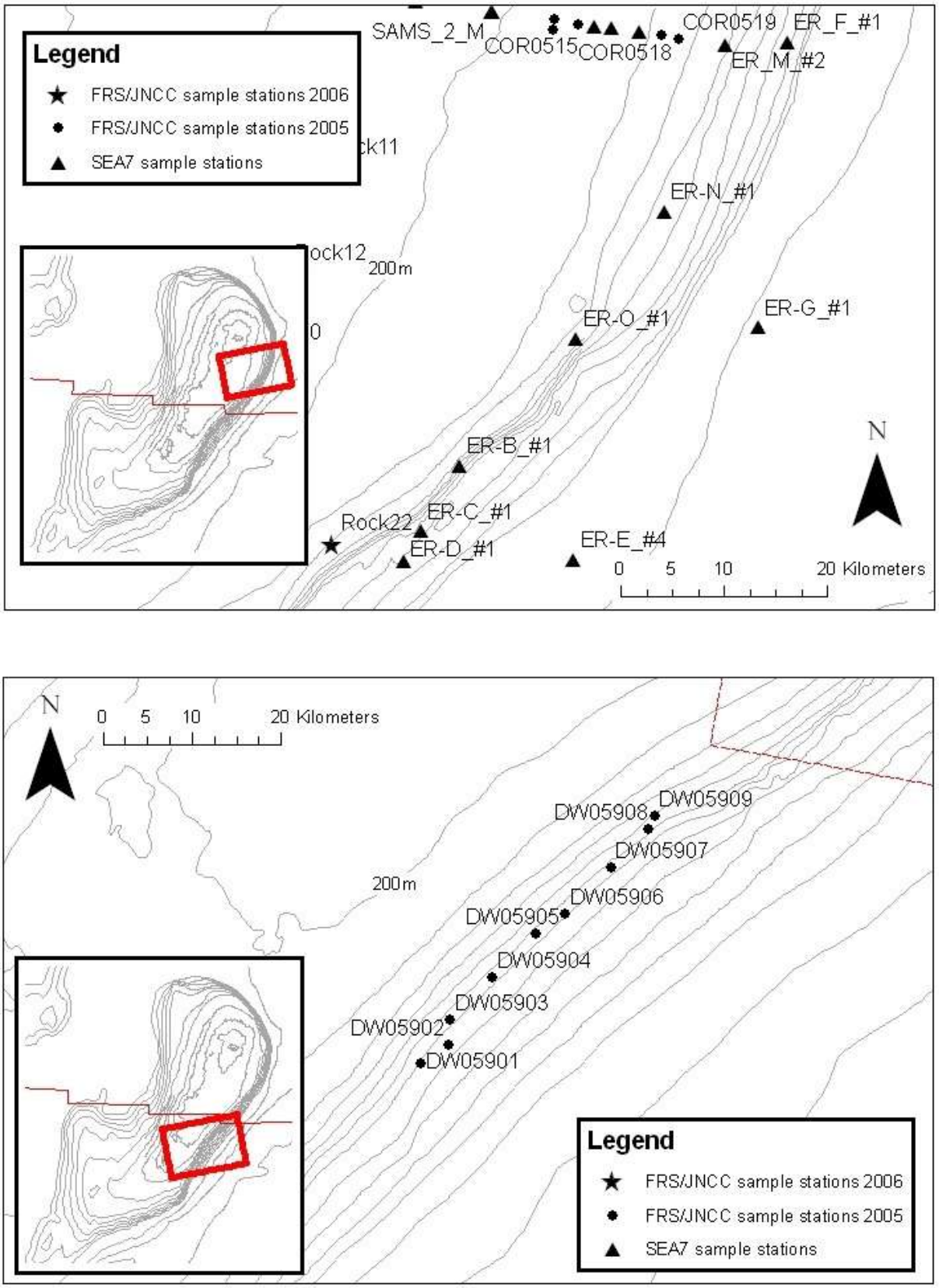


Figure 4.11: The eastern (top) and south-eastern (bottom) flank stations sampled on Rockall Bank. Bathymetry © GEBCO Digital Atlas, British Oceanographic Data Centre on behalf of IOC and IHO 1994 & 1997. The exact limits of the UK Continental Shelf are set out in orders made under section 1(7) of the Continental Shelf Act 1964 (© Crown Copyright).

Figure 4.12: Boulder and cobble areas on the eastern flank of Rockall Bank. Image obtained from the Department of Trade and Industry Strategic Environmental Assessment 7, 2005. (© BERR).

Figure 4.13: Exposed bedrock and boulder area on the eastern flank of Rockall. Image obtained from the Department of Trade and Industry Strategic Environmental Assessment 7, 2005. (© BERR).

Figure 4.14: Sand seabed within the sediment drift area on the eastern flank of Rockall Bank Image obtained from the Department of Trade and Industry Strategic Environmental Assessment 7, 2005. (© BERR).

Figure 4.15: Muddy habitat at the deeper stations on the eastern flank of Rockall Bank. Image obtained from the Department of Trade and Industry Strategic Environmental Assessment 7, 2005. (© BERR).

The south-eastern region of Rockall Bank sampled (428-585m) lay in an area of more gradual transition from summit to flank (Figure 4.11). This area was different in character again to the other regions of the bank sampled consisting almost entirely of muddy sand habitat (SAND) (Figure 4.16). At the shallowest and most northerly station a small patch of cobbles and pebbles were observed (COS, PACOS) however all other observations were of uniform muddy sand environment.

Figure 4.16: Muddy sand habitat from south-eastern region of Rockall Bank sampled. © JNCC/FRS/UoP.

The distribution of habitats on Rockall Bank described by this study support the previous findings of Blacker, (1982) who described Rockall Bank as showing a gradual transition from rocky outcrops around Rockall itself through low rock ridges or boulder fields partly covered in coarse carbonate sand (central region), to an almost complete cover of fine carbonate sand (western, north-western and eastern regions).

4.2 Annex 1 habitat distribution on Rockall Bank

4.2.1 Biogenic reef

Of the areas of Rockall Bank surveyed no extensive biogenic reef structures were observed although clumps of *Lophelia pertusa* reef were observed in the north-western and western summit areas and on the eastern flanks (Figure 4.17). Smaller growths of *L. pertusa* and another reef forming coral *Madrepora occulata* were observed at a greater number of stations but could not be classed as 'biogenic reef'. *L. pertusa* has been recorded previously on Rockall Bank (Wilson, 1979; Scoffin *et al*, 1980; Spiro *et al*, 2000; Kenyon *et al*, 2003;

Fisheries Research Services 2005, unpublished data) (Figure 4.18) and recently restored video taken from the submersible PISCES by Wilson in the late 1970's clearly demonstrates extensive areas of *L. pertusa* reef on central-northern summit region of Rockall Bank (Davies & Roberts, 2006). In addition the southern region of Rockall Bank within the Irish Continental Shelf Limit is known to support coral mound formations (Kenyon *et al*, 2003). However, of the 53 stations surveyed *L. pertusa* reef was only observed at four stations while reef rubble (evidence of reef) was observed at 11 stations (Figure 4.17), suggesting reef structure on Rockall Bank is patchily distributed. This supports the earlier findings of Wilson (1979).

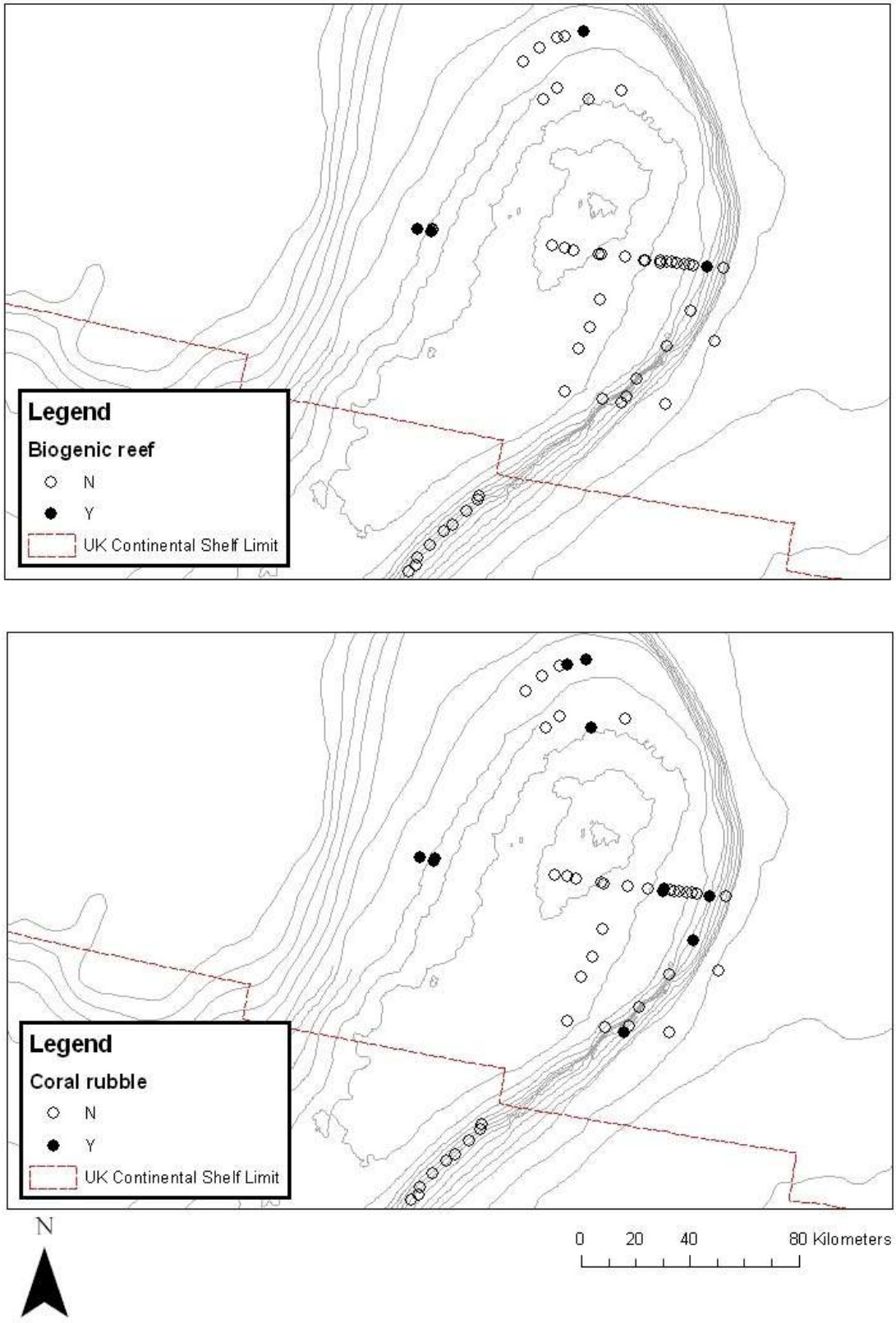
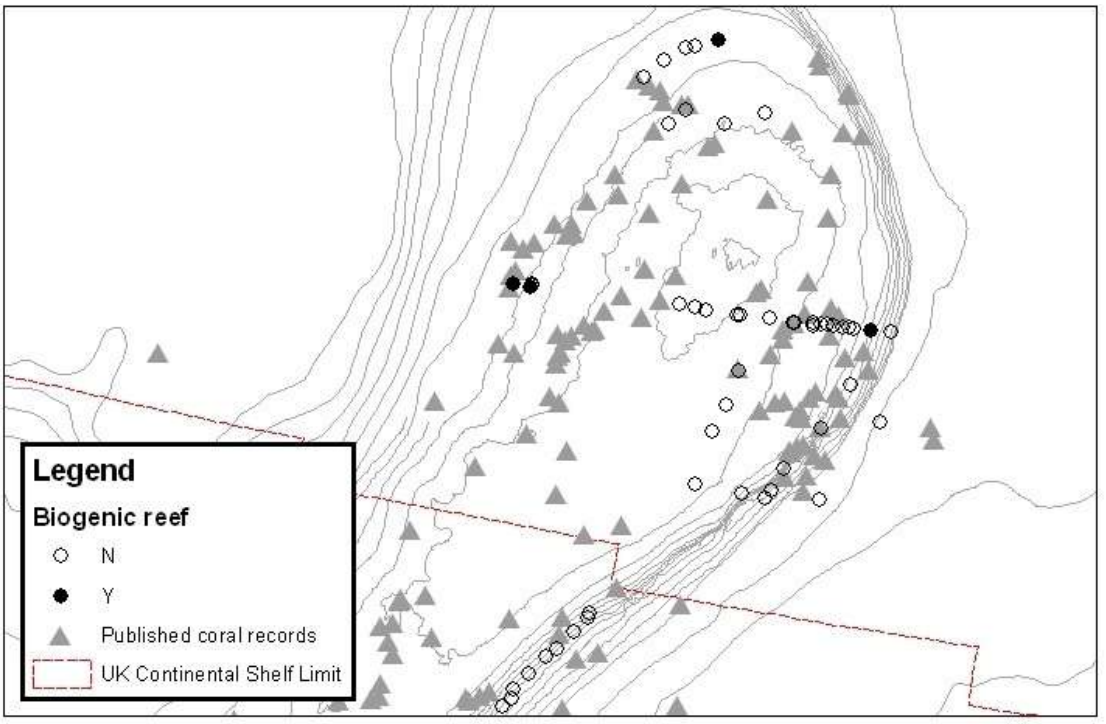


Figure 4.17: Distribution of *Lophelia pertusa* reef and associated rubble areas identified by this study. Bathymetry © GEBCO Digital Atlas, British Oceanographic Data Centre on behalf of IOC and IHO 1994 & 1997. The exact limits of the UK Continental Shelf are set out in orders made under section 1(7) of the Continental Shelf Act 1964 (© Crown Copyright).



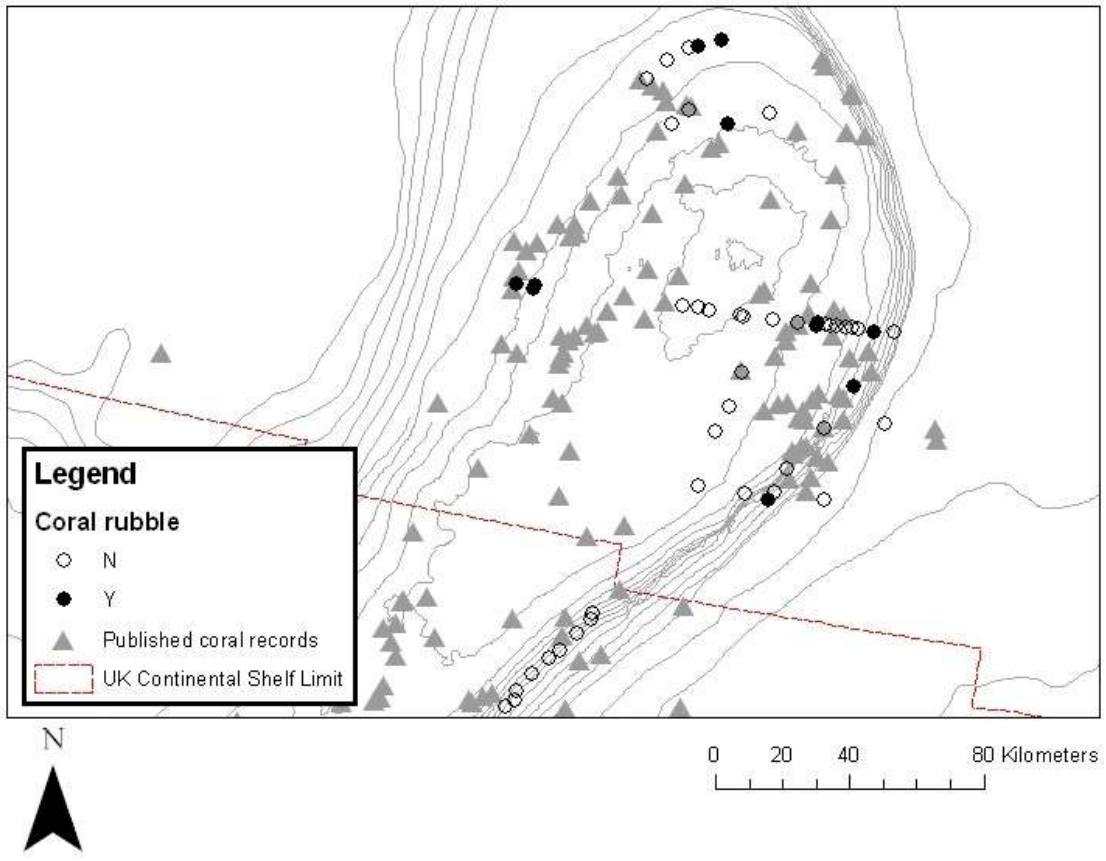


Figure 4.18: Distribution of *Lophelia pertusa* reef and associated rubble areas identified by this study and from historical records. Bathymetry © GEBCO Digital Atlas, British Oceanographic Data Centre on behalf of IOC and IHO 1994 & 1997. The exact limits of the UK Continental Shelf are set out in orders made under section 1(7) of the Continental Shelf Act 1964 (© Crown Copyright).

4.2.2 Rocky reef

Bedrock and rock outcrop were observed in the central and eastern areas sampled on Rockall Bank (Figure 4.19). Analysis of similarities (ANOSIM, PRIMER) found there was a significant difference ($p<1\%$) in the faunal composition between central and eastern flank regions, most likely a result of factors associated with the difference in depth between central (140-190m) and eastern flank (390-1600m) regions sampled. Characterising species of the central areas (SIMPER analysis in PRIMER) are encrusting sponges and bryozoans, *Reteporella* sp, cyclostome bryozoans, cup sponges (*Axinella* sp and *Phakelia* sp) and an unidentified coral/anemone species. Species characteristic of the eastern flank include encrusting sponges and bryozoans, *Ophiactis bali*, and unidentified encrusting forms. Hard substrate on the eastern flank had a greater percentage cover of unidentified encrusting species than occurred in central regions and species such as stylasterid corals, *Madrepora* sp were observed.

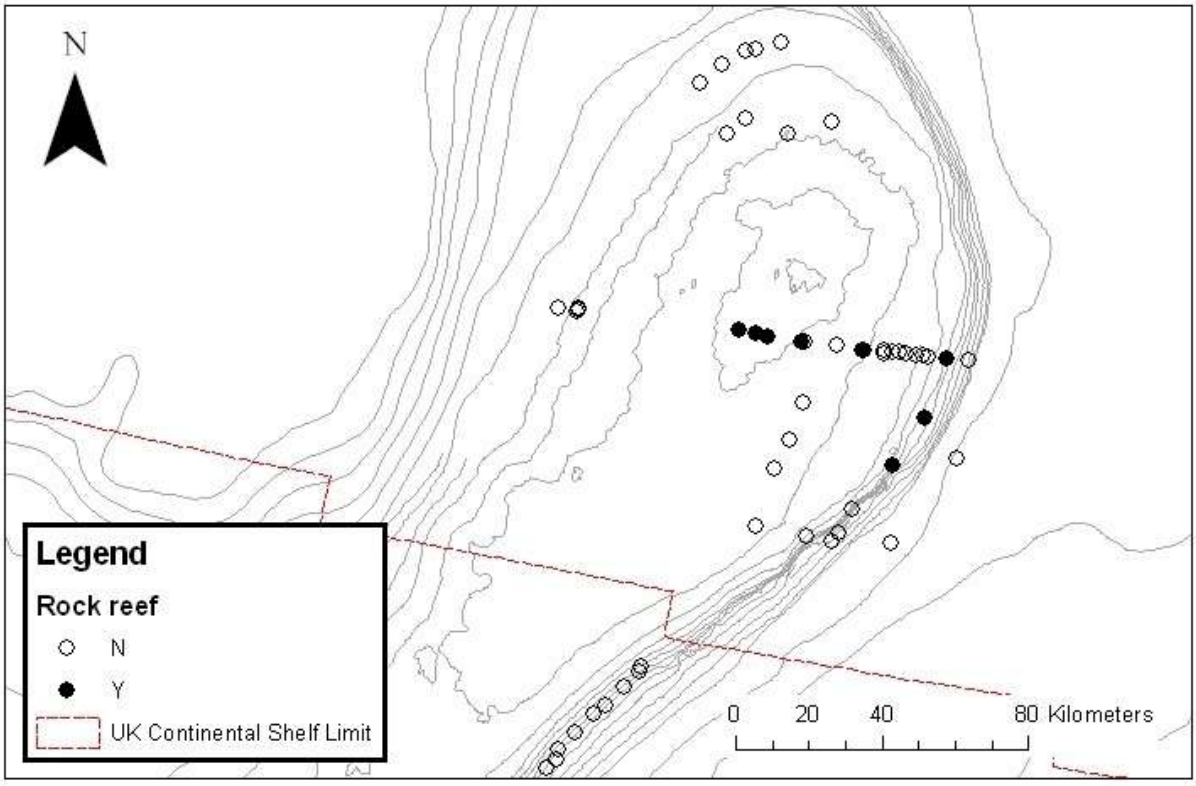


Figure 4.19: Distribution of rocky reef on Rockall Bank identified by this study. Bathymetry © GEBCO Digital Atlas, British Oceanographic Data Centre on behalf of IOC and IHO 1994 & 1997. The exact limits of the UK Continental Shelf are set out in orders made under section 1(7) of the Continental Shelf Act 1964 (© Crown Copyright).

The shallowest (140-190m) areas of rocky reef observed in the central region of Rockall Bank share some similarities with rocky habitat observed at similar (although slightly shallower at 53-140m) depth on the neighbouring continental shelf (Mitchell *et al*, 2005). Video and acoustic survey of areas of bedrock outcrop to the west of the Outer Hebrides revealed bedrock outcrop and bedrock often covered with fine layer of silt populated by diverse and abundant erect and branching sponges (*Axinella infundibuliformis, Polymastia* sp,

Phakellia ventilabrum, *Raspailia* sp), encrusting bryozoans, encrusting sponges, starfish, *Diazona violacea*, *Caryophyllia smithii* and *Pomatoceros triqueter*. The cup sponges *Axinella* sp and *Phakellia* sp, encrusting sponges and bryozoans are characteristic of both sites, and both *Caryophyllia smithii* and *Pomatoceros triqueter* were noted on Rockall Bank. However, the erect bryozoans *Reteporella* sp and cyclostome bryozoans, characteristic of this habitat on central Rockall Bank are not noted at the shelf site.

The rock reef areas on the eastern flank of Rockall Bank do not appear to be similar (in terms of faunal composition) to the rock reef areas of the continental shelf. This, as with the difference between central and flank regions of Rockall, is likely to be a result of the difference in depth between the two areas.

4.2.3 Stony reef

The definition of non biogenic reefs for the purposes of SAC selection in offshore waters is given as "Bedrock, boulders and cobbles (cobbles generally >64 mm in diameter), including those composed of soft rock, such as chalk. Biogenic concretions, i.e. aggregations of a species to form a hard substratum, thus enabling an epibiota community to develop" (Johnston *et al*, 2002). No indication is given as to the percentage coverage of boulder and cobble required in order to be classed as reef. Here we have assumed areas classified as BCLS and COS with 50% or more ground coverage within the field of view of the video camera qualifies as stony reef under the EU Habitats Directive.

Some of the cobble and boulder areas associated with iceberg plough-marks on the western, north-western and eastern regions of the bank summit could be classed as reef under the European Habitat Regulations definition. In addition some cobble and boulder areas that were associated with bedrock and rock outcrop regions in the central summit and eastern flank areas sampled could also be classed as reef. Figure 4.20 shows the distribution of stony reef habitat observed. Analysis of similarities (ANOSIM, PRIMER) found a significant difference in the faunal composition of stony reef between the central and eastern flank regions of the bank (P<1%). As with rocky reef this difference is most likely a result of factors associated with the difference in depth between central (140-190m) and eastern flank (390-1600m) regions sampled, although may also be a result of the frequency of disturbance of cobbles in the central bank region compared to the flank region. SIMPER analysis suggests that stony reef on the eastern flank of Rockall Bank has a greater percentage cover of encrusting organisms while keel worms are more abundant in central regions. Analysis of all species data suggest that species characteristic of stony reef habitat on Rockall Bank are the erect bryozoans *Reteporella* sp and cyclostome bryozoans, *Munida* sp, and unidentified encrusting sponges, bryozoans and serpulids.

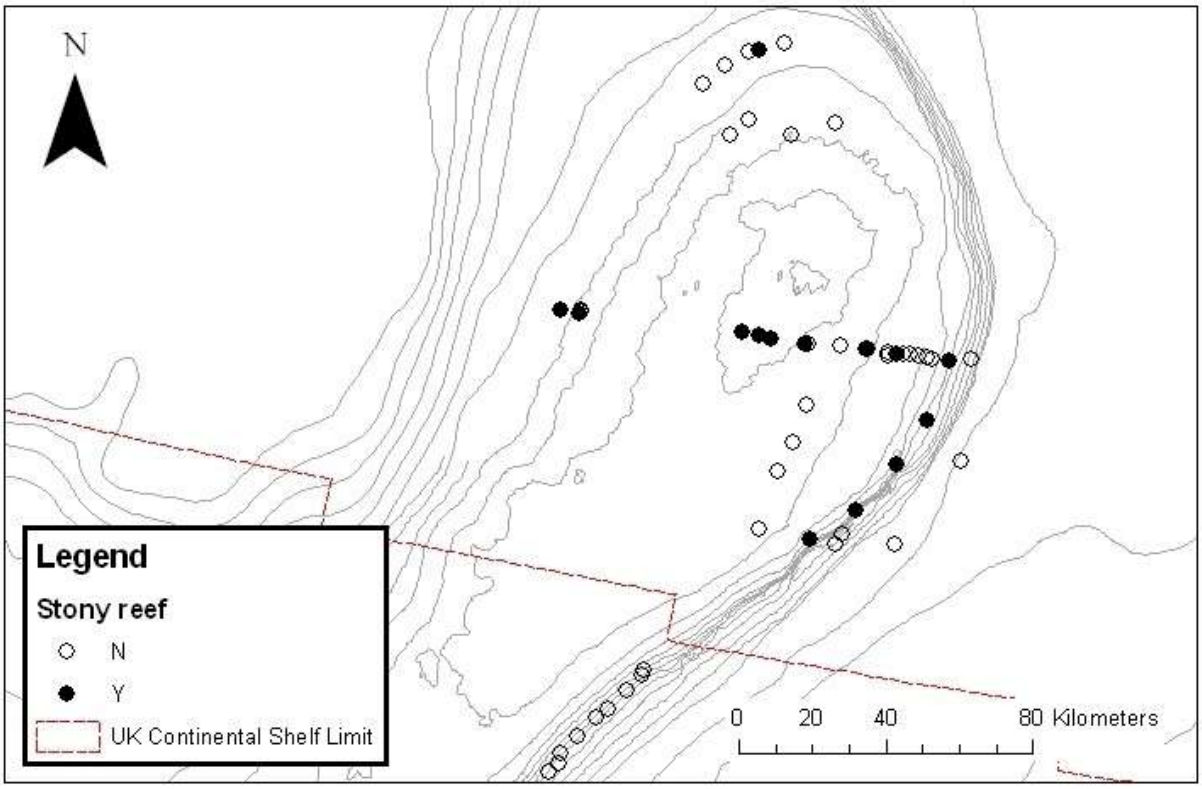


Figure 4.20: Distribution of stony reef on Rockall Bank identified by this study. Bathymetry © GEBCO Digital Atlas, British Oceanographic Data Centre on behalf of IOC and IHO 1994 & 1997. The exact limits of the UK Continental Shelf are set out in orders made under section 1(7) of the Continental Shelf Act 1964 (© Crown Copyright).

Axelsson (2003) describe the fauna of the cobble areas of the iceberg plough-marks on the UK continental slope in the Faeroe-Shetland Channel from photographic analysis. Cidarids and squat lobsters (*Munida* sp) were found to be characteristic of the 'coarse' sediment, dominated by gravel, pebbles and cobbles. *Munida* sp are described as characteristic of both Faeroe-Shetland Channel and Rockall Bank cobble areas. While no specific mention of the erect bryozoans *Reteporella* sp and cyclostome bryozoans is made by Axelsson (2003) from the stony reef areas of the Faeroe-Shetland Channel, bryozoans as a group are recorded. Although it is likely the stony reef areas of the Faeroe-Shetland Channel iceberg plough-marks are faunally similar to the stony reef areas of the iceberg plough-marks on Rockall Bank this could only be confirmed through a reanalysis of the Faeroe-Shetland Channel data. In the neighbouring Porcupine Seabight Foubert *et al* (2005) describe large boulders within drop-stone dominated seabed facies as being abundantly covered by barnacles (*Bathylasma* sp) serpulids, encrusting sponges and bryozoans, with very little other encrusting fauna. This facies is again broadly comparable to stony reef habitat on Rockall Bank. The most notable feature of this habitat from all three neighbouring regions is the lack of a dense encrusting fauna, particularly the lack of coral and anemone species described from neighbouring coral mounds (Foubert *et al*, 2005; Huvenne *et al*, 2005).

4.3 Evidence of human activity

Evidence of fishing activity was observed in the form of trawl marks and lost gear at six of the 59 stations sampled (Figure 4.21). Specifically in the south-eastern region of the bank a

discarded fishing net (Figure 4.22) and several trawl marks were observed in an area that is fished for *Nephrops*. In the north-western region some areas of biogenic reef showed damage from the activities of bottom trawling, with furrows and gouges in the sediment, produced by the passage of the heavy trawl doors along the seabed, clearly visible. It is not clear whether the reef framework was live or dead prior to destruction from trawling however recent research has suggested that intact dead reef framework provides an important habitat for a diverse community of species (Freiwald *et al*, 2004). Therefore trawling damage to live or dead reef framework is undesirable.

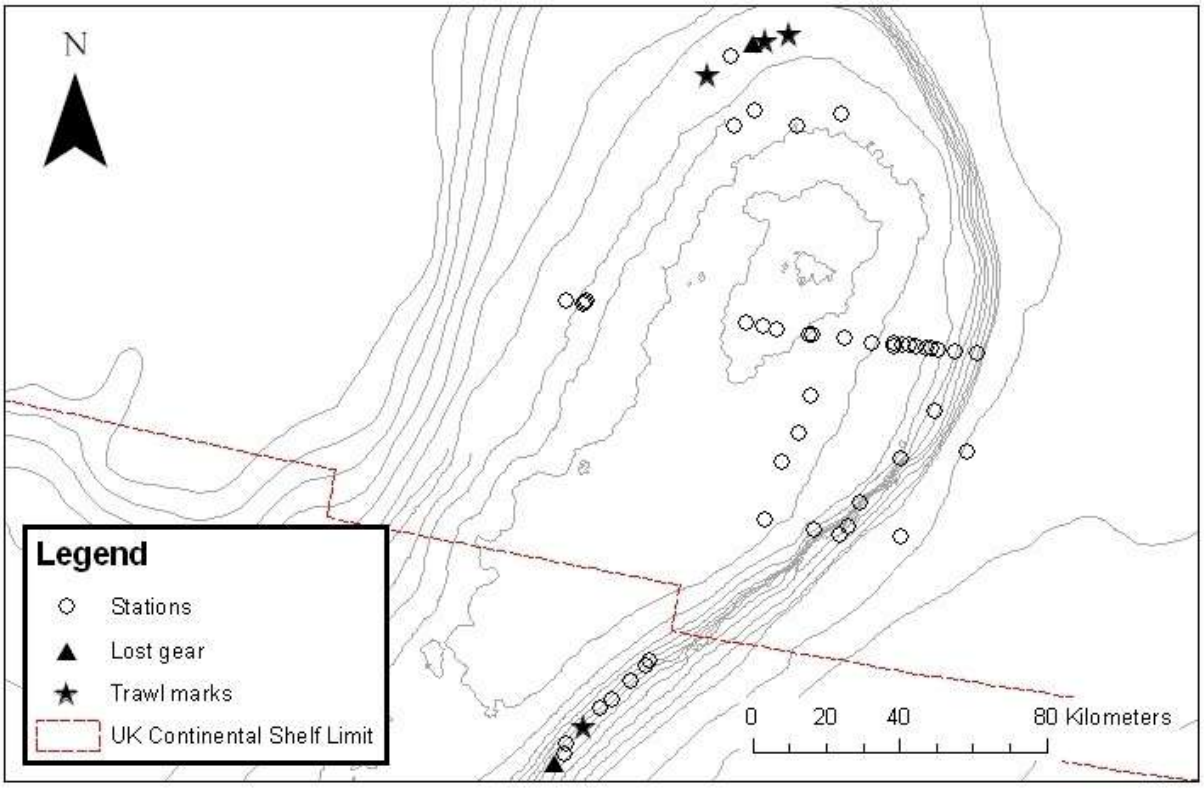


Figure 4.21: Evidence of human activities observed from seabed video. Bathymetry © GEBCO Digital Atlas, British Oceanographic Data Centre on behalf of IOC and IHO 1994 & 1997. The exact limits of the UK Continental Shelf are set out in orders made under section 1(7) of the Continental Shelf Act 1964 (© Crown Copyright).

Figure 4.22: Discarded fishing net observed in the south-eastern region of the Bank © JNCC/FRS/UoP.

Fishing activity is not spread uniformly over Rockall Bank. Certain areas are targeted while others are clearly avoided (ICES, 2005). The areas of trawl damaged reef (and intact reef) observed in the north-western region of the bank are on the edge of a region of low fishing activity (ICES, 2005). This region of low fishing activity is suspected to be occupied by dense areas of *L. pertusa* reef, which are actively avoided by fishermen for fear of damaging both gear and catch (Hall-Spencer, pers com). The areas of intact reef observed in the western region of the bank are within this area of low fishing activity.

The central bank area, (rock and stony reef present), eastern summit (rock and stony reef present) and flank regions of Rockall Bank (all three Annex I reef types present) are all heavily fished (ICES, 2005). The observed areas of intact reef on the eastern flank are in a region identified by ICES as supporting *L. pertusa* but subject to heavy fishing activity. No *L. pertusa* clumps were encountered on the eastern summit although semi-buried coral fragments and observations from the high resolution sidescan sonar suggest this area may once have supported reef habitat prior to the development of fishing activity.

5 Conclusions

5.1 Priority areas

The eastern flank of Rockall Bank supported all three Annex I reef types. It is the most complex, in terms of habitat, of all the areas sampled, comprising steep slopes, mixed substrates of boulders, cobbles and pebbles with areas of exposed bedrock and bedrock outcrop, with no one habitat type described as dominant. In addition a number of historical records of the occurrence of *L. pertusa* are focused in this region. This area would be suitable for notification as a Special Area for Conservation under the European Habitats Directive.

The largest extent of biogenic reef was recorded in western and north western areas surveyed. These areas also support stony reef in the form of iceberg plough-marks. This area would be suitable for notification as a Special Area for Conservation under the European Habitats Directive.

The central and eastern flank rock reef habitats were found to have a significantly different faunal composition, most likely to be a result of the different depths of sampling. In order to fully represent the range of different faunal communities associated with offshore rocky reef habitat it may be appropriate to consider parts of the central area sampled for notification as a Special Area for Conservation.

It should be stated that the deeper flank areas of Rockall Bank were not sampled but are likely to support Annex I reef habitat based on observations from other banks and seamounts in the NE Atlantic, and may offer a more suitable option for SAC selection.

5.2 Assessment of current area closures and proposed ICES modifications to the boundaries

The ICES working group on deep-sea ecology (WGDEC) have already compiled data on the occurrence of the cold water coral *Lophelia pertusa* on Rockall Bank, following a request from NEAFC for advice on possible area closures for their protection (see section 4.3). Analysis of these data led ICES to suggest two areas within the UK continental shelf limit that could be considered for closure for the protection of cold water corals (Figure 5.1) (ICES, 2005) referred to here as the North West Rockall area and the Eastern Rockall area. NEAFC agreed to close the international parts of the North West Rockall area, (as well as the international parts of the Logachev Mounds and the West Rockall Mounds) to bottom trawling and static gears (including bottom gillnets and long lines); this measure came into place on 1 January 2007, with formal closure on 8 March 2007 (NEAFC recommendation IX, 2007). The North West Rockall area straddles the NEAFC/EU EEZ. The EU also closed North West Rockall (and the Logachev Mounds) (both within and outside the EEZ) on 20 January 2007 (EC 41/2006 of 21 December 2006) effectively establishing a coherent EU/high seas closure of the North West Rockall area. The Eastern Rockall area suggested by ICES was not closed.

The North West Rockall area currently closed by NEAFC and the EU would be suitable for notification as a SAC under the European Habitats Directive for the protection of cold water coral reef. Minor modification to the existing boundary would provide suitable protection for

not only biogenic reef habitat, but also stony reef habitat. The boundary of the North-West Rockall closed area currently does not contain within it the areas of biogenic reef and stony reef identified in this survey (Figure 5.1). Since the draft version of this report was produced ICES WGDEC have recommended that the boundary of the North-West Rockall area be modified in order to protect the biogenic reef areas identified by this study (ICES, 2007). The new boundary proposed by ICES (ICES, 2007) would provide protection for both biogenic reef and stony reef identified here.

The Eastern Rockall area suggested by ICES as an appropriate area to close for the protection of cold water corals (ICES 2005) (Fig 5.1) would incorporate the habitat diverse eastern flank region sampled in this study and parts of the faunally distinct rocky and stony reef habitat of the central region sampled in this study. However coral rubble areas (indicative of adjacent reef) observed at the southern most stations sampled on the eastern flank region fall outside of the proposed ICES boundary (Figure 5.1).

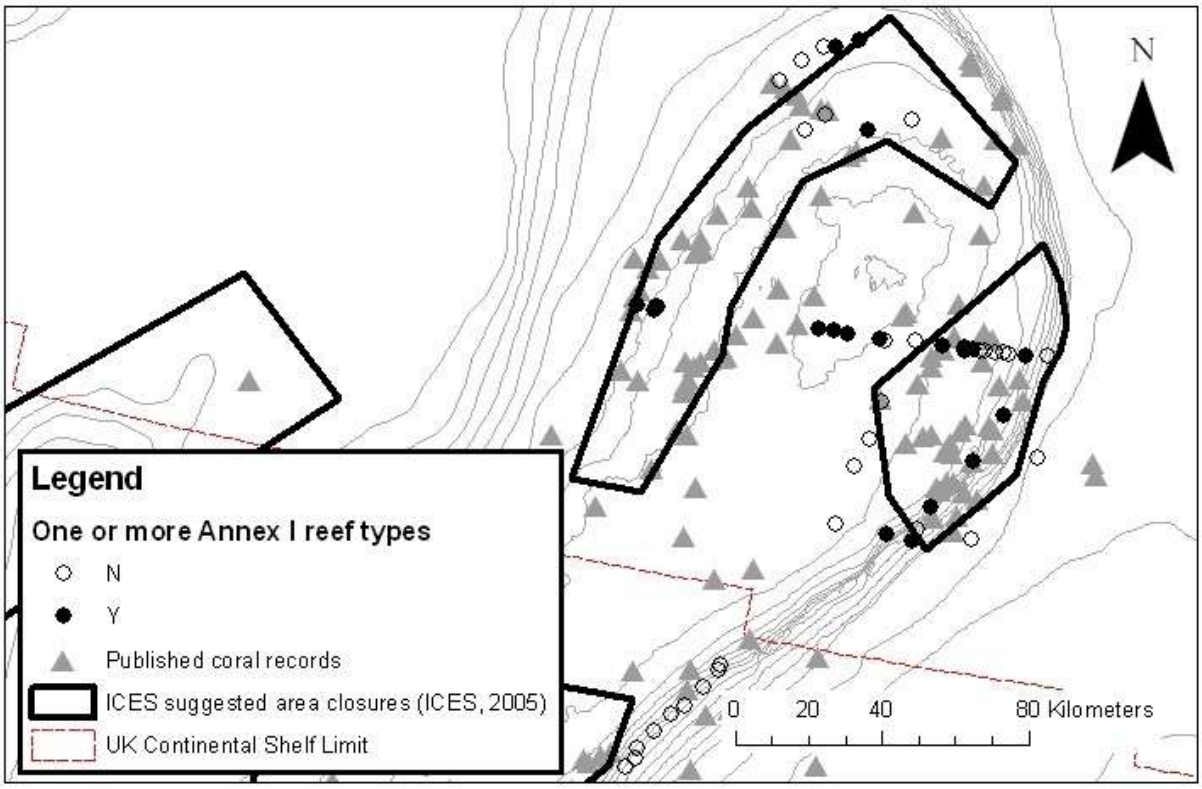


Figure 5.1: Areas suggested by ICES as suitable for consideration for closure for the protection of cold water corals. Bathymetry © GEBCO Digital Atlas, British Oceanographic Data Centre on behalf of IOC and IHO 1994 & 1997. The exact limits of the UK Continental Shelf are set out in orders made under section 1(7) of the Continental Shelf Act 1964 (© Crown Copyright).

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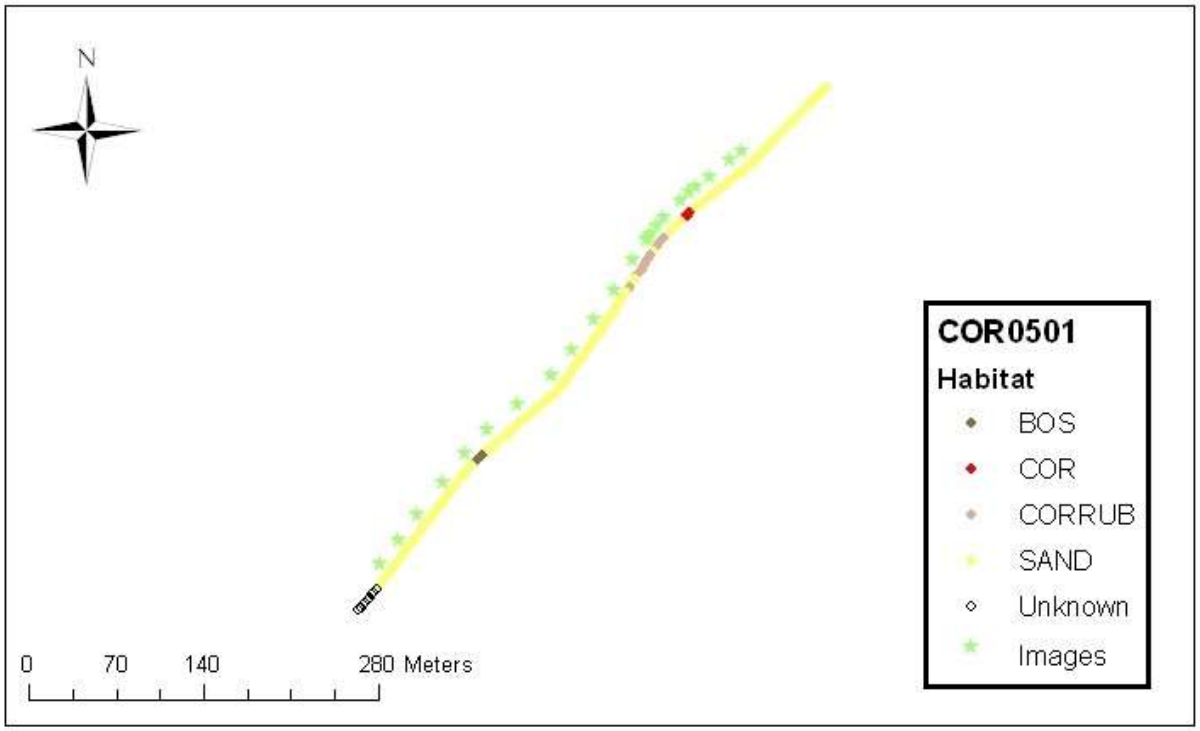
Appendix 1: JNCC/FRS/UoP Video and stills survey station locations

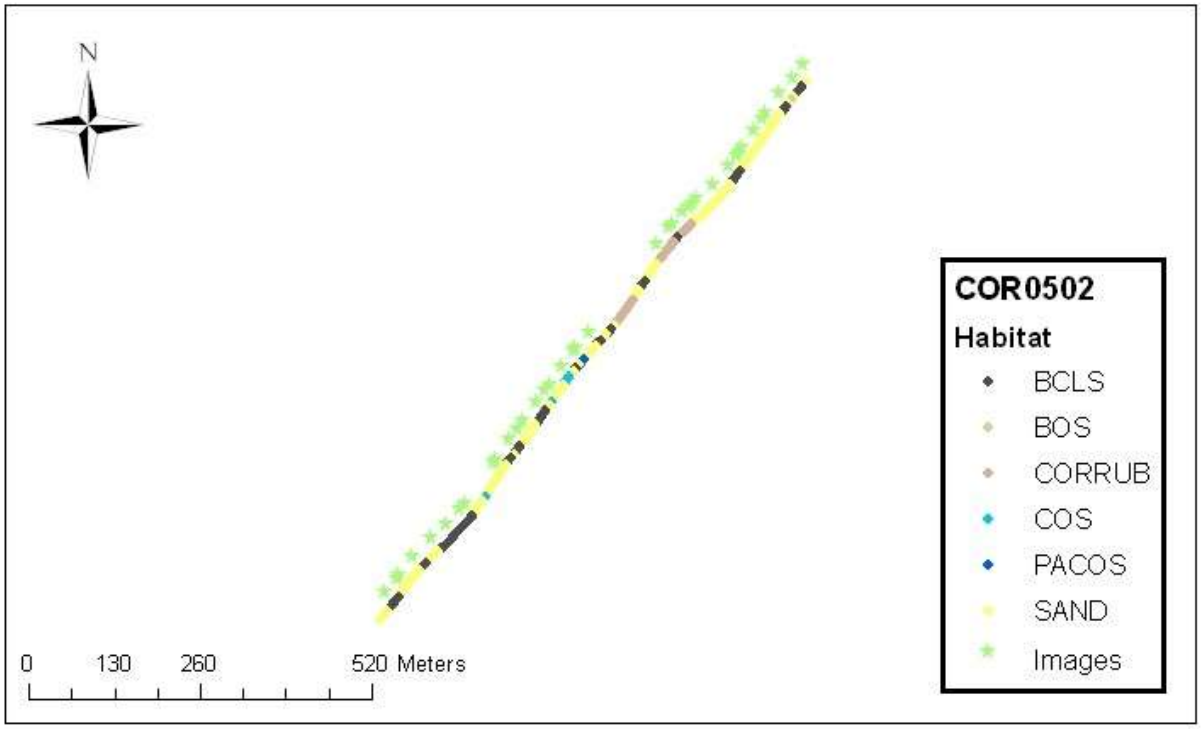
Sample	Method	Start Long DD	Start Lat DD	End Long DD	End Lat DD	Projection	Depth (m)	Time	Date	Video duration	No. successful images	Live Biogenic Reef	Evidence of biogenic reef (Coral rubble)	Rocky reef	Stony reef	Human activity
COR0501	Video (Towed)	-13.9530	58.1820	-13.9580	58.1770	WGS84	327	21:36:43	04/09/2005	00:20:00	23	Y	Y	N	N	Trawl marks
COR0502	Video (Towed)	-14.0580	58.1550	-14.0660	58.1470	WGS84	303	22:59:13	04/09/2005	00:31:00	38	N	Y	N	Y	Trawl marks
COR0503	Video (Towed)	-14.1090	58.1480	-14.1150	58.1440	WGS84	311	00:22:43	05/09/2005	00:21:00	16	N	N	N	N	Lost gear
COR0504	Video (Towed)	-14.2020	58.1060	-14.2110	58.1020	WGS84	344	01:35:18	05/09/2005	00:20:00	12	N	N	N	N	
COR0505	Video (Towed)	-14.2870	58.0480	-14.2940	58.0460	WGS84	331	02:56:43	05/09/2005	00:16:00	10	N	N	N	N	Trawl marks
COR0506	Video (Drop down)	-14.7320	57.4470	-14.7240	57.4530	WGS84	335	21:41:13	05/09/2005	00:30:00	17	Y	Y	N	Y	
COR0507	Video (Drop down)	-14.6520	57.4440	-14.6410	57.4500	WGS84	285	23:01:53	05/09/2005	00:50:00	24	Y	Y	N	Y	
COR0508	Video (Drop down)	-14.6460	57.4500	-14.6410	57.4520	WGS84	283	00:30:33	06/09/2005	00:23:00	none	N	Y	N	N	
COR0509	Video (Drop down)	-14.6430	57.4530	-14.6390	57.4550	WGS84	280	02:04:04	06/09/2005	00:31:00	11	N	N	N	N	
COR0510	Video (Drop down)	-13.9106	57.4707	-13.9150	57.4725	WGS84	142	19:50:00	08/09/2005	00:20:00	12	N	N	Y	Y	
COR0511	Video (Drop down)	-13.8341	57.4712	-13.8316	57.4707	WGS84	145	21:00:00	08/09/2005	00:30:00	none	N	N	Y	Y	
COR0512	Video (Drop down)	-13.7747	57.4698	-13.7711	57.4661	WGS84	146	22:40:00	08/09/2005	00:30:00	12	N	N	Y	Y	
COR0513	Video (Drop down)	-13.6223	57.4703	-13.6222	57.4679	WGS84	155	00:06:58	09/09/2005	00:31:00	19	N	N	Y	Y	
COR0514	Video (Drop down)	-13.6042	57.4711	-13.6043	57.4701	WGS84	154	01:17:36	09/09/2005	00:16:00	6	N	N	N	N	
COR0515	Video (Drop down)	-13.2373	57.4766	-13.8558	57.4727	WGS84	230	03:21:37	09/09/2005	00:30:00	14	N	Y	N	N	
COR0516	Video (Drop down)	-13.2380	57.4850	-13.2480	57.4820	WGS84	227	18:08:49	09/09/2005	00:31:00	18	N	Y	N	N	
COR0517	Video (Drop down)	-13.1990	57.4840	-13.2062	57.4827	WGS84	232	19:45:34	09/09/2005	00:30:00	7	N	N	N	Y	
COR0518	Video (Drop down)	-13.0640	57.4870	-13.0640	57.4860	WGS84	260	21:39:49	09/09/2005	00:08:00	none	N	N	N	N	
COR0519	Video (Drop down)	-13.0360	57.4860	-13.0400	57.4850	WGS84	281	22:31:59	09/09/2005	00:31:00	3	N	N	N	N	

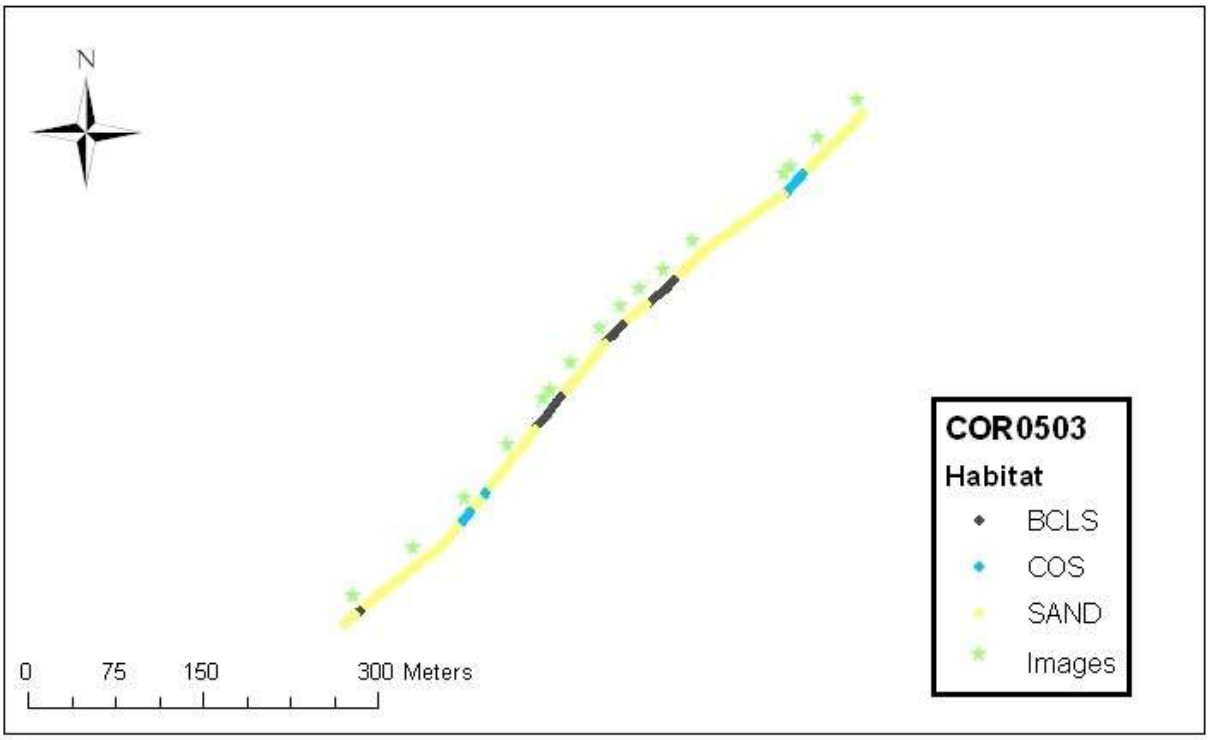
DW05901	Video (Towed)	-14.4100	56.3350	-14.4240	56.3340	WGS84	542	21:05:29	06/09/2005	00:30:00	11	N	N	N	N	Lost gear
DW05902	Video (Towed)	-14.3690	56.3590	-14.3810	56.3590	WGS84	585	22:47:04	06/09/2005	00:26:00		N	N	N	N	
DW05903	Video (Towed)	-14.3730	56.3840	-14.3890	56.3840	WGS84	509	00:16:49	06/09/2005	00:30:00	9	N	N	N	N	
DW05904	Video (Towed)	-14.3120	56.4330	-14.3260	56.4340	WGS84	512	01:56:29	07/09/2005	00:30:00	8	N	N	N	N	Trawl marks
DW05905	Video (Towed)	-14.2490	56.4830	-14.2590	56.4810	WGS84	515	20:52:35	07/09/2005	00:20:00	1	N	N	N	N	
DW05906	Video (Towed)	-14.2030	56.5090	-14.2100	56.5090	WGS84	535	22:27:00	07/09/2005	00:17:00	none	N	N	N	N	
DW05907	Video (Towed)	-14.1360	56.5620	-14.1470	56.5610	WGS84	509	23:51:10	07/09/2005	00:25:00	none	N	N	N	N	
DW05908	Video (Towed)	-14.0810	56.6060	-14.0890	56.6040	WGS84	482	01:29:00	08/09/2005	00:20:00	none	N	N	N	N	
DW05909	Video (Towed)	-14.0750	56.6210	-14.0830	56.6180	WGS84	428	02:40:40	08/09/2005	00:21:00	1	N	N	N	N	
ER_F_#1	Video (Drop down)	628141.27	6374974.69	628185.66	6374875.8	UTM 28N	1030.0	08:01:20	17/08/2005	00:42:00	37	N	N	N	N	
ER_M_#2	Video (Drop down)	622320.3	6373586.7	622881.8	6373599.5	UTM 28N	401.0	17:34:35	17/08/2005	01:28:00	34	Y	Y	Y	Y	
SAMS_2_P_#1	Video (Drop down)	613905.1	6373149.1	613982.7	6373070.6	UTM 28N	237.0	21:22:10	17/08/2005	00:24:57	10	N	N	N	N	
SAMS_2_O_#4	Video (Drop down)	611228.42	6373034.31	611176.9	6372993.2	UTM 28N	210.0	2:50:26	18/08/2005	00:30:03	17	N	N	N	N	
SAMS_2_N_#1	Video (Drop down)	609552.2	6372883.17	609550.84	6372772.4	UTM 28N	221.0	4:38:12	18/08/2005	00:31:52	17	N	N	N	N	
SAMS_2_M_#2	Video (Drop down)	599502.9	6372348.1	599611.2	6372357.3	UTM 28N	187.3	9:41:52	18/08/2005	00:22:36	17	N	N	Y	N	
SAMS_2_M_#3	Video (Drop down)	599625.5	6372355.8	599780.3	6372377.5	UTM 28N	188.8	10:25:54	18/08/2005	00:34:53	40	N	N	N	Y	
SAMS_2_L_#5	Video (Drop down)	592162.8	6371969.4	592311.1	6371947.5	UTM 28N	165.3	15:24:00	18/08/2005	00:40:51	17	N	N	N	N	
ER-N_#1	Video (Drop down)	619534.7	6356608.3	620434.7	6355957.1	UTM 28N	406.5	17:09:30	19/08/2005	02:39:40	57	N	Y	Y	Y	
ER-G_#1	Video (Drop down)	630617.6	6347347.1	630712.3	6347225.2	UTM 28N	1546.5	21:53:00	19/08/2005	00:26:10	10	N	N	N	N	
ER-O_#1	Video (Drop down)	613541.3	6342966.2	614162.8	6341263.6	UTM 28N	391.0	6:32:46	20/08/2005	03:00:25	89	N	N	Y	Y	
ER-E_#4	Video (Drop down)	617304.1	6321942.3	617367.2	6321855.8	UTM 28N	1598.5	16:37:40	20/08/2005	00:11:58	4	N	N	N	N	
ER-B_#1	Video (Drop down)	604795.8	6328745.8	605008.7	6328628.8	UTM 28N	551.3	19:45:00	20/08/2005	00:30:55	22	N	N	N	Y	
ER-C_#1	Video (Drop down)	602357.7	6321853.7	602408.1	6321729.2	UTM 28N	645.0	0:09:11	21/08/2005	00:30:24	13	N	N	N	N	

ER-D_#1	Video (Drop down)	601237.6	6318667.2	601243.0	6318528.6	UTM 28N	731.0	3:38:26	21/08/2005	00:30:24	17	N	Y	N	N	
ER_L_#1	Video (Drop down)	553418.0	6484729.9	553378.9	6484693.4	UTM 28N	1124.7	18:20:00	26/08/2005	00:23:44	12	N	N	N	N	
Rock_1	Video (Drop down)	-14.0477	57.9855	57.9875	-14.0455	WGS84	245	23:20:36	10/09/2006	00:31:19	0	N	N	N	N	
Rock_3	Video (Drop down)	-13.6521	58.0128	58.0105	-13.6533	WGS84	224	02:45:14	11/09/2006	00:21:24	18	N	N	N	N	
Rock_4	Video (Drop down)	-14.1250	57.9410	57.9430	-14.1213	WGS84	237	21:51:50	10/09/2006	00:31:57	6	N	N	N	N	
Rock_5	Video (Drop down)	-13.8432	57.9674	57.9658	-13.8450	WGS84	205	01:20:45	11/09/2006	00:26:43	0	N	Y	N	N	
Rock_10	Video (Drop down)	-13.6438	57.1532	57.1494	-13.6437	WGS84	191	01:13:47	12/09/2006	00:31:12	0	N	N	N	N	
Rock_11	Video (Drop down)	-13.5677	57.3227	57.3181	-13.5630	WGS84	179	03:04:09	12/09/2006	00:30:47	26	N	N	N	N	
Rock_12	Video (Drop down)	-13.5937	57.2268	57.2239	-13.5891	WGS84	190	04:20:09	12/09/2006	00:27:40	27	N	N	N	N	
Rock_13	Video (Drop down)	-13.6781	57.0064	57.0059	-13.6766	WGS84	193	21:50:48	11/09/2006	00:30:55	18	N	N	N	N	
Rock_22	Video (Drop down)	-13.4495	57.0032	56.9995	-13.4393	WGS84	333	23:23:54	11/09/2006	00:30:54	0	N	N	N	Y	

Appendix 2: Defined substratum classes for video tows



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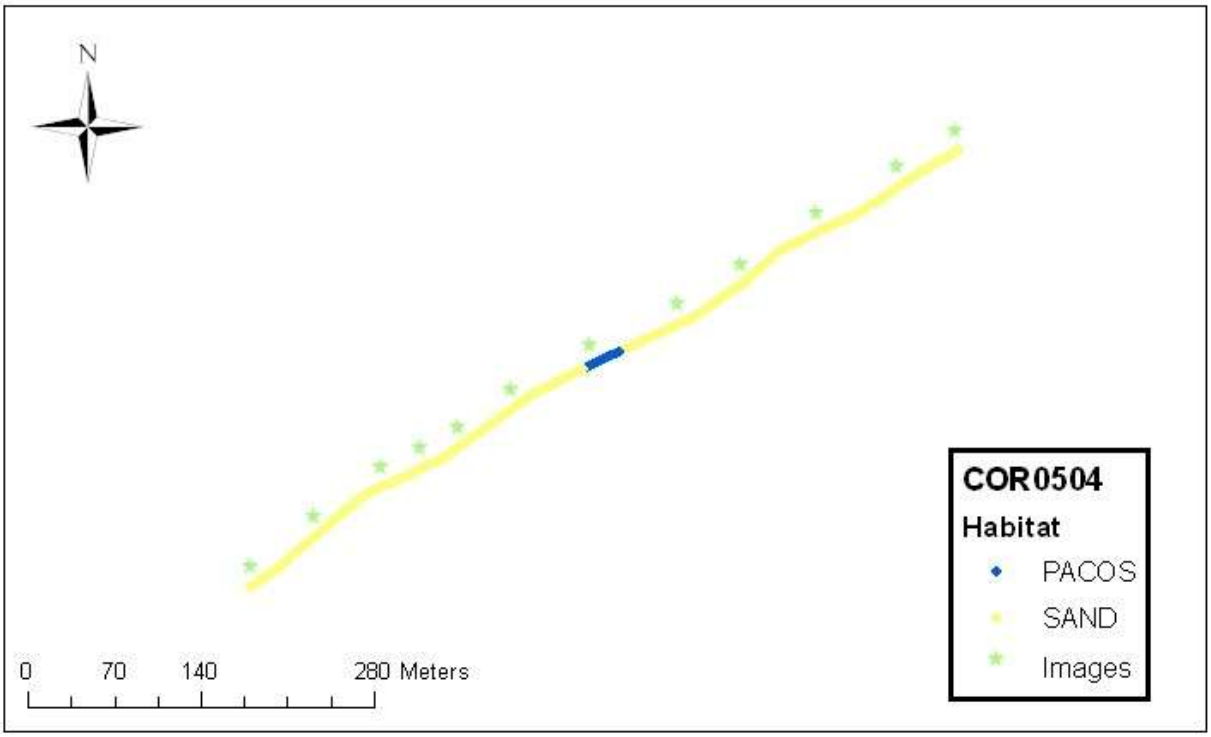
COR0503
Habitat
BCLS
COS
SAND
Images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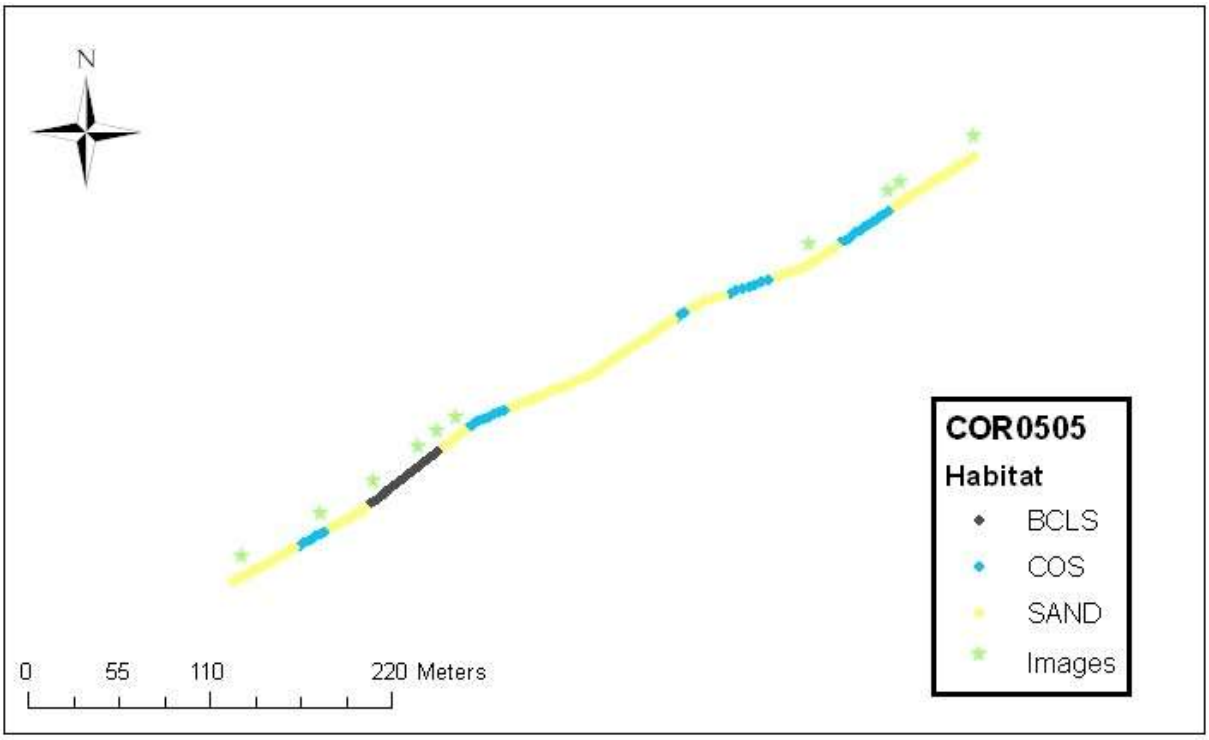
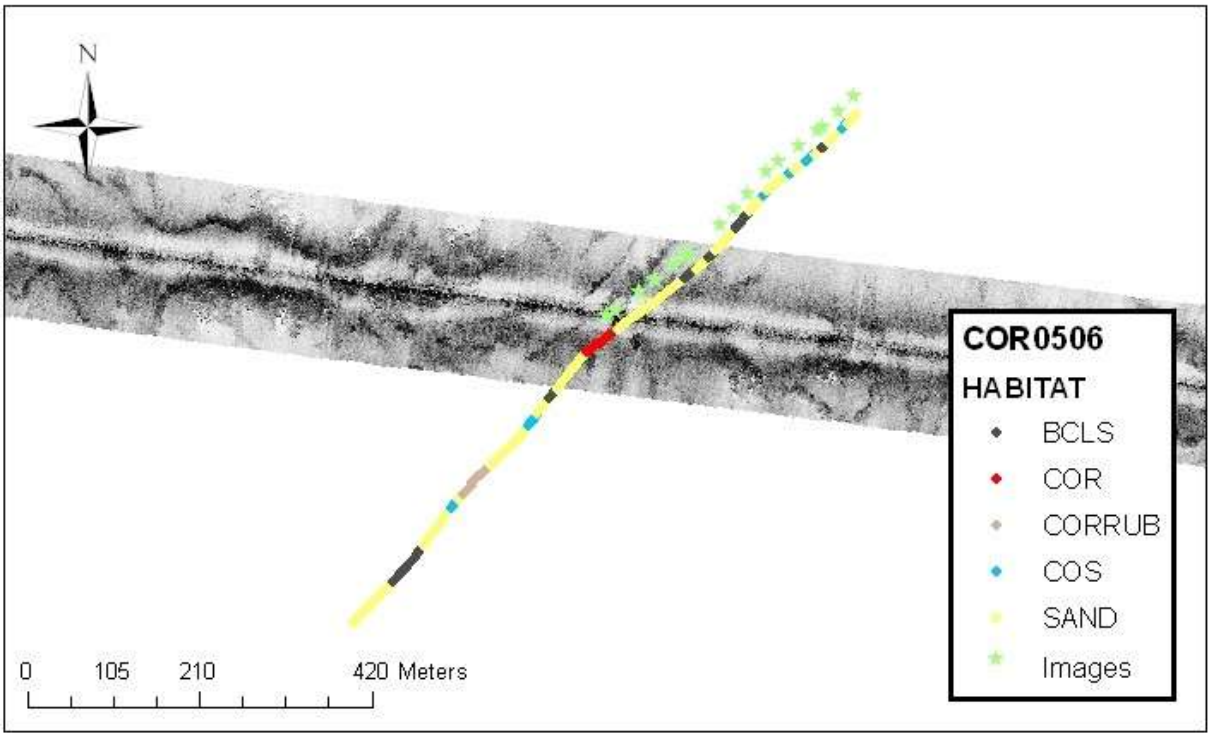
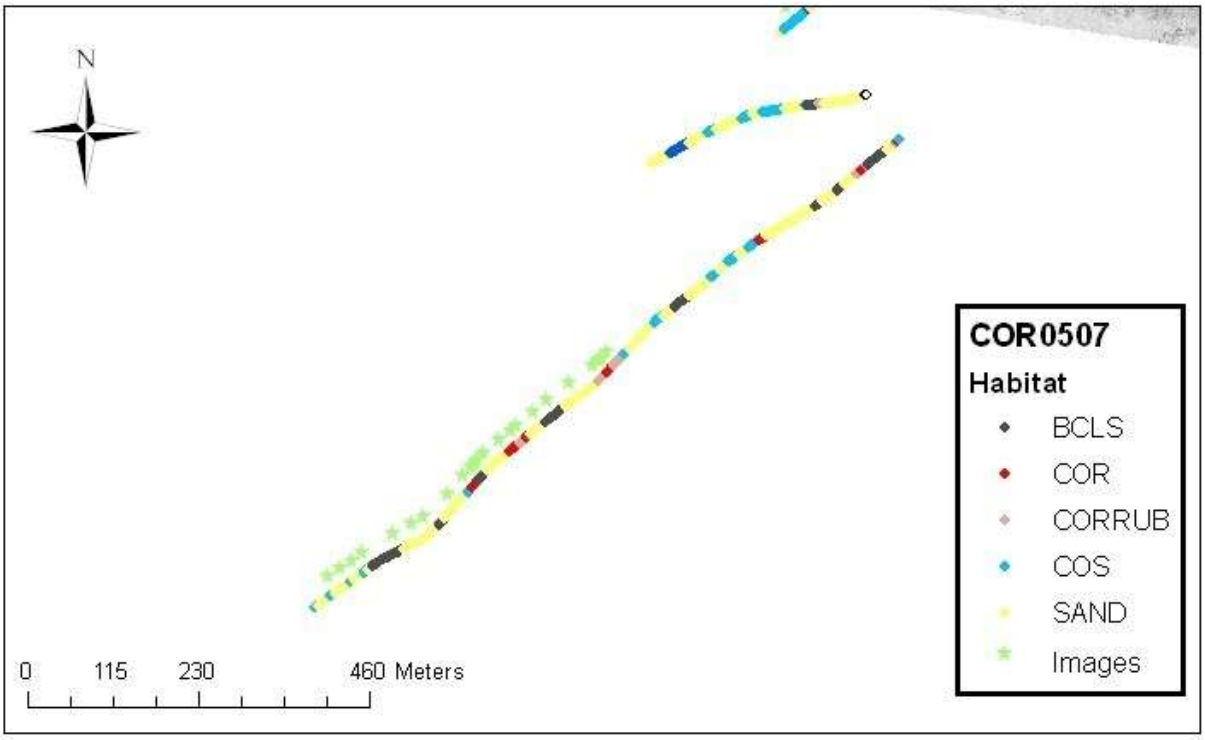
140
280 Meters
COR0504
Habitat
PACOS
SAND
Images





Sidescan sonar data obtained from the Department of Trade and Industry Strategic Environmental Assessment 7, 2005. (© BERR).



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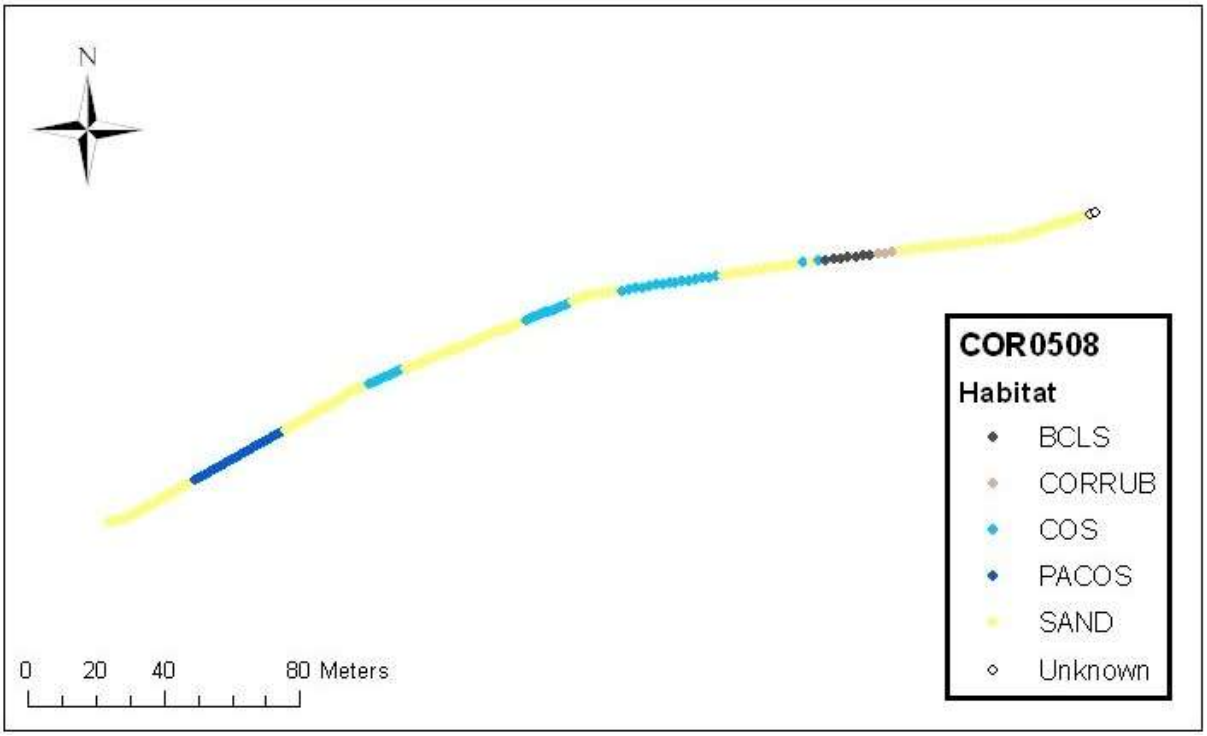

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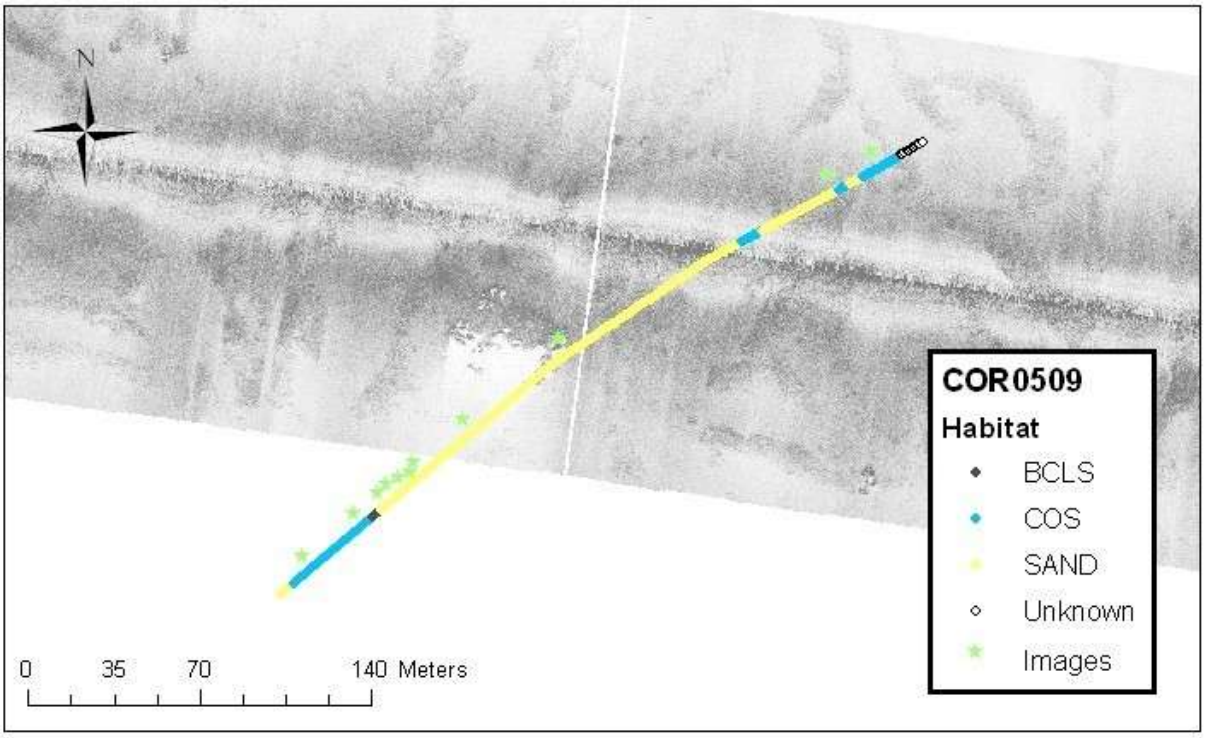

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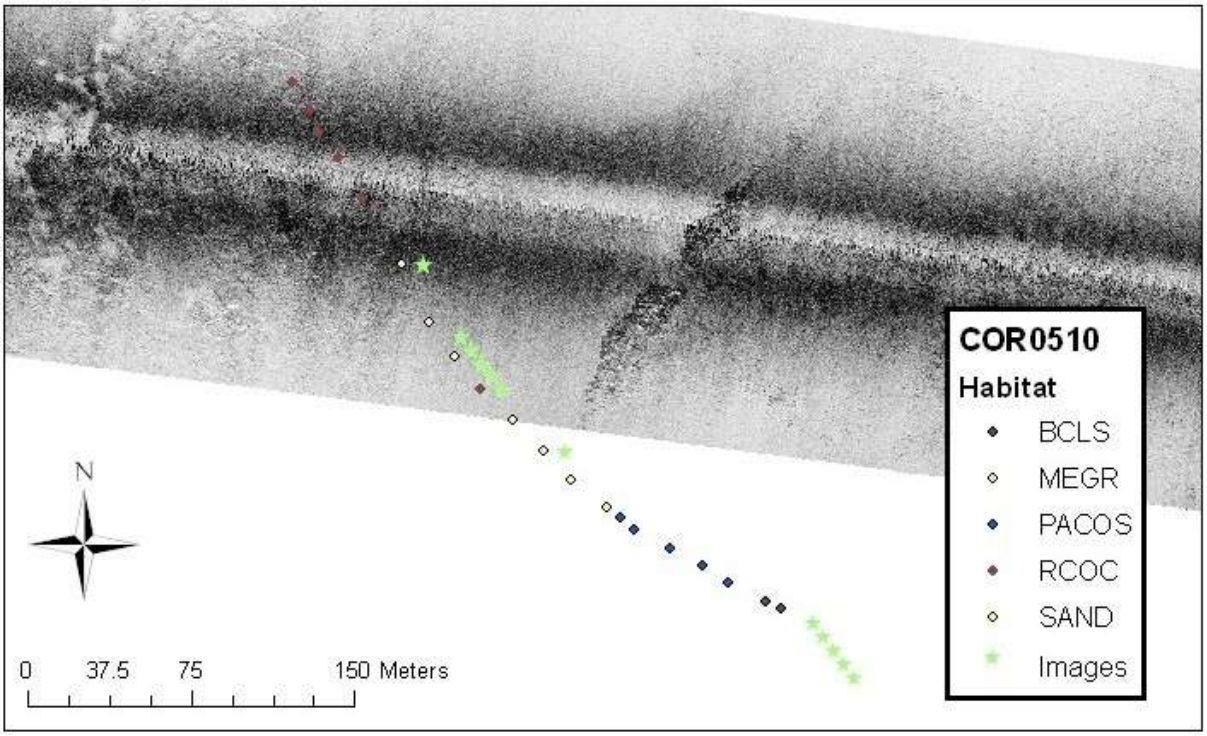

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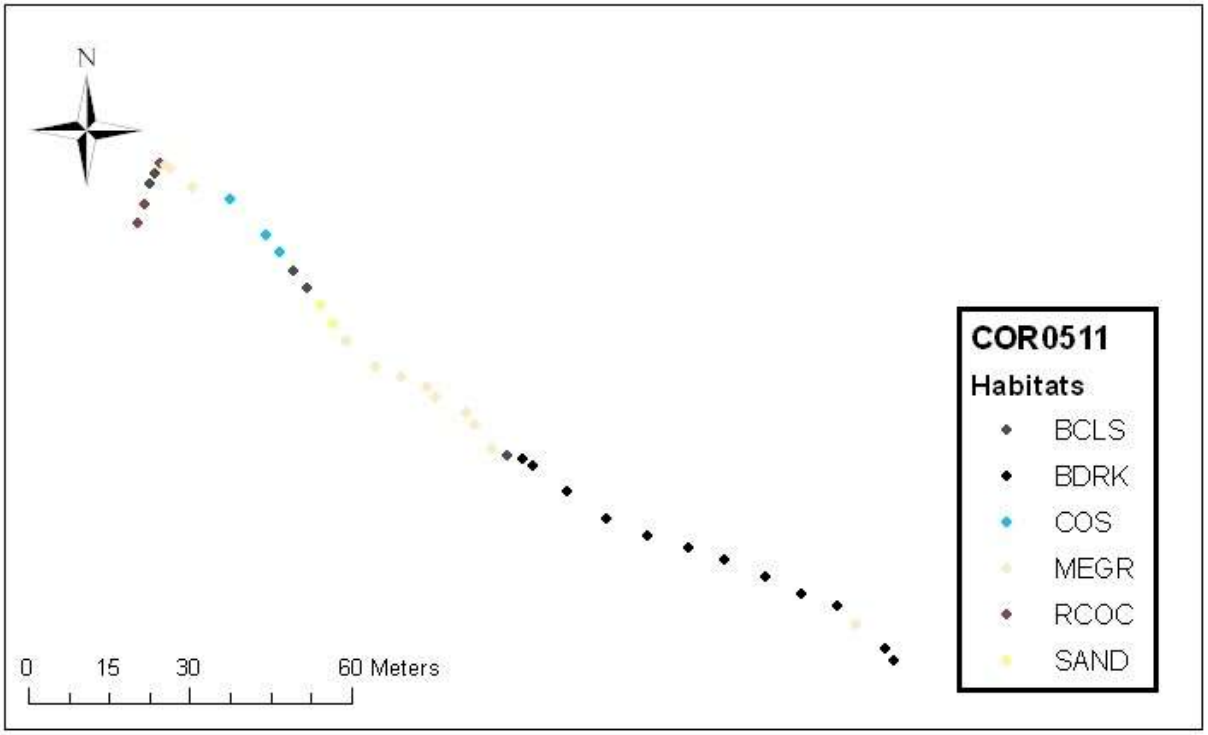
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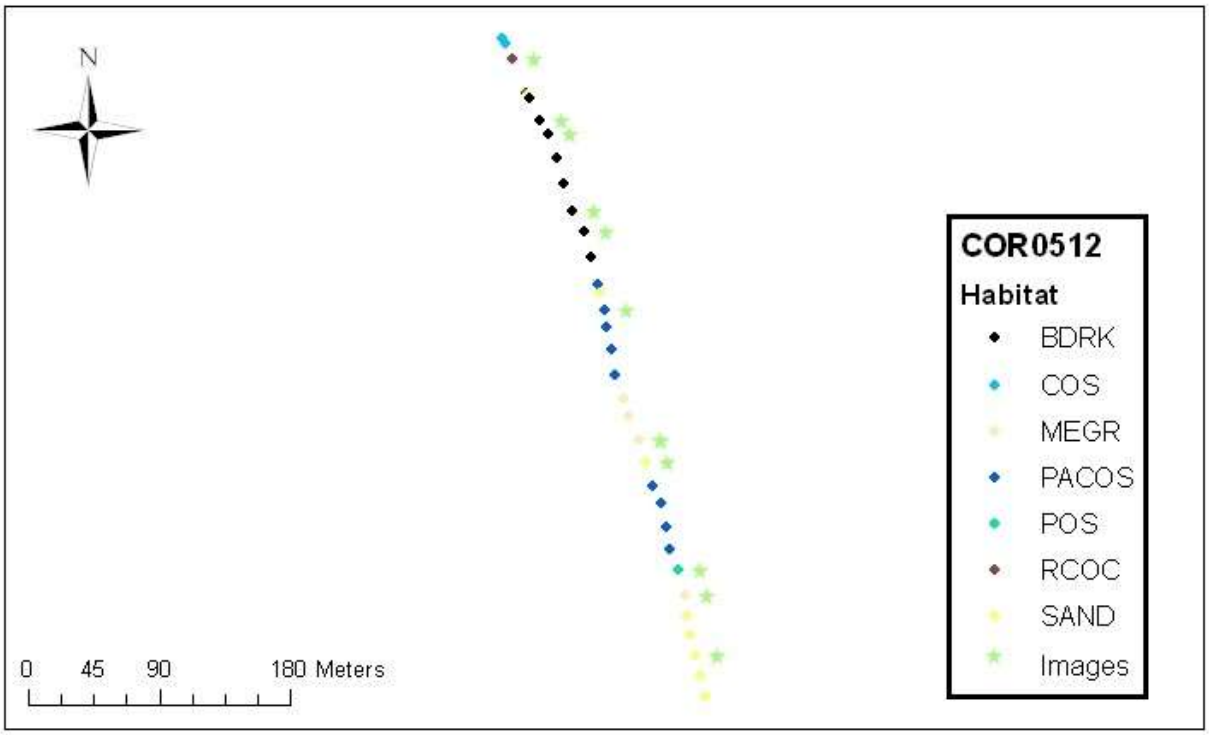
MEGR
RCOC
SAND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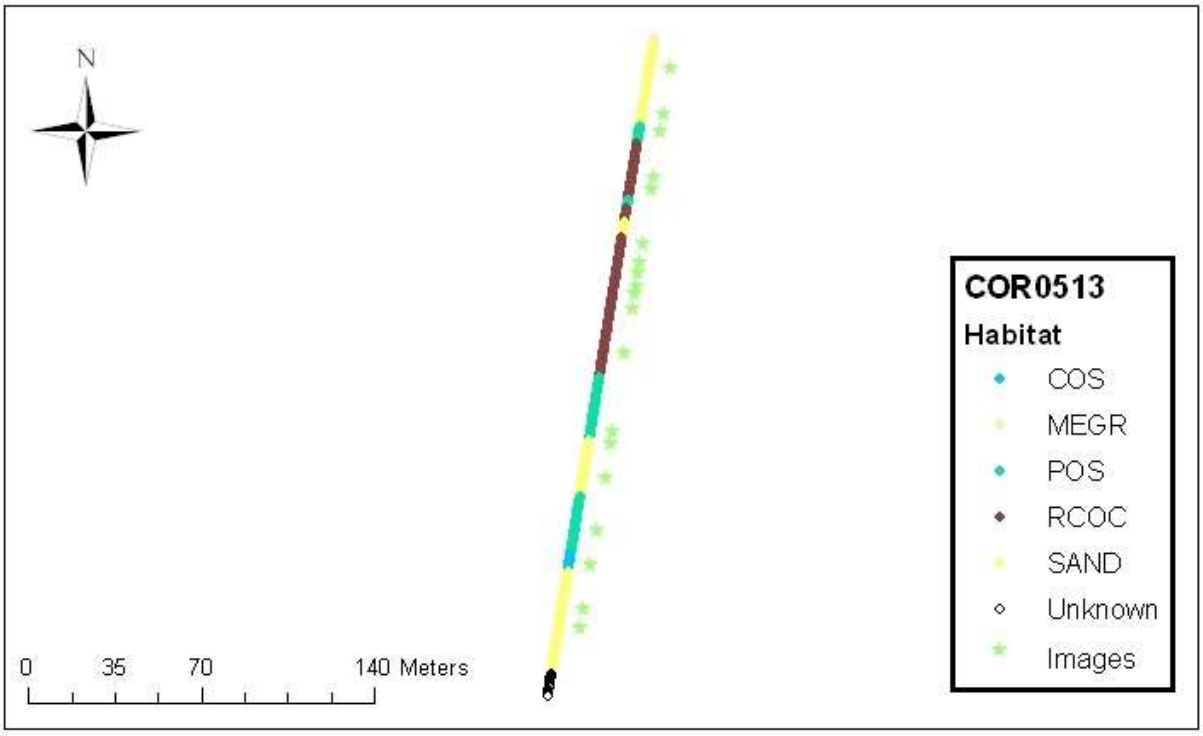
POS
RCOC
SAND
Images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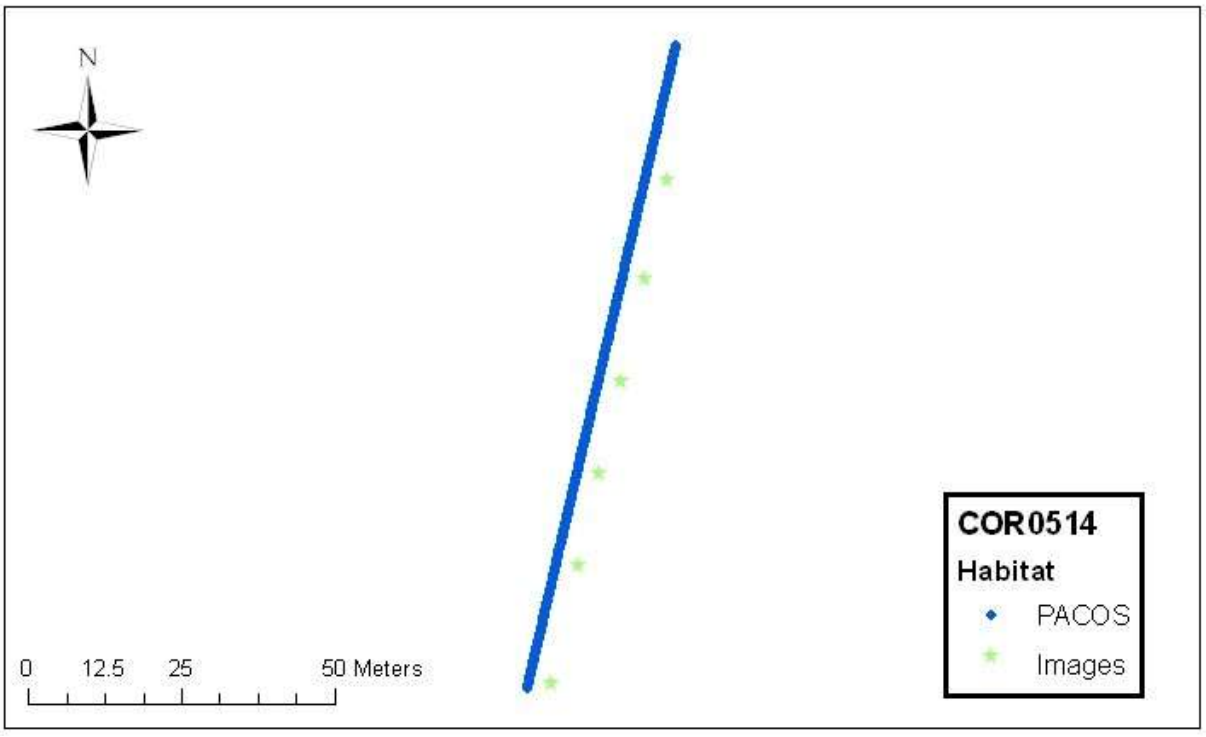
MEGR
POS
RCOC
SAND
Unknown
Images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25
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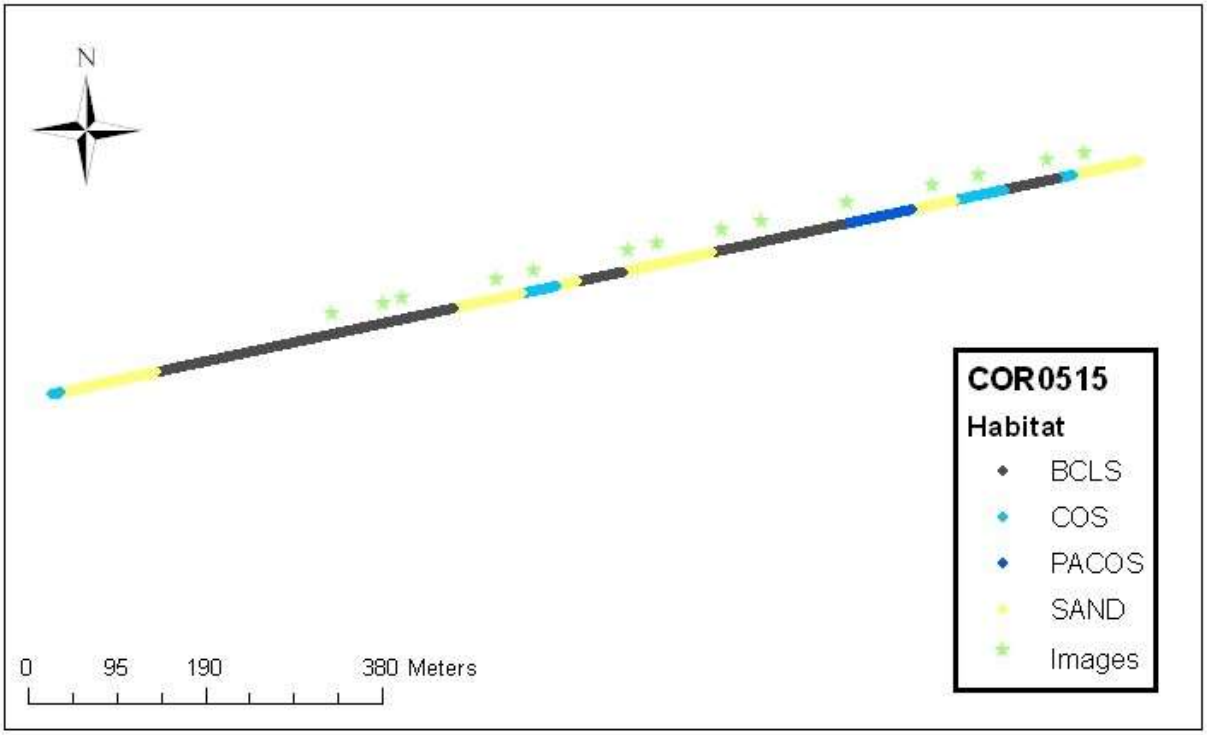
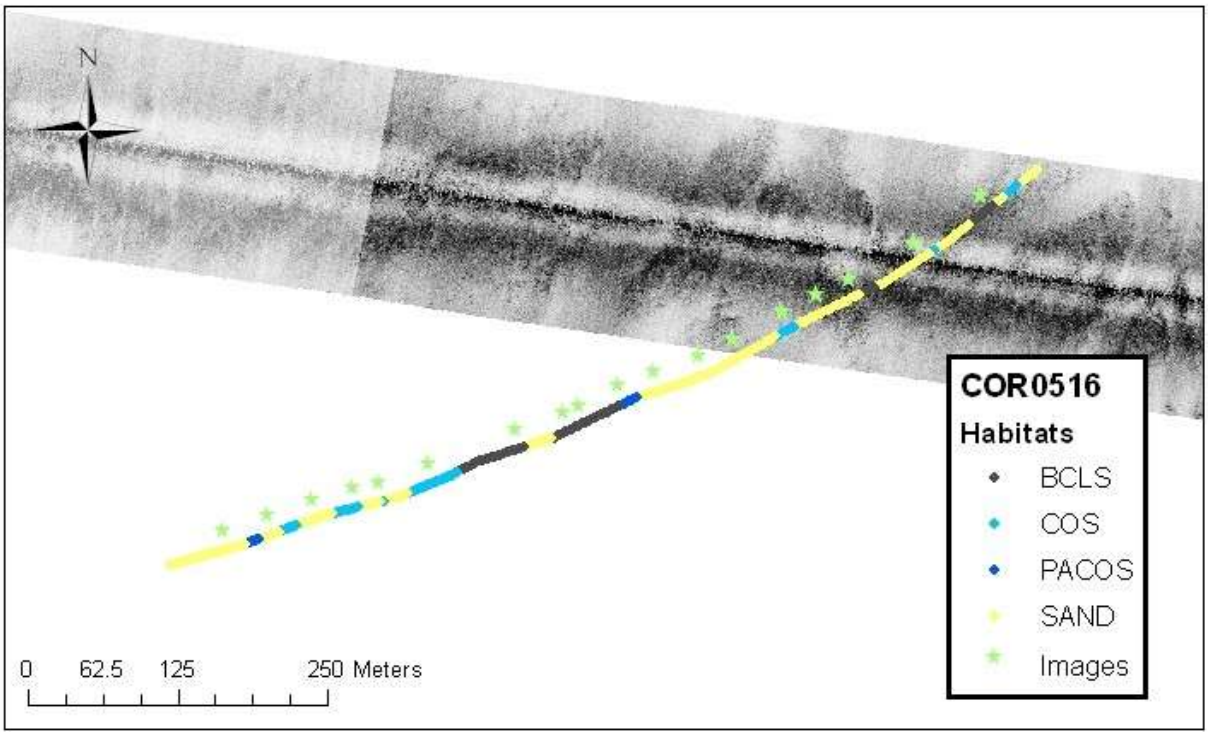
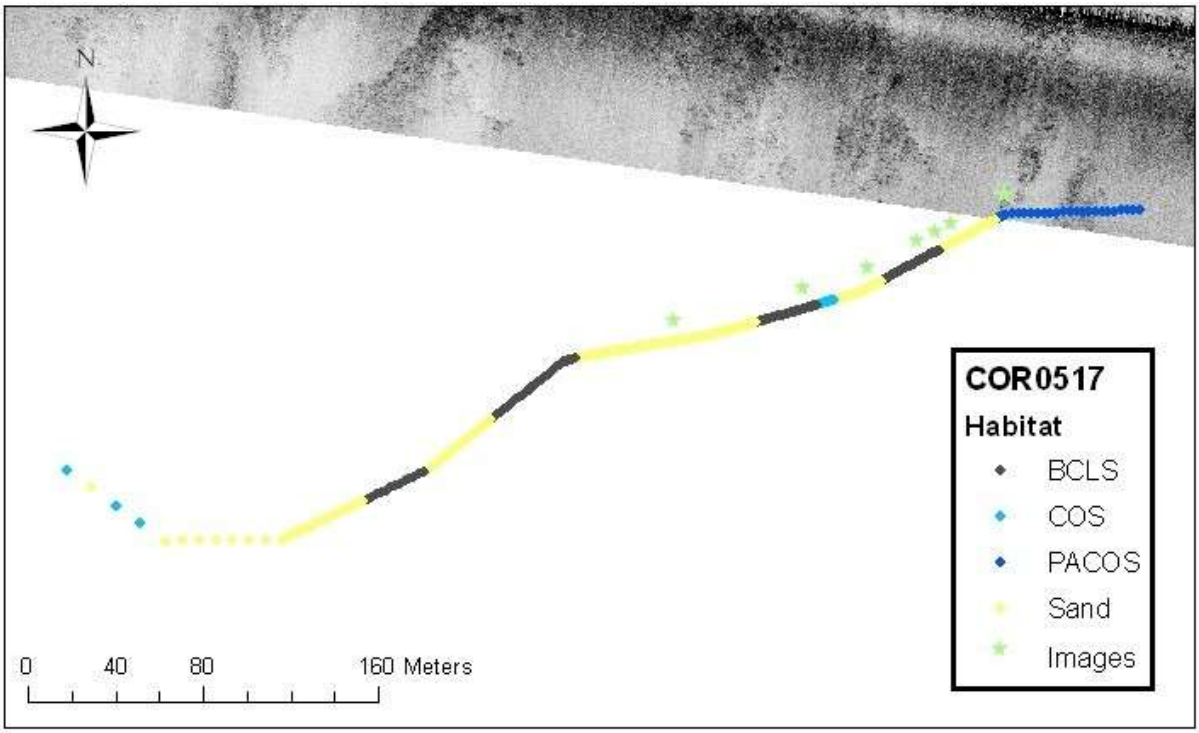
COR0514
Habitat
PACOS
Images

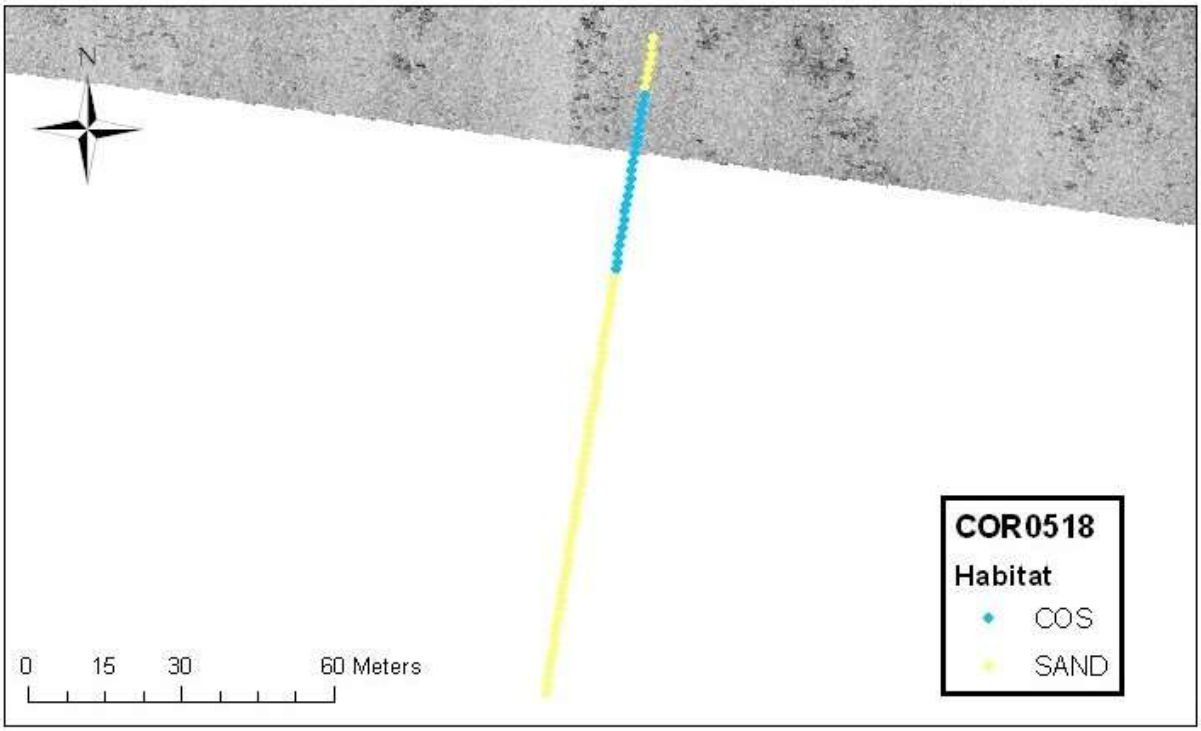




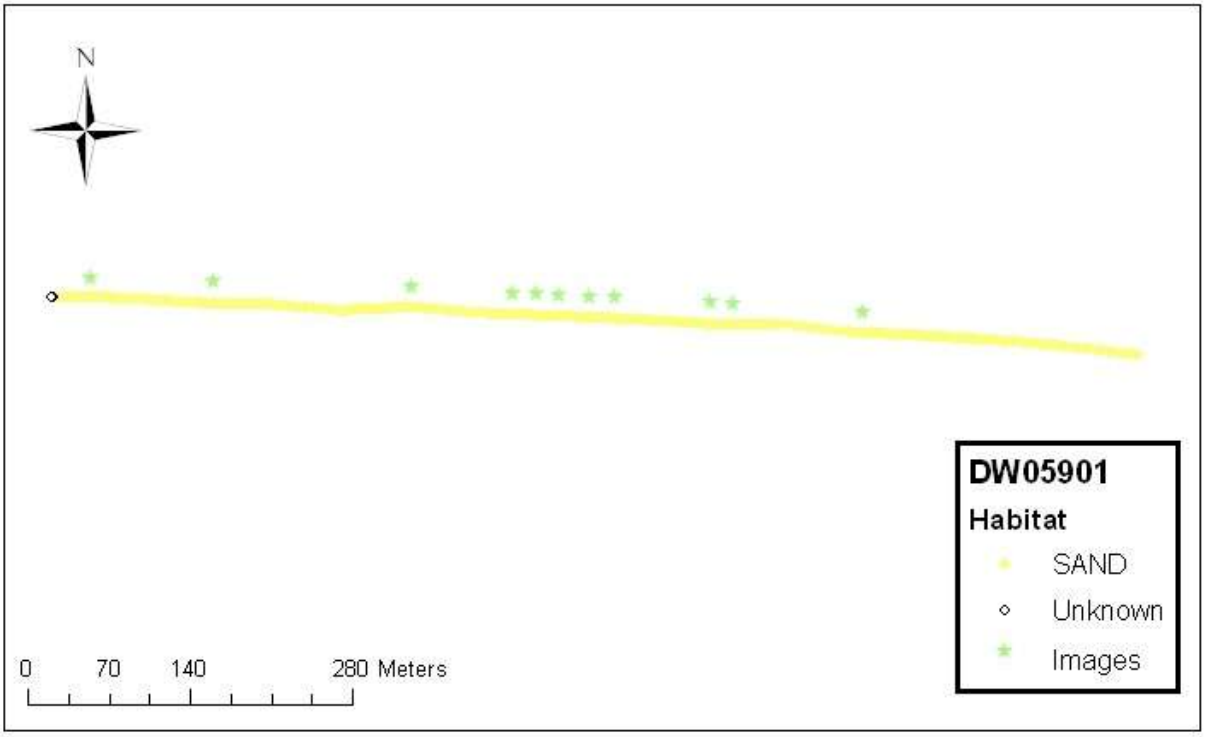
Sidescan sonar data obtained from the Department of Trade and Industry Strategic Environmental Assessment 7, 2005. (© BERR).

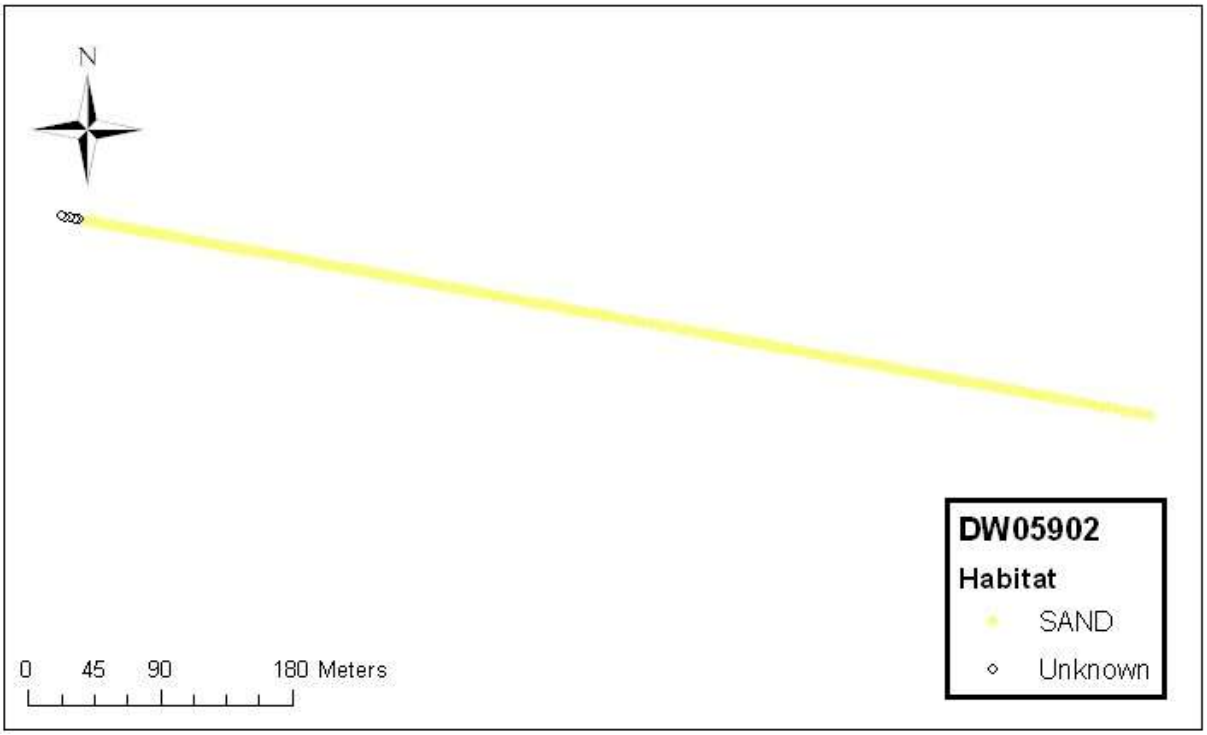


Sidescan sonar data obtained from the Department of Trade and Industry Strategic Environmental Assessment 7, 2005. (© BERR).



Sidescan sonar data obtained from the Department of Trade and Industry Strategic Environmental Assessment 7, 2005. (© BERR).


N
0
70
140
280 Meters
DW05901
Habitat
SAND
Unknown
Images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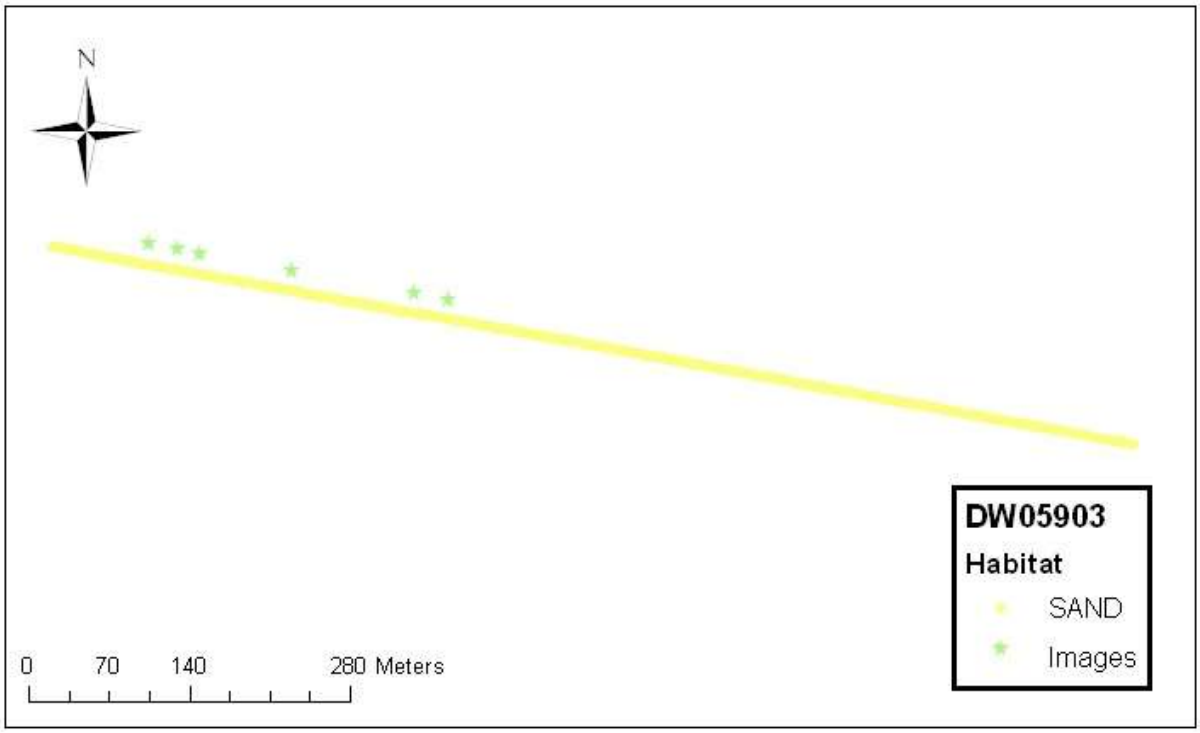
45
90
180 Meters
DW05902
Habitat
SAND
Unknown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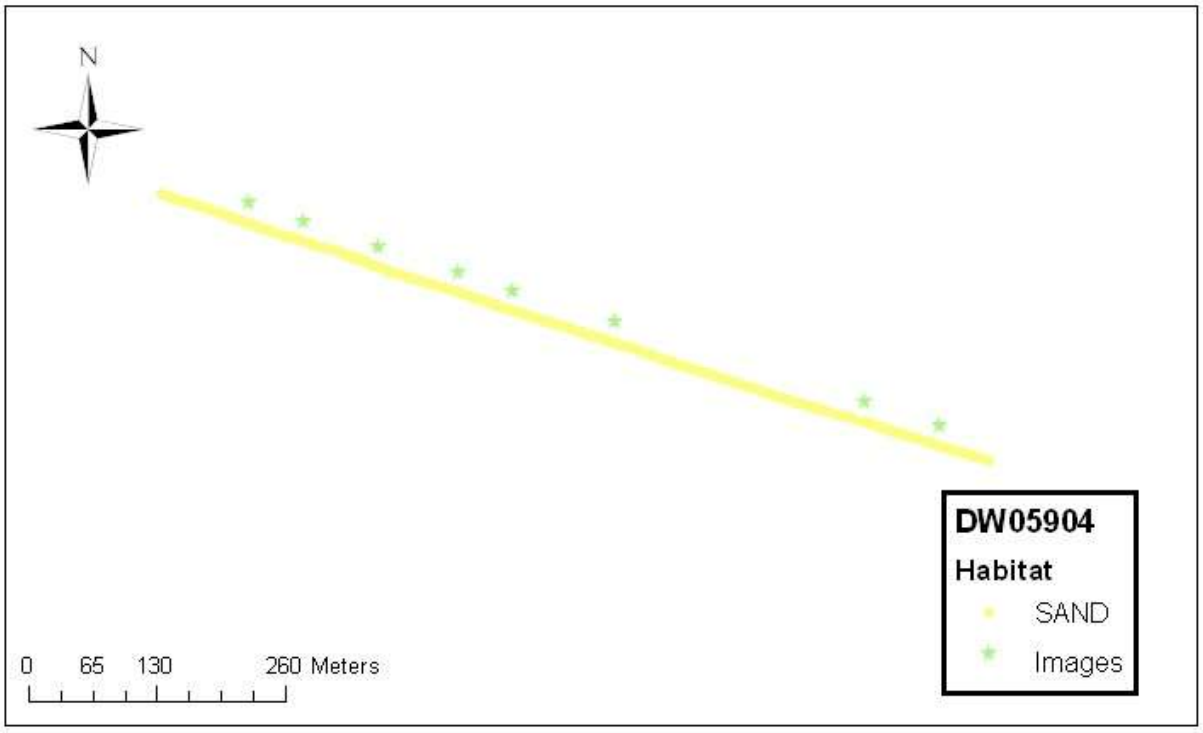
0
70
140
280 Meters
DW05903
Habitat
SAND
Images


N
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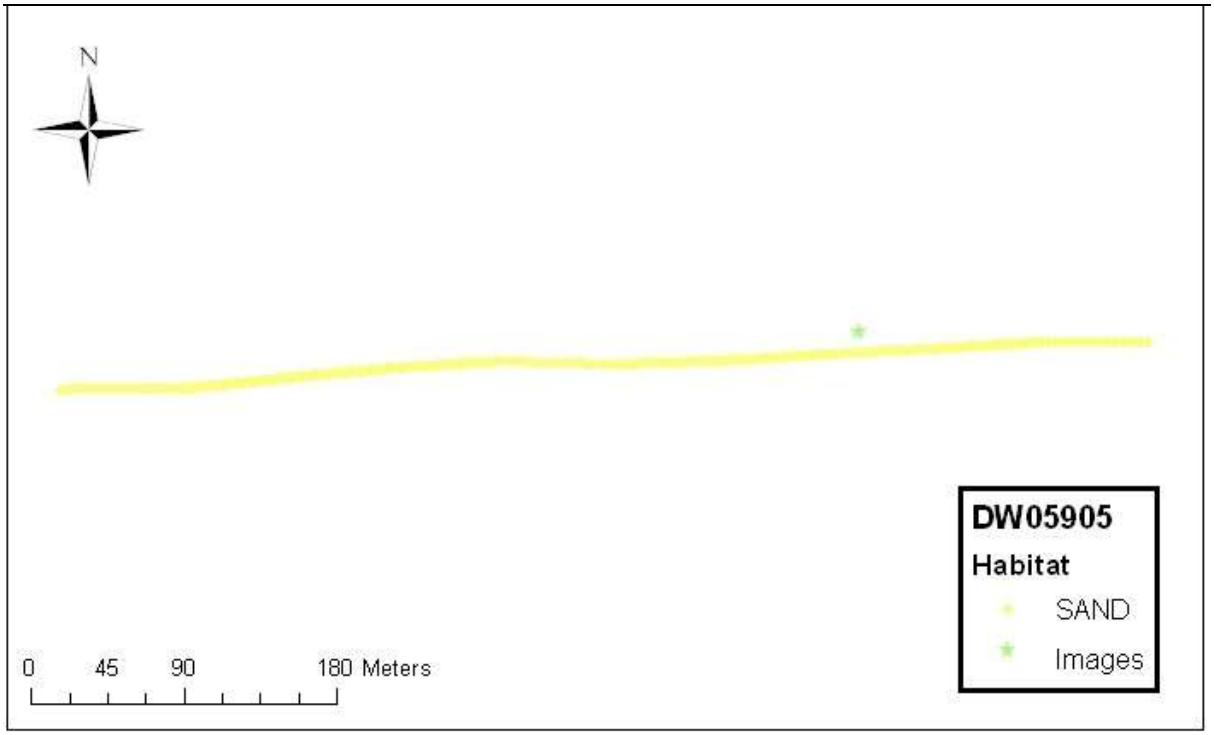
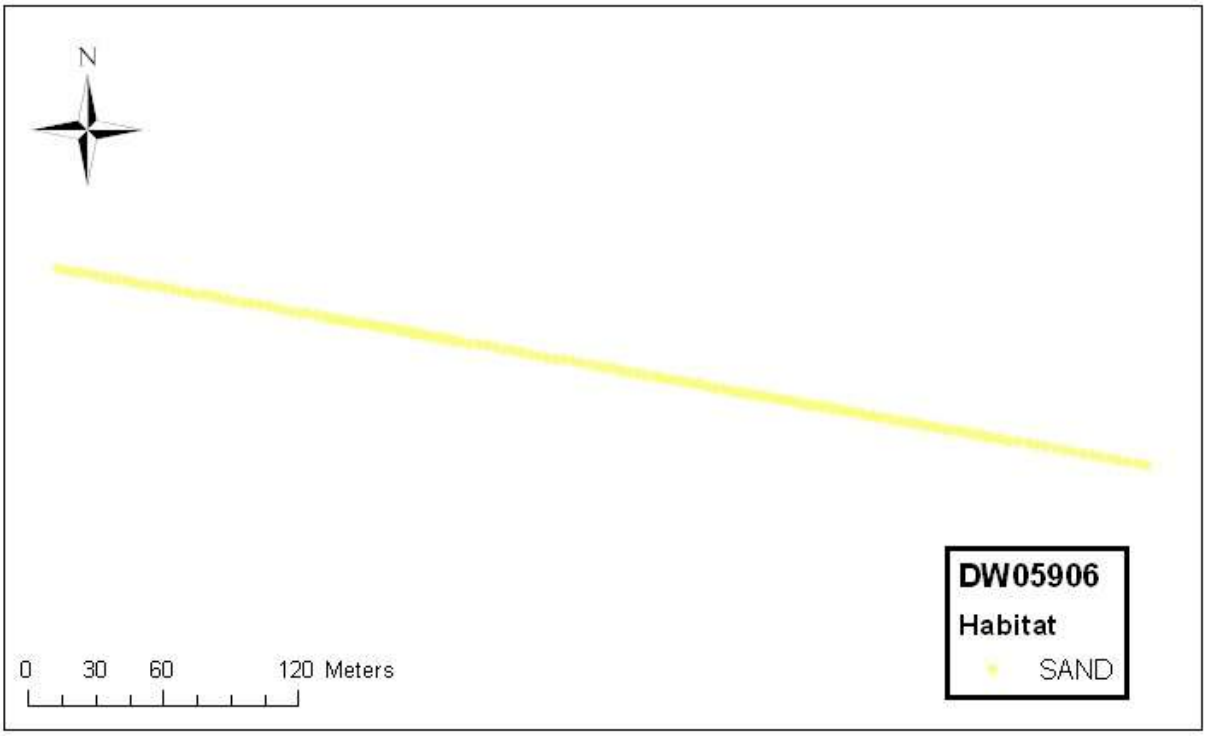
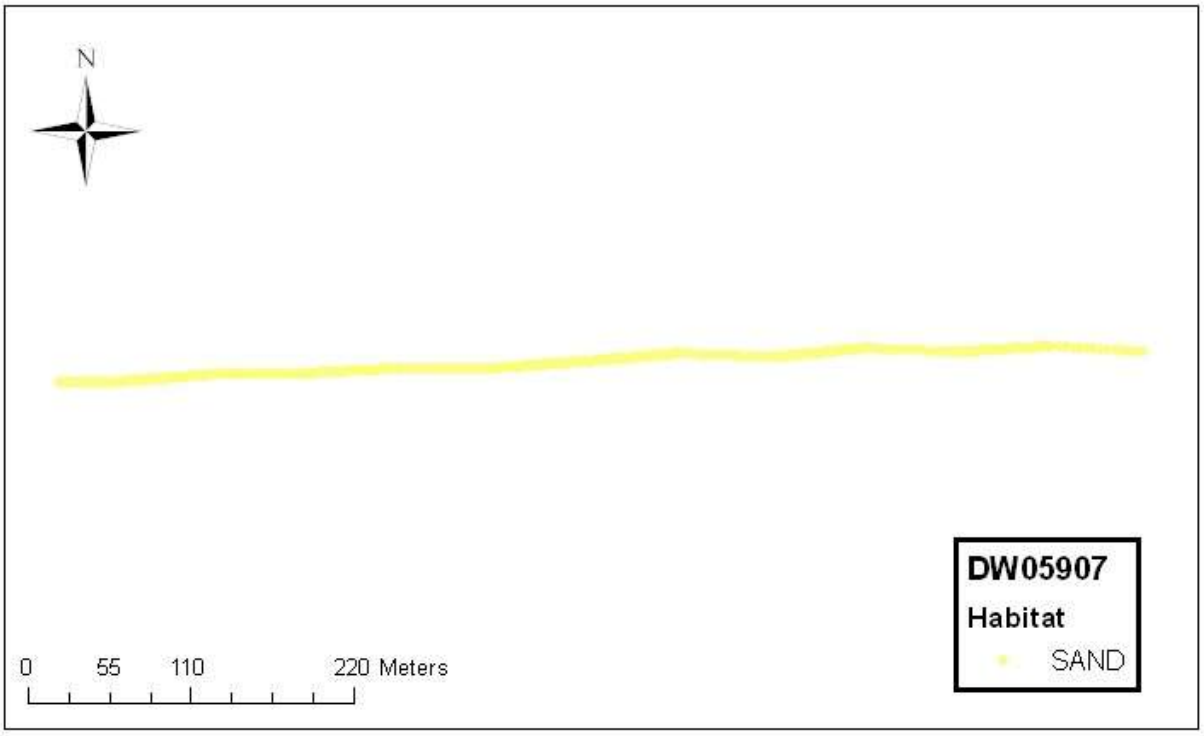
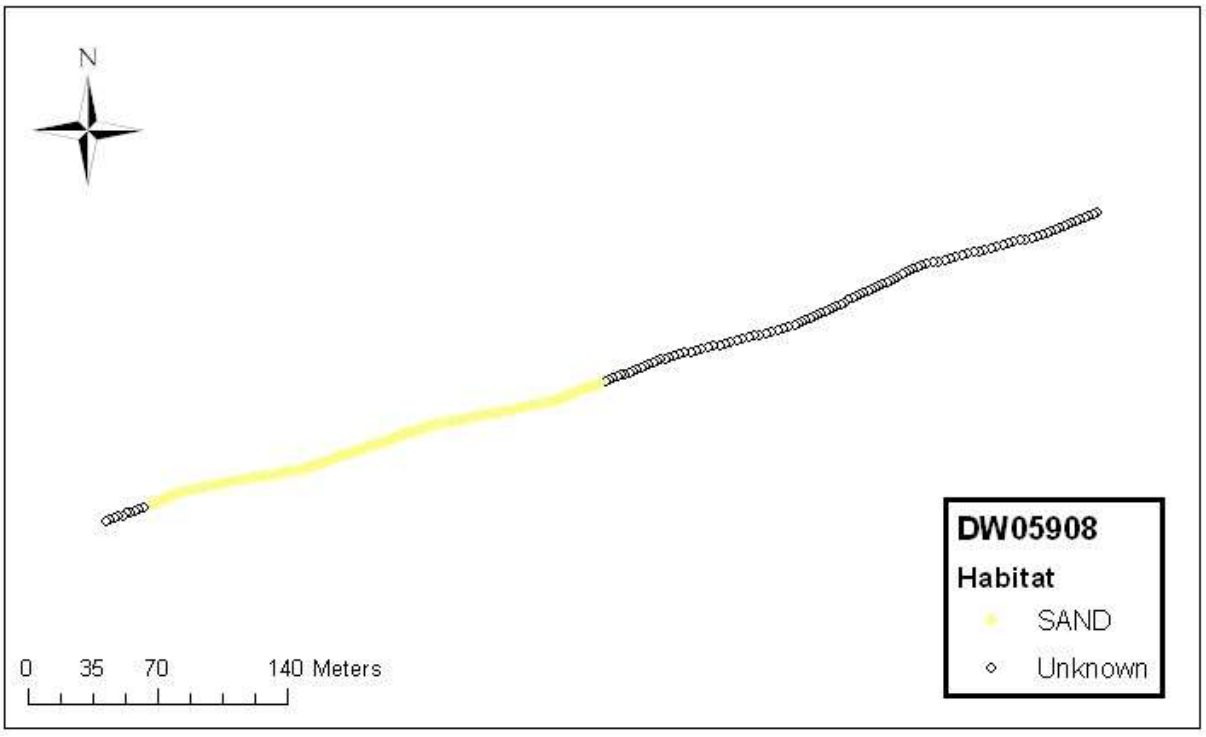
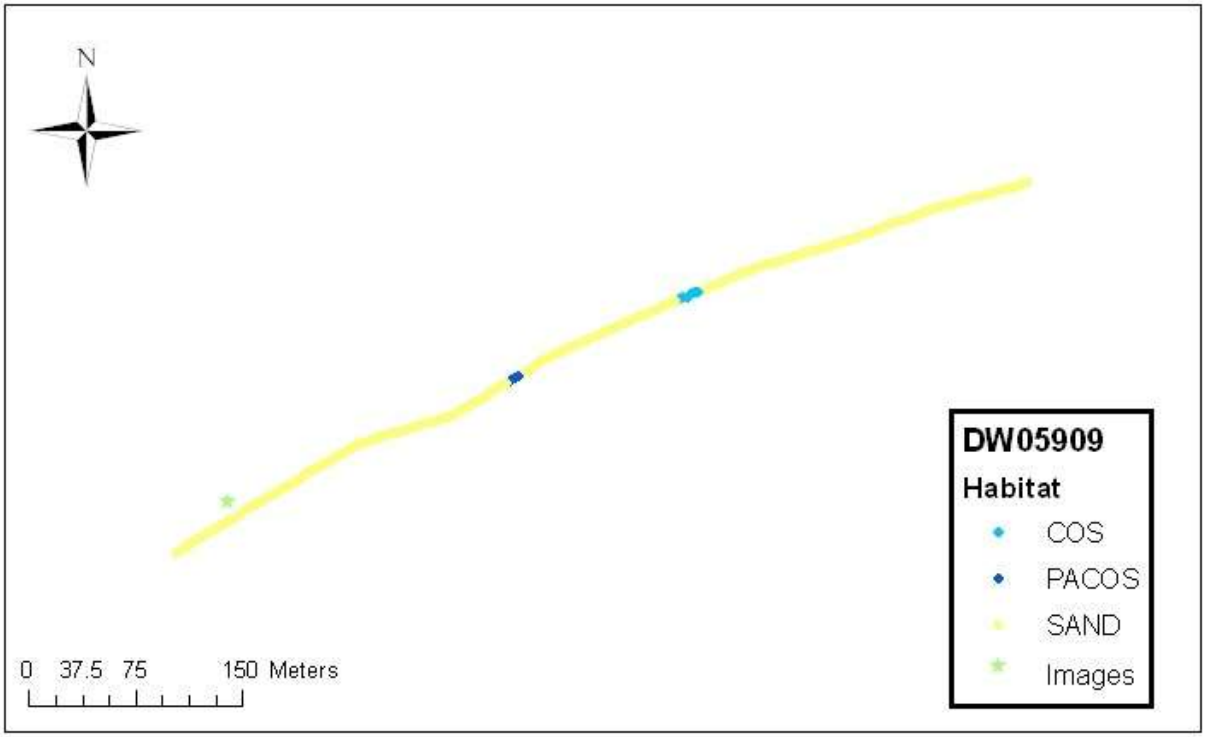
65
130
260 Meters
DW05904
Habitat
SAND
Images

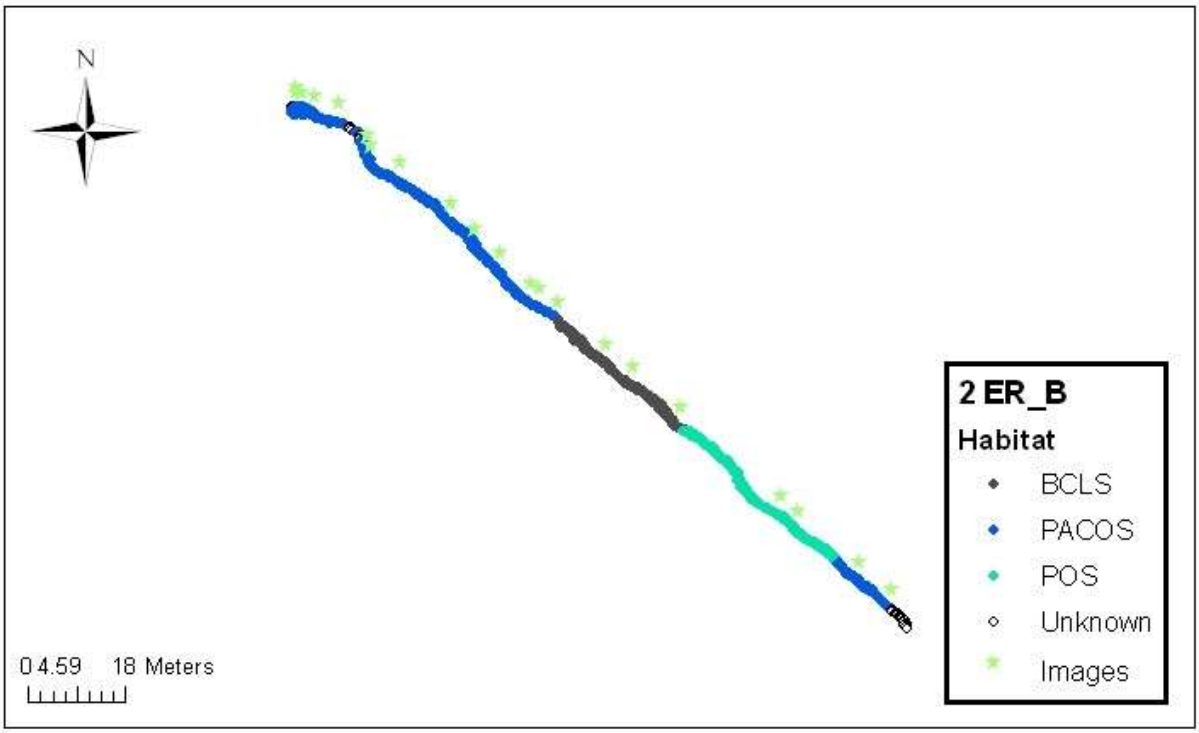

N
DW05905
Habitat
SAND
Images
0 45 90 180 Meters

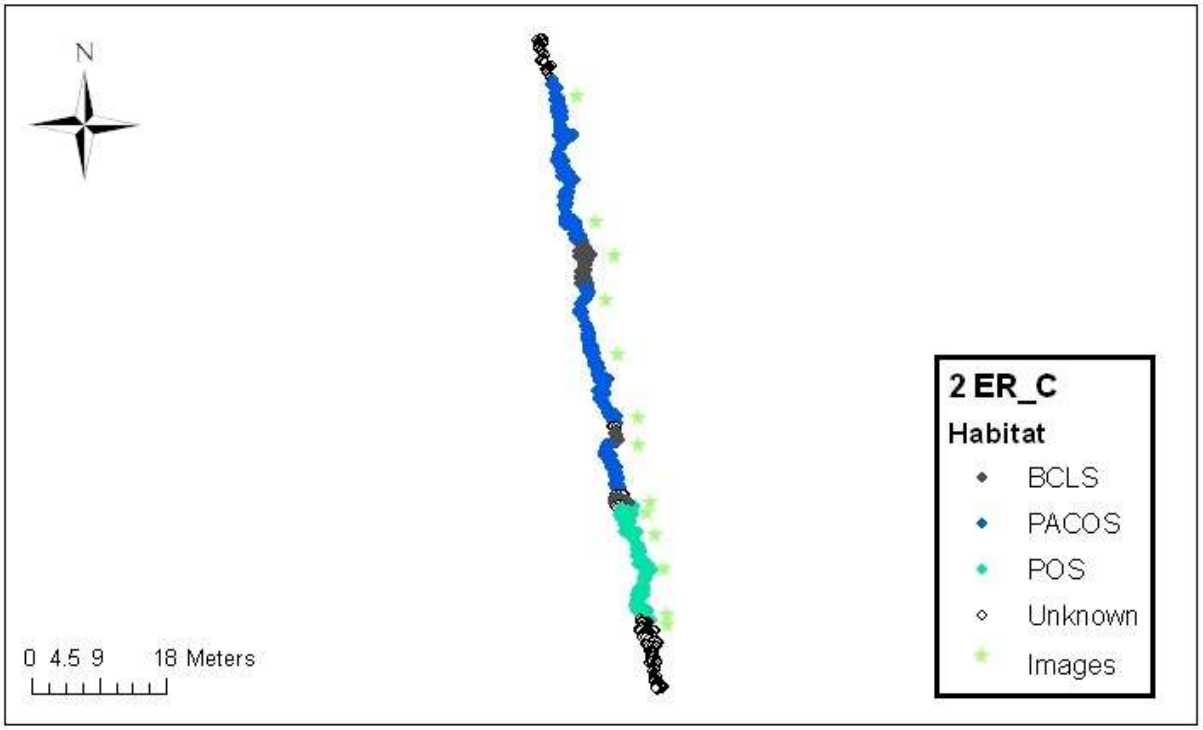

N
DW05906
Habitat
SAND
0 30 60 120 Meters

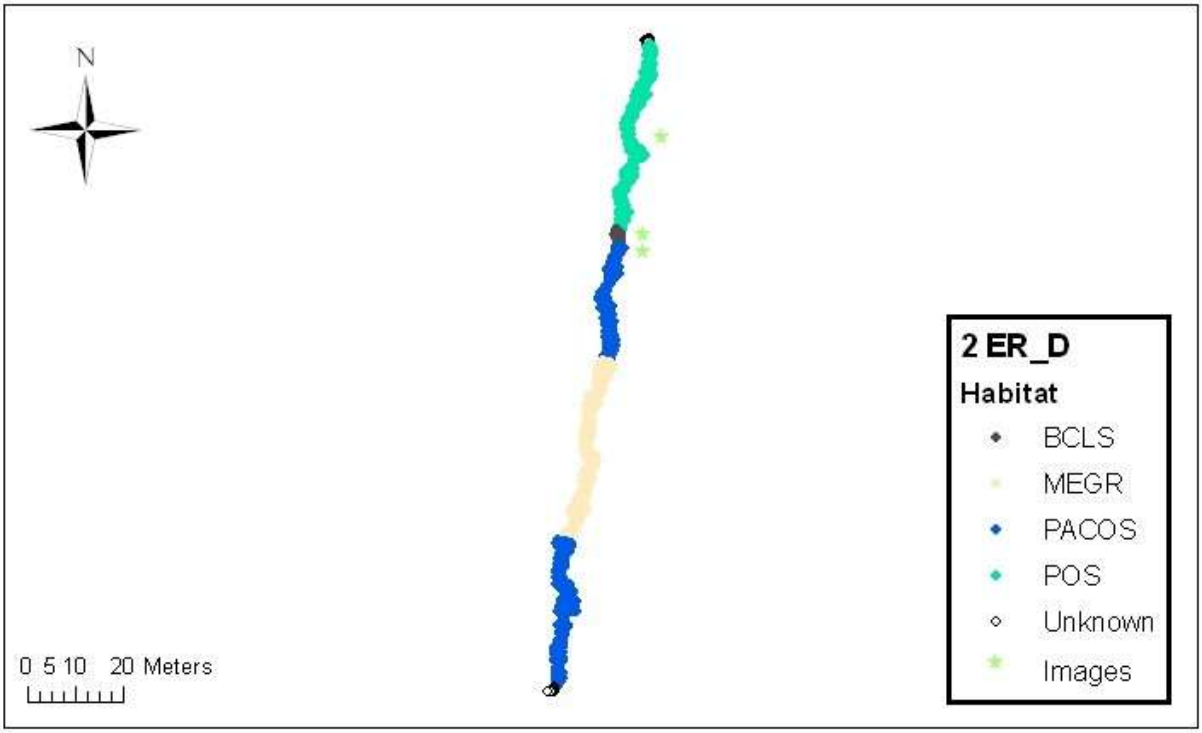

N
0
55
110
220 Meters
DW05907
Habitat
SAND

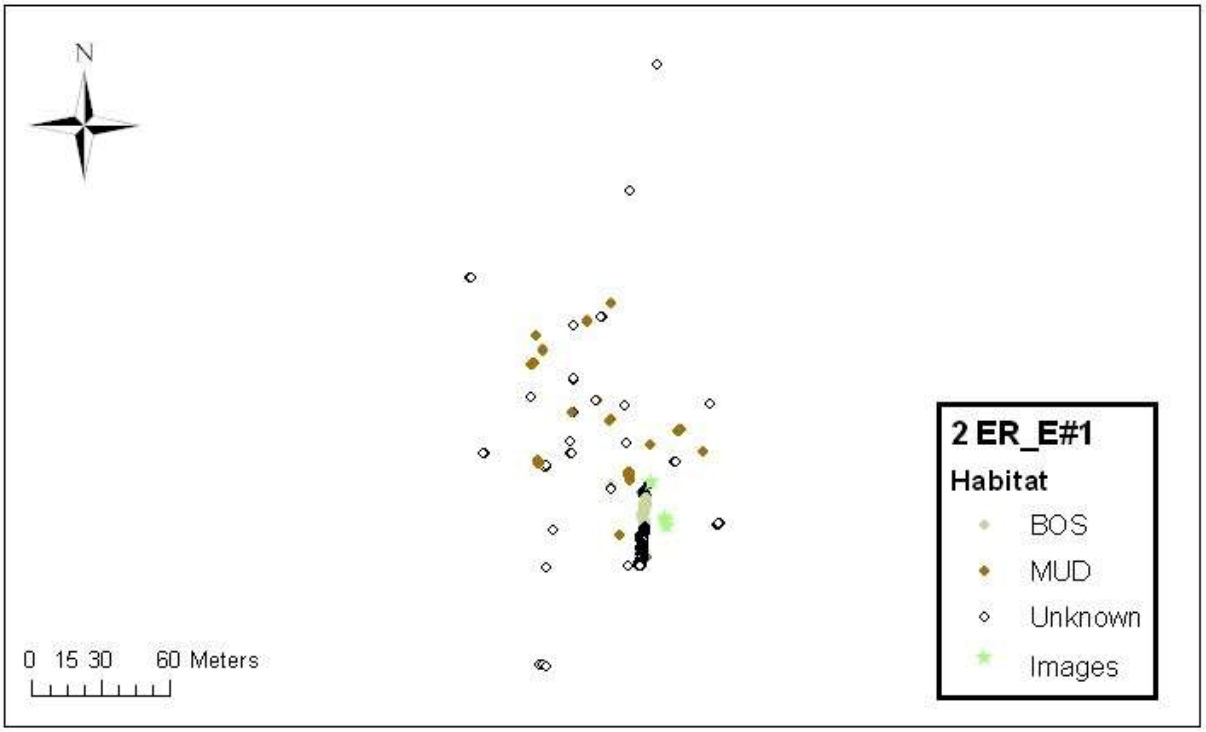

N
0
35
70
140 Meters
DW05908
Habitat
SAND
Unknown

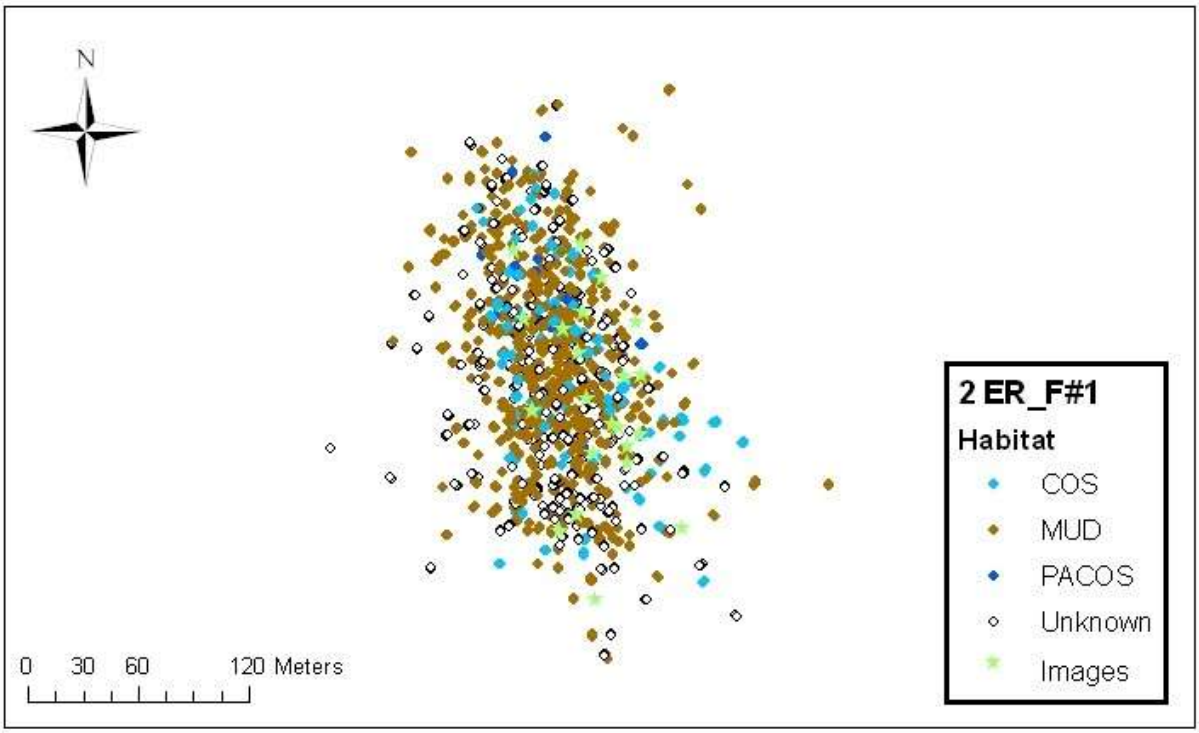

N
0 37.5 75 150 Meters
DW05909
Habitat
COS
PACOS
SAND
Images

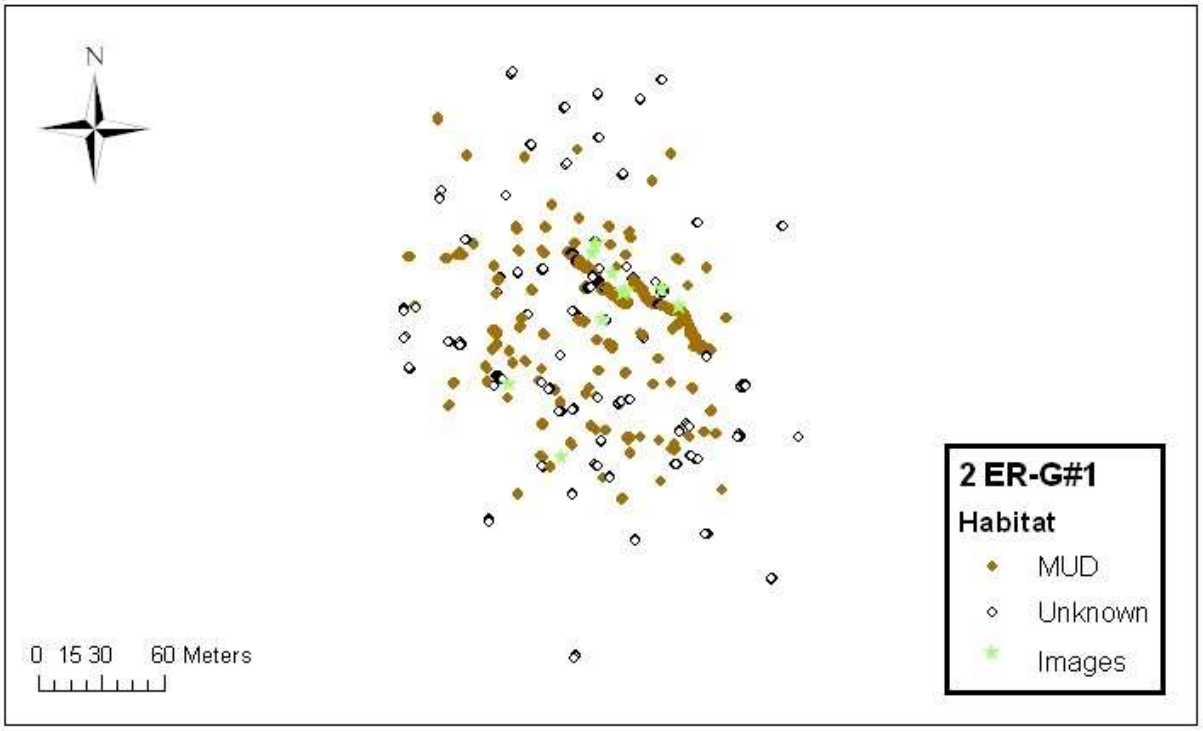

N
0 4.59 18 Meters
2 ER_B
Habitat
BCLS
PACOS
POS
Unknown
Images

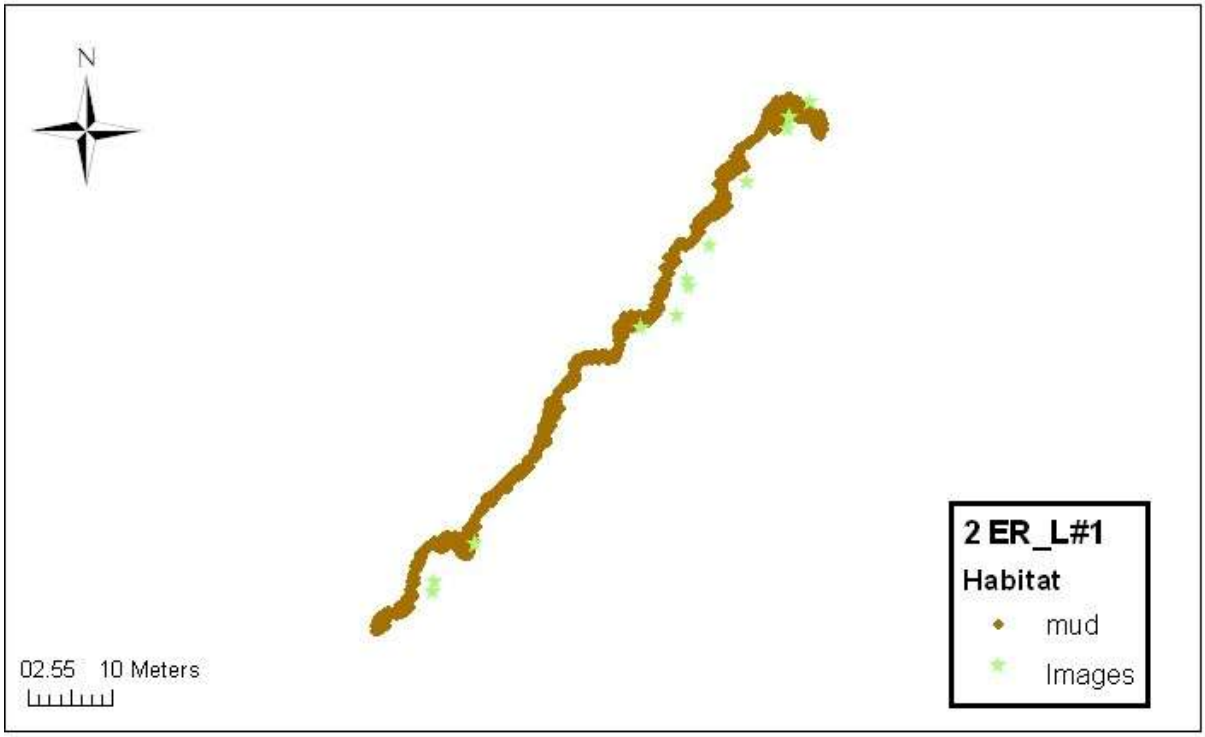

N
0 4.5 9 18 Meters
2 ER_C
Habitat
BCLS
PACOS
POS
Unknown
Images

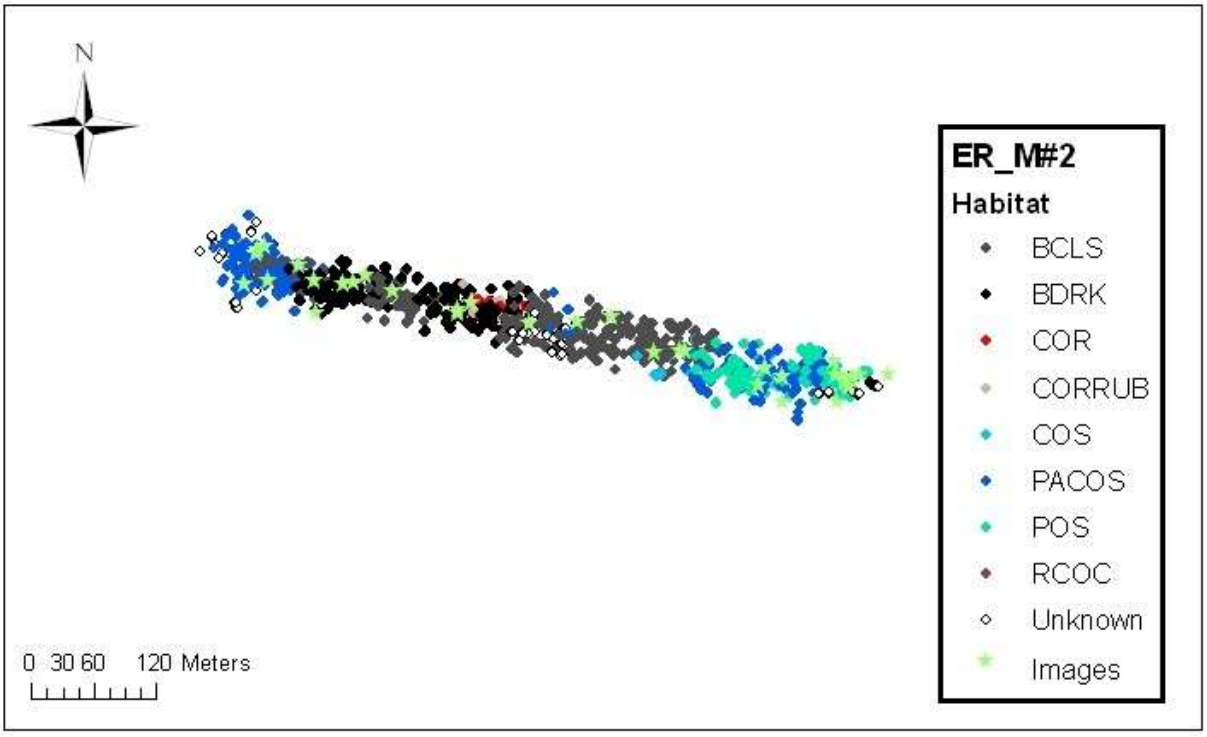

N
0 5 10 20 Meters
2 ER_D
Habitat
BCLS
MEGR
PACOS
POS
Unknown
Images

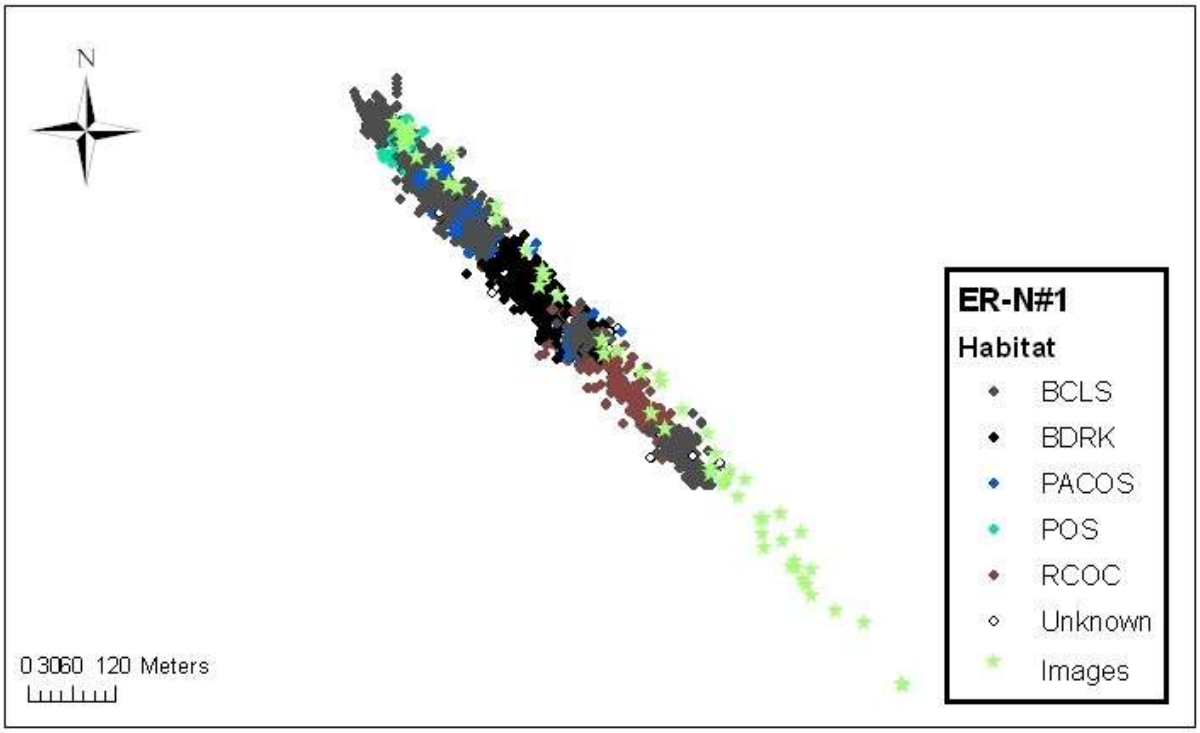

N
0 15 30 60 Meters
2 ER_E#1
Habitat
BOS
MUD
Unknown
Images

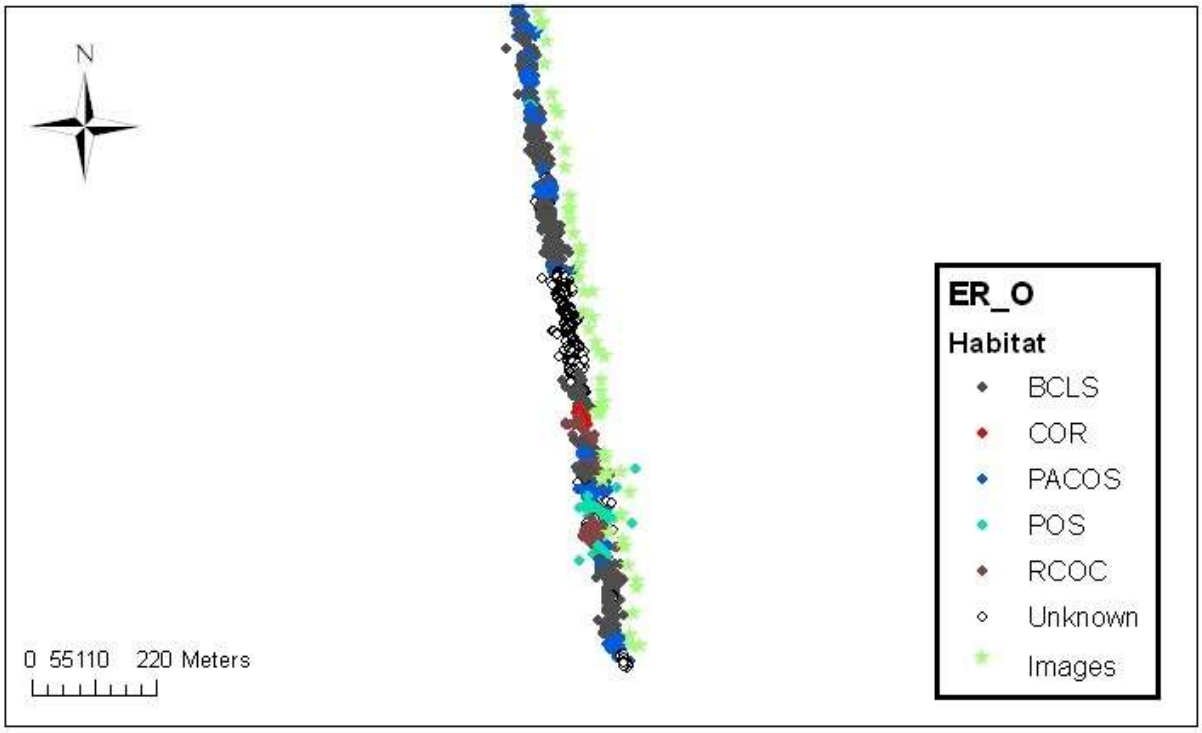

N
0 30 60 120 Meters
2 ER_F#1
Habitat
COS
MUD
PACOS
Unknown
Images

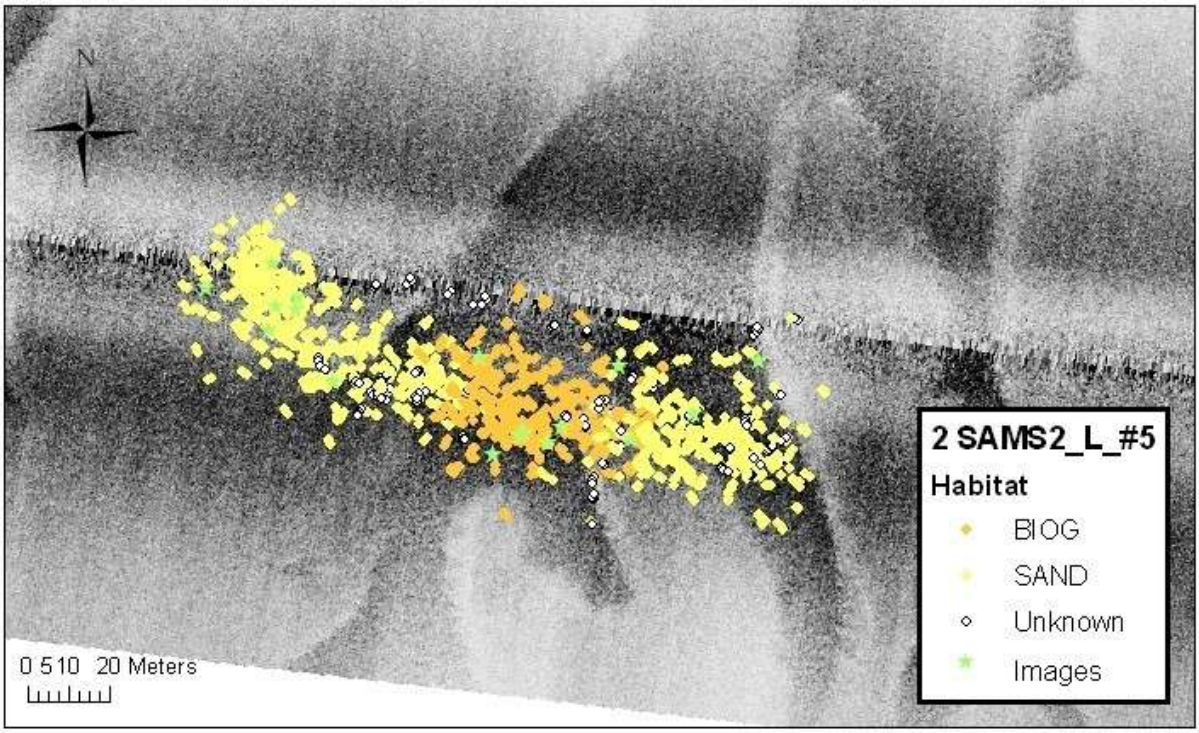

N
0 15 30 60 Meters
2 ER-G#1
Habitat
MUD
Unknown
Images


N
02.55 10 Meters
2 ER_L#1
Habitat
mud
Images

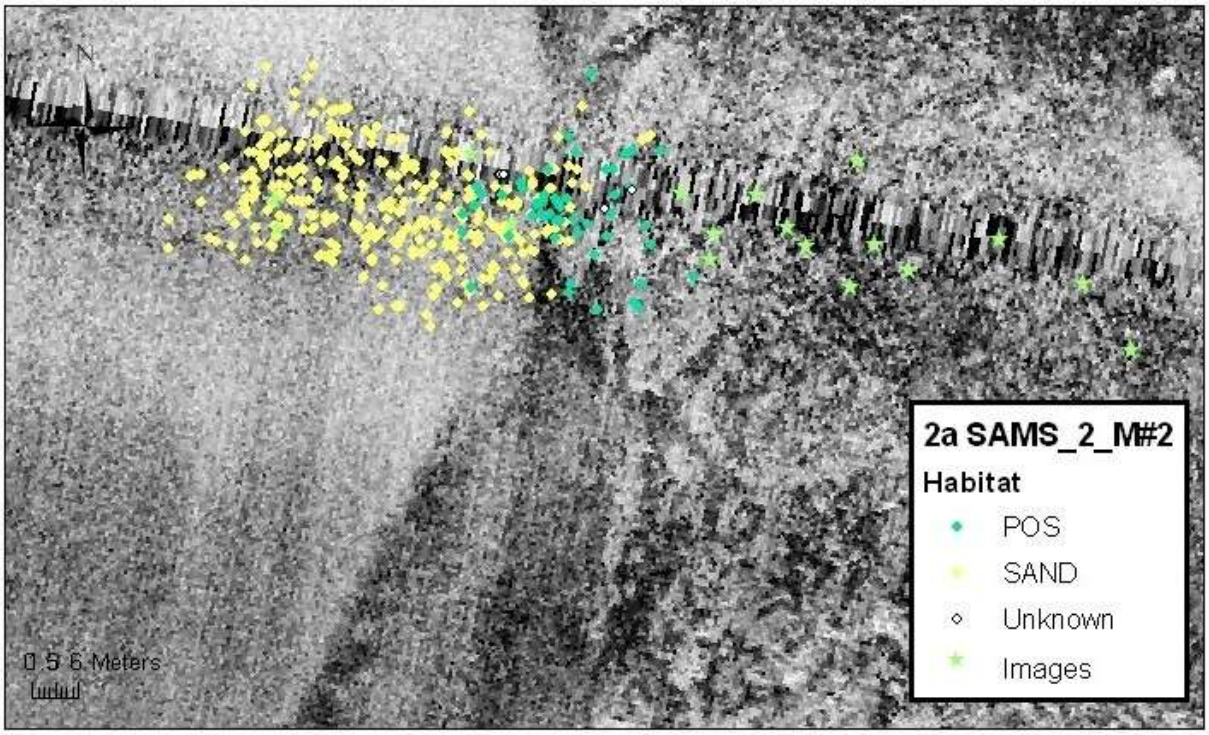

N
0 30 60 120 Meters
ER_M#2
Habitat
BCLS
BDRK
COR
CORRUB
COS
PACOS
POS
RCOC
Unknown
Images


N
0 3060 120 Meters
ER-N#1
Habitat
BCLS
BDRK
PACOS
POS
RCOC
Unknown
Images

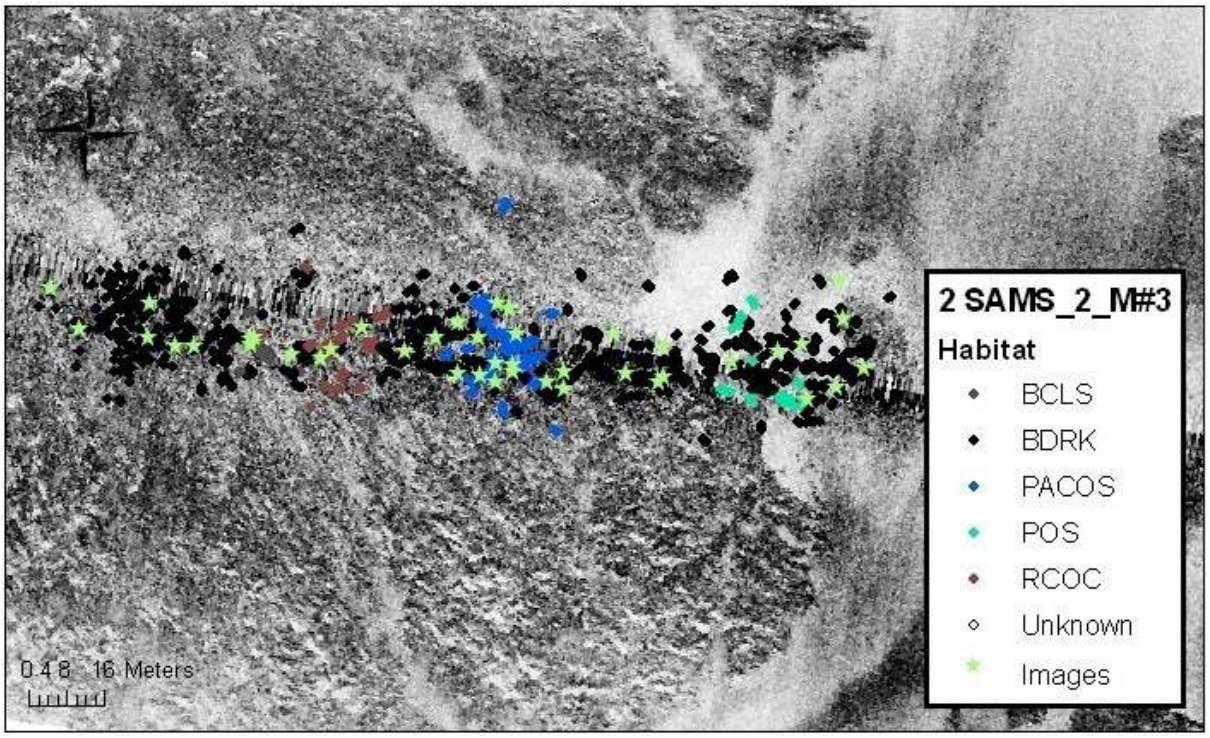

N
0 55110 220 Meters
ER_O
Habitat
BCLS
COR
PACOS
POS
RCOC
Unknown
Images



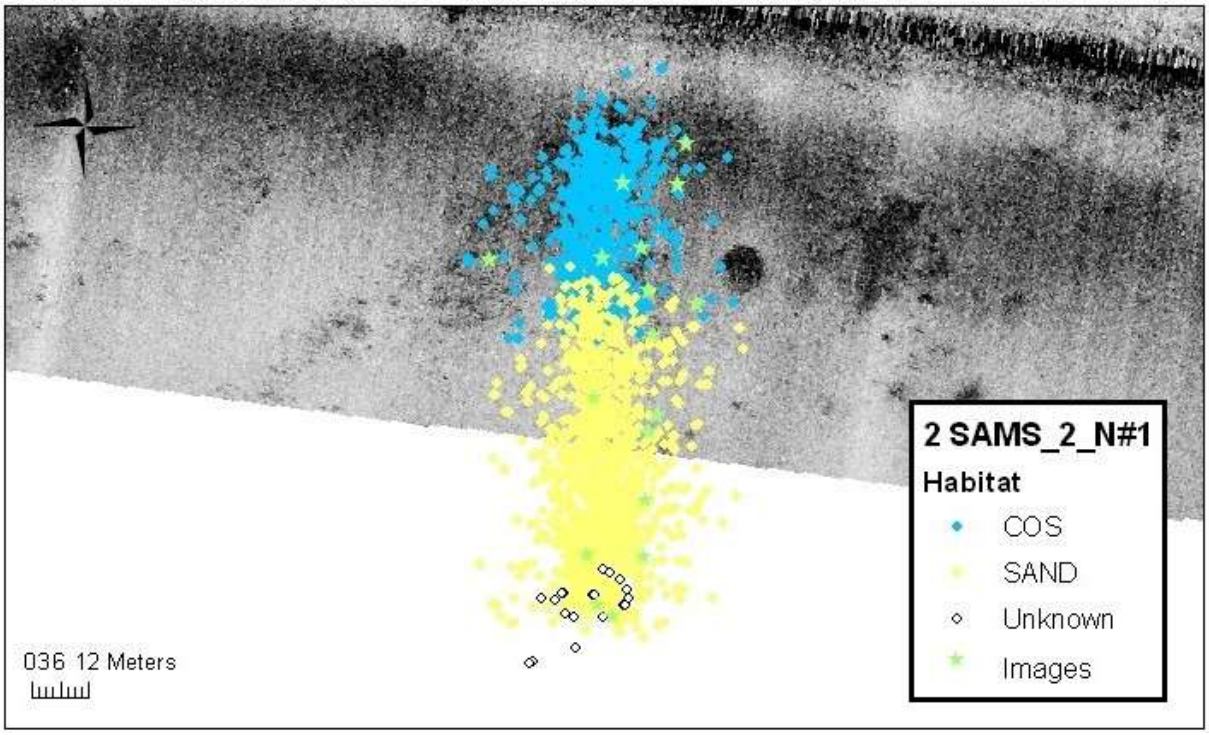
Sidescan sonar data obtained from the Department of Trade and Industry Strategic Environmental Assessment 7, 2005. (© BERR).



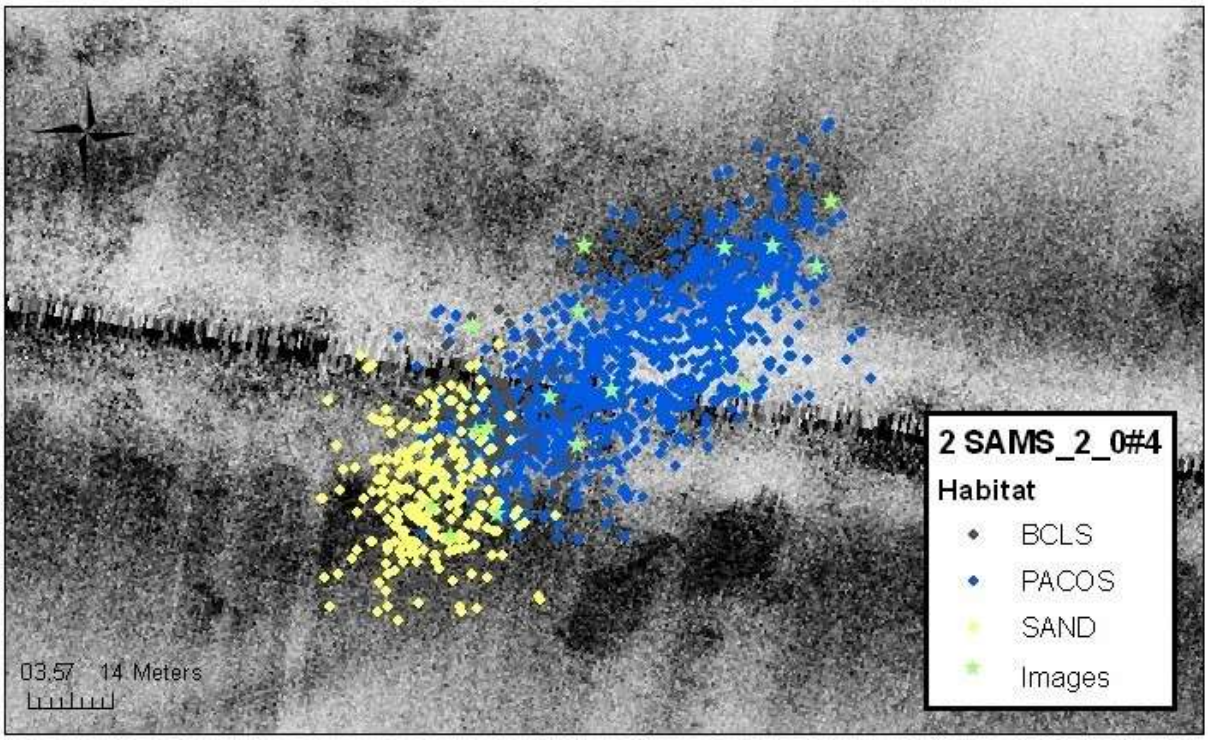
Sidescan sonar data obtained from the Department of Trade and Industry Strategic Environmental Assessment 7, 2005. (© BERR).



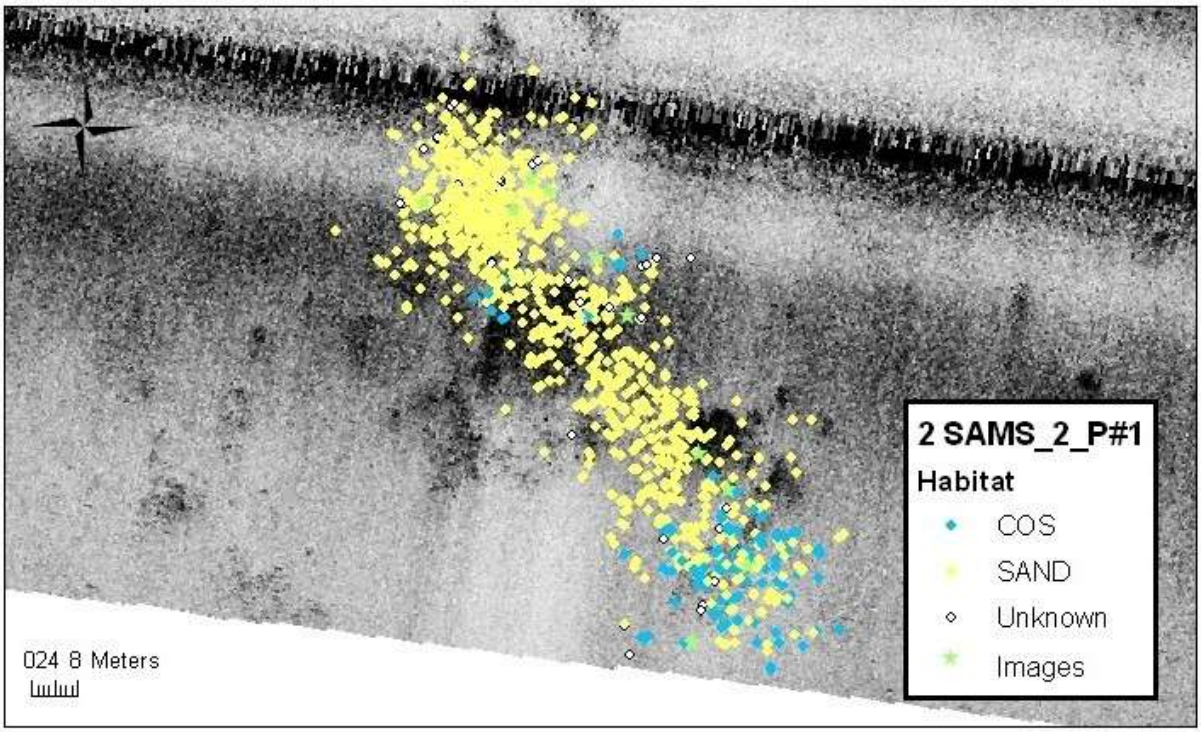
Sidescan sonar data obtained from the Department of Trade and Industry Strategic Environmental Assessment 7, 2005. (© BERR).



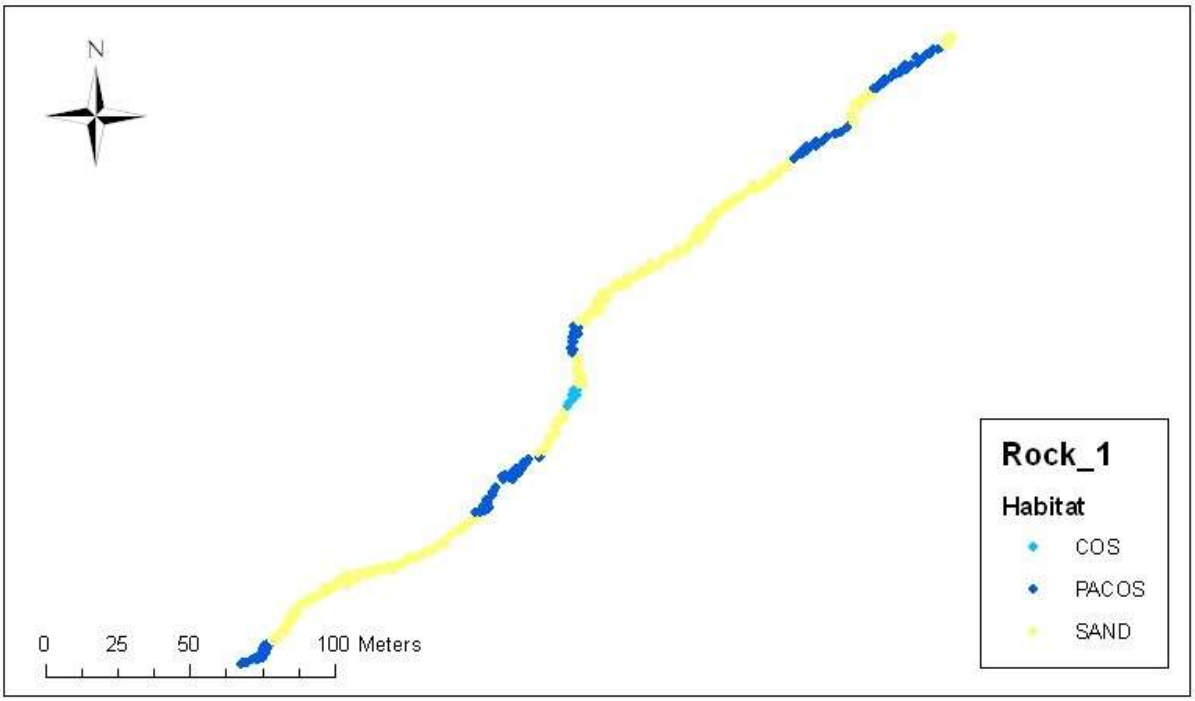
Sidescan sonar data obtained from the Department of Trade and Industry Strategic Environmental Assessment 7, 2005. (© BERR).

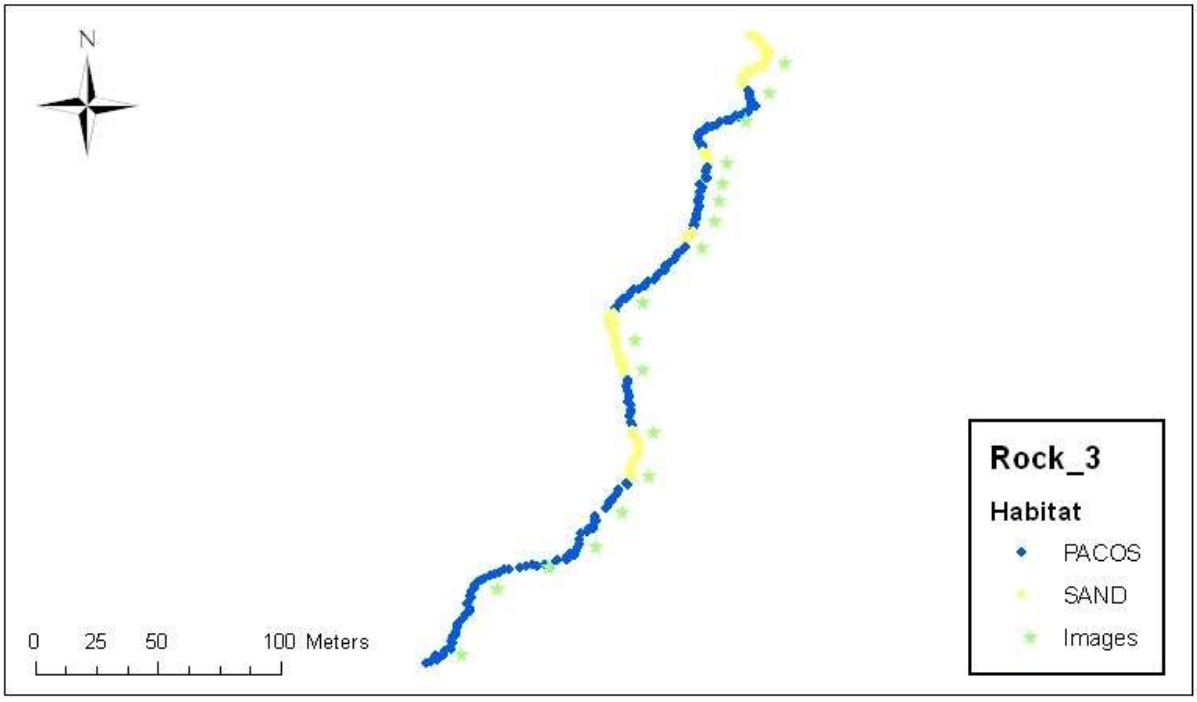


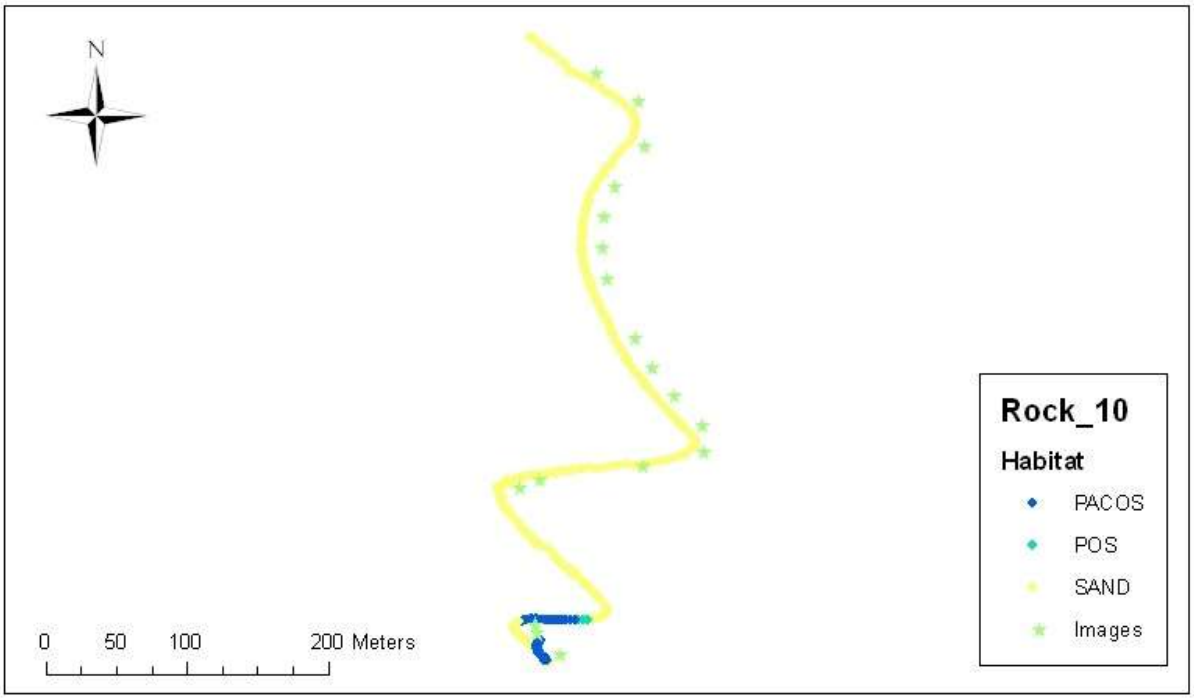
Sidescan sonar data obtained from the Department of Trade and Industry Strategic Environmental Assessment 7, 2005. (© BERR).

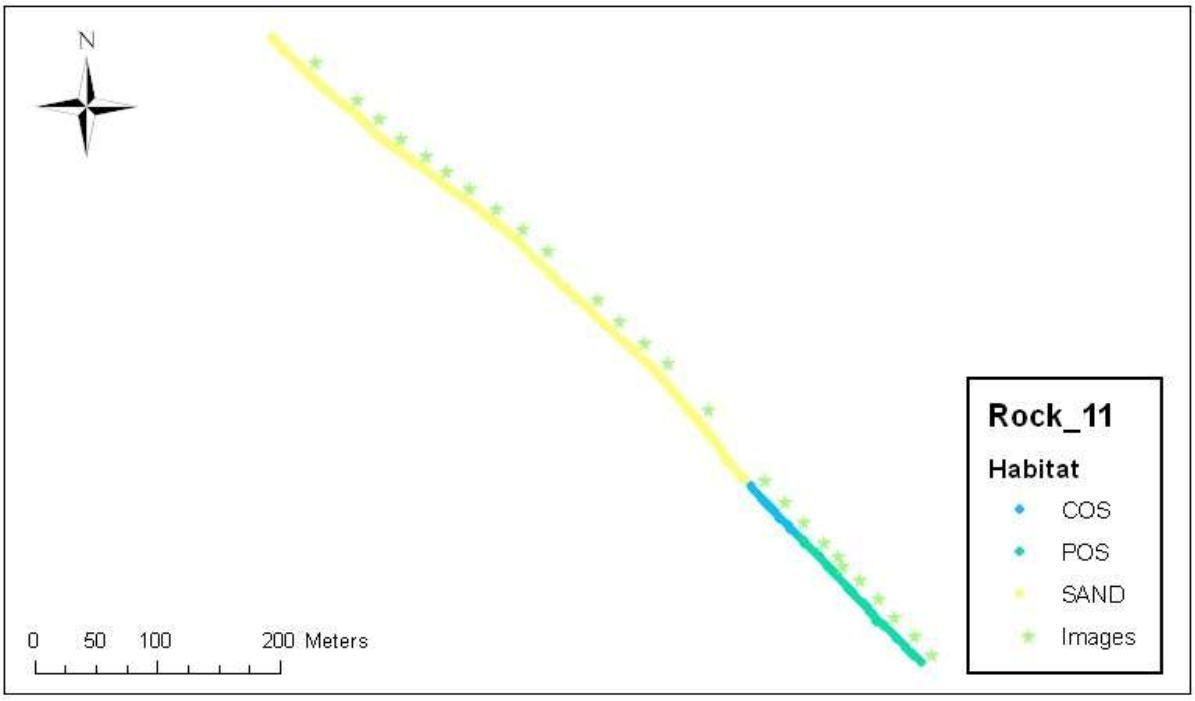


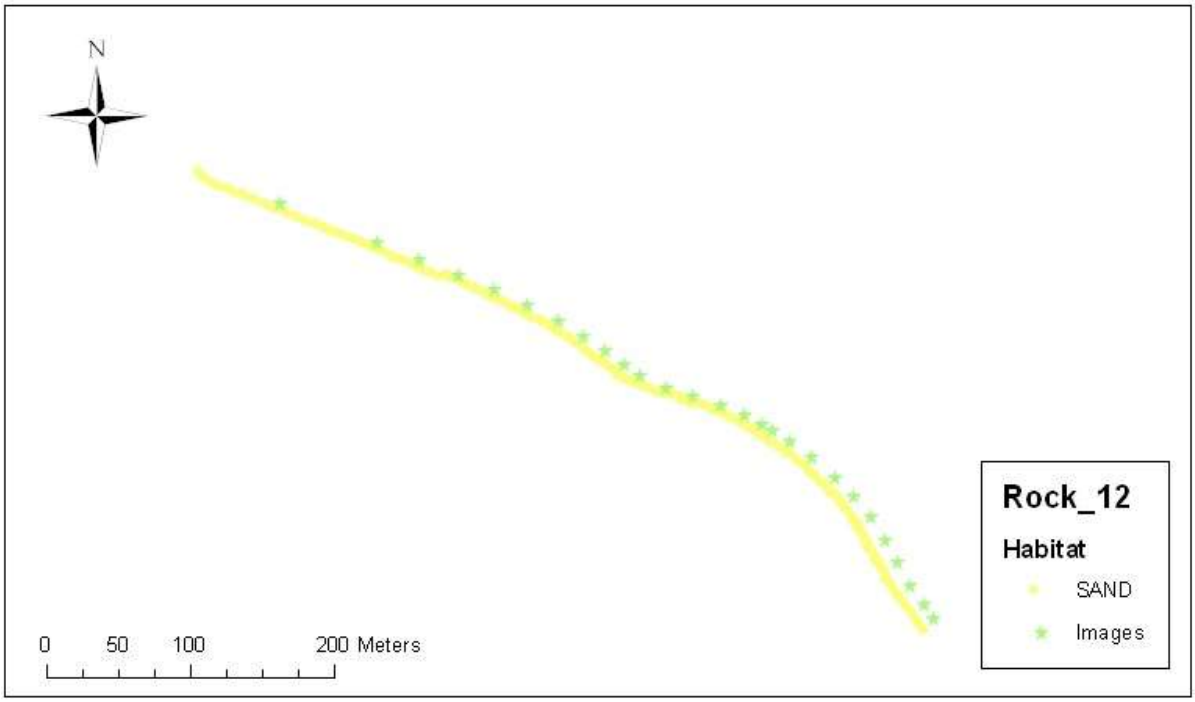
Sidescan sonar data obtained from the Department of Trade and Industry Strategic Environmental Assessment 7, 2005. (© BERR).

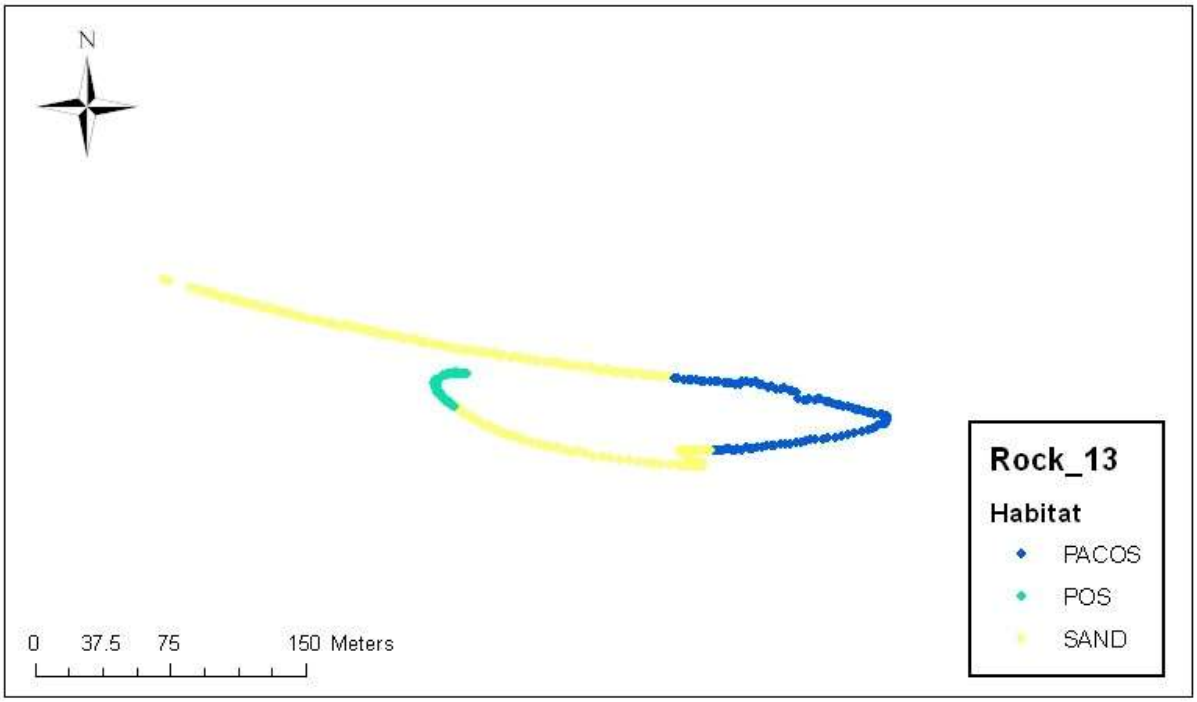

N
0
25
50
100 Meters
Rock_1
Habitat
COS
PACOS
SAND

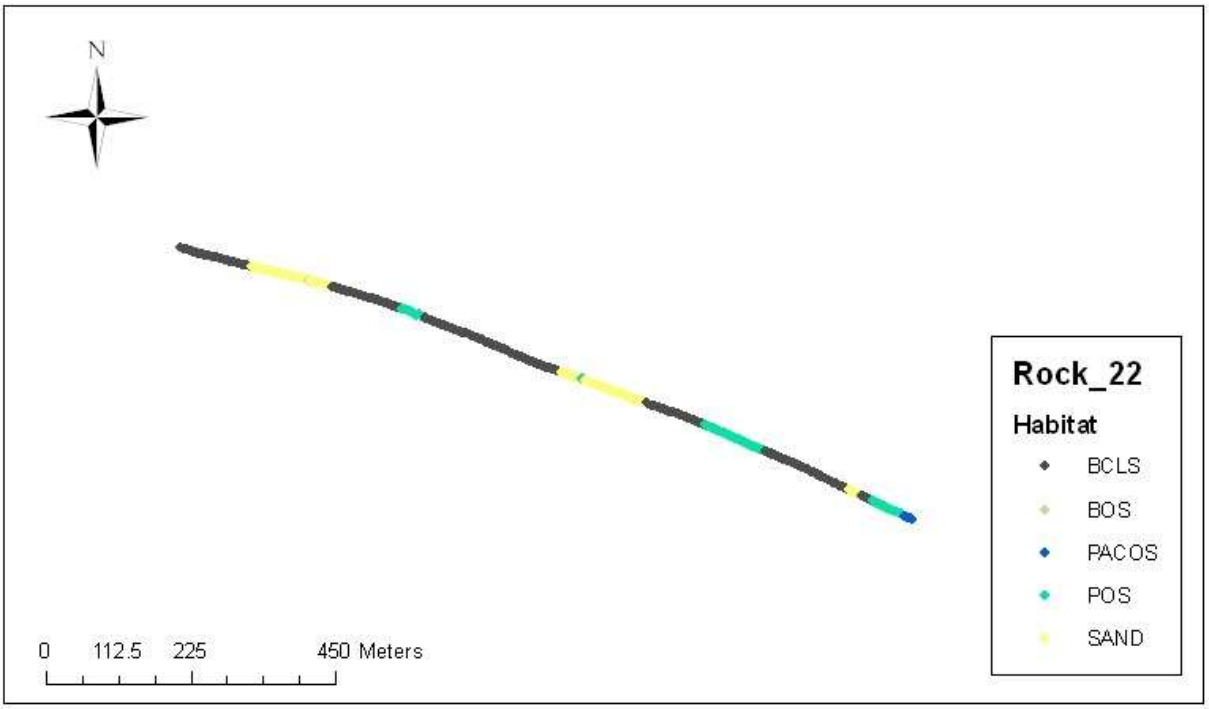

N
0
25
50
100 Meters
Rock_3
Habitat
PACOS
SAND
Images

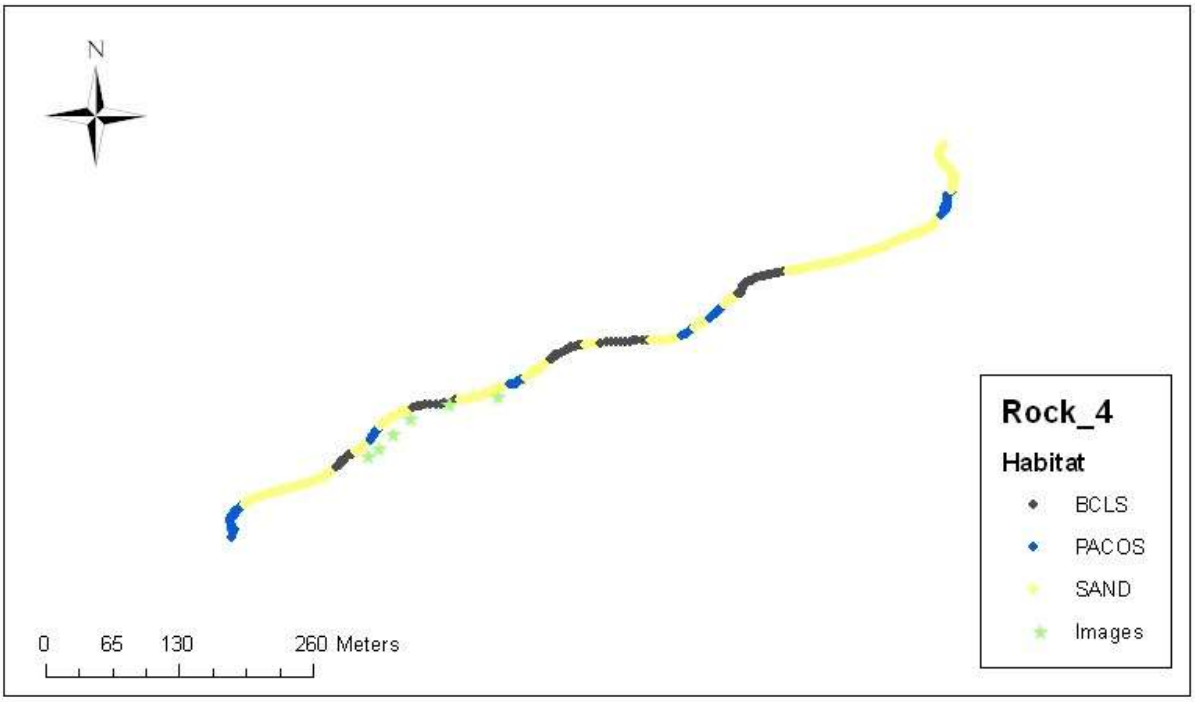

N
0 50 100 200 Meters
Rock_10
Habitat
PACOS
POS
SAND
Images

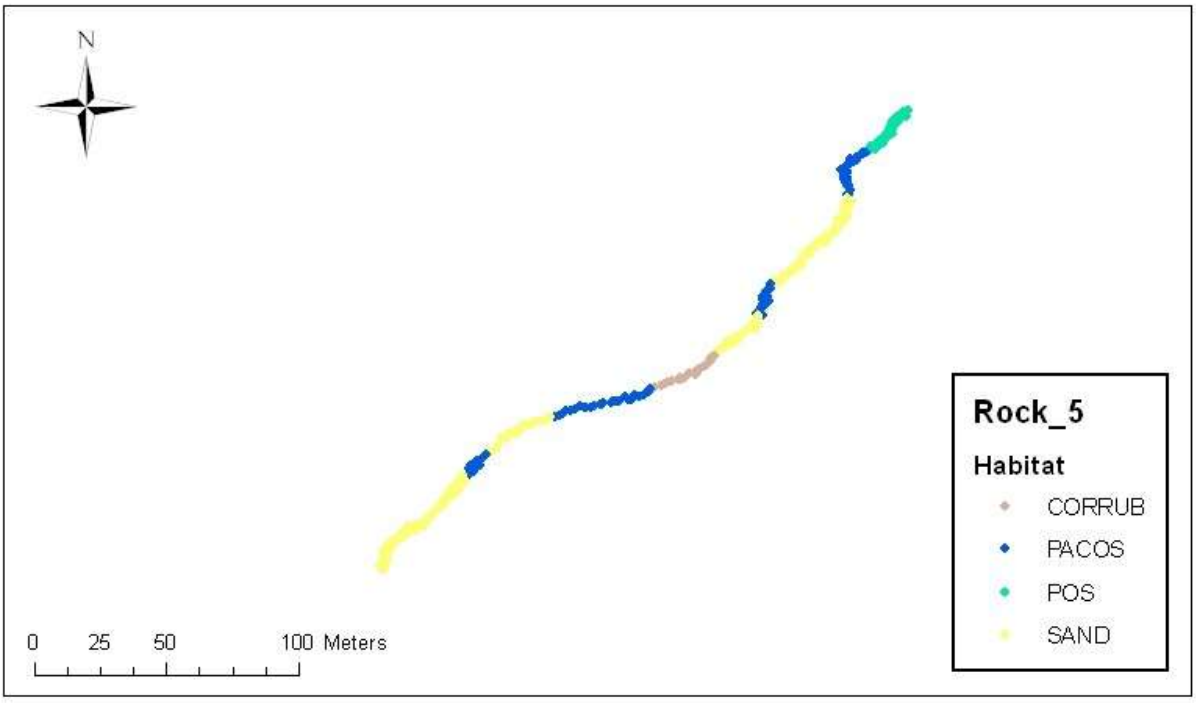

N
0 50 100 200 Meters
Rock_11
Habitat
COS
POS
SAND
Images


N
0
50
100
200 Meters
Rock_12
Habitat
SAND
Images


N
0
37.5
75
150 Meters
Rock_13
Habitat
PACOS
POS
SAND


N
0
112.5
225
450 Meters
Rock_22
Habitat
BCLS
BOS
PACOS
POS
SAND


N
0 65 130 260 Meters
Rock_4
Habitat
BCLS
PACOS
SAND
Images


N
0 25 50 100 Meters
Rock_5
Habitat
CORRUB
PACOS
POS
SAND

Appendix 3: Description of photographs

Appendix 3.1 Rockall Bank SEA7 stations

SAMS_2_L #5, 18August 2005: Total photos = 17, usable photos = 17

Photo	Time GMT	Depth m	Description
SAMS_2_L#5_01	15:26:10	165.7	Medium sandy sea bed with some signs of infaunal activity in the form of holes (burrows) in the sediment. An ophiuroid (probably *Ophiactis* sp) is the only visible fauna in this image.
SAMS_2_L#5_02	15:27:54	166.3	Medium sandy sea bed with some shell. No signs of bioturbation and no visible fauna.
SAMS_2_L#5_03	15:28:31	164.5	Medium sandy sea bed with some shell. No signs of bioturbation and no visible fauna.
SAMS_2_L#5_04	15:29:27	164.5	Medium sandy sea bed with some shell. No signs of bioturbation and no visible fauna.
SAMS_2_L#5_05	15:30:22	163.8	Medium sandy sea bed with some shell. No signs of bioturbation and no visible fauna.
SAMS_2_L#5_06	15:31:55	164.7	Medium sandy sea bed with some shell and detritus. No signs of bioturbation and no visible fauna.
SAMS_2_L#5_07	15:35:08	166.0	Medium sandy sea bed with some shell and detritus. No signs of bioturbation and no visible fauna.
SAMS_2_L#5_08	15:41:13	164.0	Medium sandy sea bed. No signs of bioturbation. The asteroid *Hippasteria phrygiana* is the only visible fauna.
SAMS_2_L#5_09	15:42:31	165.5	Coarse sandy sea bed with some shell gravel. No signs of bioturbation and no visible fauna.
SAMS_2_L#5_10	15:44:33	165.0	Coarse sandy sea bed with some shell gravel. No signs of bioturbation and no visible fauna.
SAMS_2_L#5_11	15:45:14	164.3	Coarse sandy sea bed with some shell gravel and detritus. No signs of bioturbation and no visible fauna.
SAMS_2_L#5_12	15:45:47	164.3	Coarse sandy sea bed with some shell gravel and detritus. No signs of bioturbation and no visible fauna.
SAMS_2_L#5_13	15:47:47	166.8	Coarse sandy sea bed with some shell gravel and detritus. No signs of bioturbation. The only visible fauna is the asteroid *Stichastrella rosea*, and an unidentified organism (possibly a tube worm).
SAMS_2_L#5_14	15:50:41	163.5	Coarse sandy sea bed with some shell gravel and detritus. No signs of bioturbation and no visible fauna.
SAMS_2_L#5_15	15:53:23	164.5	Coarse sandy sea bed with some shell gravel and detritus. No signs of bioturbation and no visible fauna.
SAMS_2_L#5_16	15:57:32	164.8	Medium sandy sea bed with some shell. No signs of bioturbation and no visible fauna.
SAMS_2_L#5_17	15:58:34	164.8	Medium sandy sea bed with some shell. No signs of bioturbation and no visible fauna.

SAMS_2_M #3, 18August 2005: Total photos = 40, usable photos =36

Photo	Time GMT	Depth m	Description
SAMS_2_M#3_01	10:26:38	184.8	Coarse sandy sea bed with much organic debris (*Cidaris* spine and brachiopod shells) and a large area of bedrock (74%). Conspicuous species include several growths of the bryozoans *Reteporella* sp, *Exidmonea atlantica* and other erect cyclostome bryozoans. Other fauna include serpulid worm tubes, encrusting sponges, bryozoans and unidentified small white encrusting species
SAMS_2_M#3_02	10:30:10	182.8	Bedrock (100%) with some sand cover. Conspicuous species include erect bryozoans (*Reteporella* sp) and cup sponges (possibly *Axinella* sp), with a small squat lobster (probably *M. rugosa*) taking shelter beneath a *Reteporella* growth. Encrusting sponges are also present.
SAMS_2_M#3_03	10:30:45	185.5	Bedrock (100%) with some sand cover. Conspicuous species include erect bryozoans (*Reteporella* sp) and cup sponges (possibly *Axinella* sp), with a small ophiuroid (possibly *Ophiactis* sp) taking shelter beneath a *Reteporella* growth. Encrusting sponges and serpulid worm tubes are also present.
SAMS_2_M#3_04	10:32:00	181.5	Bedrock (100%) with some sand cover. Conspicuous species include erect bryozoans (*Reteporella* sp and cyclostome bryozoans) and cup sponges (*Axinella* sp and Phakellia sp) Encrusting sponges are also present.
SAMS_2_M#3_05	10:32:20	183.8	Image too dark, habitat looks similar to 8.
SAMS_2_M#3_06	10:32:41	182.0	Bedrock (100%) with some sand cover. Conspicuous species include erect bryozoans (*Reteporella* sp and cyclostome bryozoans) and cup sponges (possibly *Axinella* sp). Encrusting sponges are also present. A crinoid (*Antedon potassus*?) and asteroid *Henricia sanguinolenta* are clearly visible.
SAMS_2_M#3_07	10:32:49	182.8	Bedrock (100%) with some sand cover. Conspicuous species include erect bryozoans (*Reteporella* sp and cyclostome bryozoans) and cup sponges (possibly *Axinella* sp). Encrusting sponges and serpulid worm tubes are also present. An unidentified spider crab (*Majidae*) is also visible.

SAMS_2_M#3_08	10:33:51	181.3	Coarse sandy sea bed with pebbles and cobbles (39%). Conspicuous species include erect bryozoans (*Reteporella* sp and cyclostome bryozoans) and cup sponges (possibly *Axinella* sp). Encrusting sponges are also present. An unidentified decapod and two *Munida* (probably *M. rugosa*) are just visible via their claws.
SAMS_2_M#3_09	10:35:00	181.0	Coarse sandy sea bed with pebbles and cobbles (39%). Conspicuous species include erect bryozoans (*Reteporella* sp and cyclostome bryozoans) and cup sponges (possibly *Axinella* sp). A possible zoanthid, encrusting sponges, bryozoans and other unidentified species are also present. A squat lobster (probably *Munida rugosa*) is just visible beneath a *Reteporella* growth via its claws.
SAMS_2_M#3_10	10:35:54	183.0	Coarse sandy seabed and bedrock (66%) with some sand cover. Conspicuous species include erect bryozoans (*Reteporella* sp and cyclostome bryozoans) and cup sponges (possibly *Axinella* sp). Encrusting sponges are also present.
SAMS_2_M#3_11	10:37:18	181.3	Coarse sandy sea bed and bedrock (22%) with some sand cover. Conspicuous species include erect bryozoans (*Reteporella* sp) and possible zoanthids. Encrusting sponges and bryozoans are also present.
SAMS_2_M#3_12	10:38:45	182.8	Bedrock (93%) with some sand cover. Conspicuous species include erect bryozoans (*Reteporella* sp and cyclostome bryozoans). Encrusting sponges, bryozoans and serpulid worm tubes are also present.
SAMS_2_M#3_13	10:39:16	182.0	Image out of focus, fauna and habitat similar to previous image.
SAMS_2_M#3_14	10:39:56	181.5	Bedrock (100%) with some sand cover. Conspicuous species include erect bryozoans (*Reteporella* sp and cyclostome bryozoans) and cup sponges (possibly *Axinella* sp) and encrusting sponges. Serpulid worm tubes, encrusting bryozoans, and unidentified small white encrusting species are also present. The asteroid *Henricia sanguinolenta* is clearly visible.
SAMS_2_M#3_15	10:40:17	185.8	Bedrock (100%) with some sand cover. Conspicuous species include erect bryozoans (*Reteporella* sp and cyclostome bryozoans), lamellate form sponges and encrusting sponges. Serpulid worm tubes, cup sponges (possibly *Axinella* sp), encrusting bryozoans, and unidentified small white encrusting species are also present.
SAMS_2_M#3_16	10:40:39	182.0	Image out of focus, similar to previous image.

SAMS_2_M#3_17	10:40:57	181.8	Coarse sandy sea bed with boulders and sand covered bedrock (48%). Conspicuous species include erect bryozoans (*Reteporella* sp), possible zoanthids, and encrusting sponges. Serpulid worm tubes, encrusting bryozoans, and unidentified small white encrusting species are also present. The asteroid *Henricia sanguinolenta* and three *Munida* (probably *M. rugosa*) are clearly visible.
SAMS_2_M#3_18	10:41:39	182.5	Poor image, very similar habitat to previous image.
SAMS_2_M#3_19	10:41:46	185.0	Poor image, very similar habitat to previous image.
SAMS_2_M#3_20	10:42:13	182.3	Poor image, very similar habitat to previous image.
SAMS_2_M#3_21	10:43:18	187.5	Repeat of 22
SAMS_2_M#3_22	10:43:44	181.3	Medium sandy sea bed with the odd pebble, no signs of bioturbation. An unidentified spider crab (*Majidae*) is the only visible fauna.
SAMS_2_M#3_23	10:43:50	181.5	Repeat of 22.
SAMS_2_M#3_24	10:44:26	181.5	Repeat of 22.
SAMS_2_M#3_25	10:45:30	180.0	Medium sandy sea bed with some solid matter (that does not appear to be rock), no signs of bioturbation. *Munida rugosa* and an unidentified hydrocoral are the only visible fauna.
SAMS_2_M#3_26	10:46:25	180.5	Coarse sandy sea bed and sand covered bedrock (95%). Conspicuous species include erect bryozoans (*Reteporella* sp) and possible zoanthids. Encrusting bryozoans and sponges are also present. *Munida rugosa* squat lobsters are clearly visible.
SAMS_2_M#3_27	10:46:57	181.8	Sand covered bedrock (71%) and cobbles. Conspicuous species include erect bryozoans (*Reteporella* sp and cyclostome bryozoans) and possible zoanthids. Serpulid worm tubes, encrusting bryozoans and sponges are also present. The claws of a squat lobster (probably *Munida rugosa*) are visible beneath a cobble.
SAMS_2_M#3_28	10:48:05	184.8	Medium to fine sandy sea bed with sand covered bedrock. No visible fauna.
SAMS_2_M#3_29	10:48:25	182.3	Image too dark, not used.
SAMS_2_M#3_30	10:48:54	181.0	Bedrock (100%) with some sand cover. Conspicuous species include erect bryozoans (*Reteporella* sp and cyclostome bryozoans) encrusting sponges and a solitary coral (*Caryophyllia*). The asteroid *Henricia sanguinolenta* and an unidentified flatfish are clearly visible.
SAMS_2_M#3_31	10:49:48	181.3	Bedrock (100%) with some sand cover. Conspicuous species include erect bryozoans (*Reteporella* sp and cyclostome bryozoans), possible zoanthids, and encrusting sponges. Serpulid worm tubes and encrusting bryozoans are also present.

SAMS_2_M#3_32	10:50:42	184.8	Poor image, sea bed appears composed of medium sand with bedrock out crops.
SAMS_2_M#3_33	10:51:48	181.3	Bedrock (100%) with some sand cover. Conspicuous species include erect bryozoans (*Reteporella* sp and cyclostome bryozoans), possible zoanthids, lobose form and encrusting sponges. Serpulid worm tubes, encrusting bryozoans, and other unidentified encrusting species are also present. The asteroid *Henricia sanguinolenta* and an unidentified spider crab (*Majidae*) are clearly visible.
SAMS_2_M#3_34	10:53:27	181.3	Bedrock (100%) with some sand cover. Conspicuous species include erect bryozoans (*Reteporella* sp), possible zoanthids and encrusting sponges. Serpulid worm tubes and encrusting bryozoans are also present. Two asteroids (*Henricia sanguinolenta*) and an unidentified holothurian are clearly visible.
SAMS_2_M#3_35	10:54:58	180.8	Medium sandy sea bed with the odd pebble (<1), no signs of bioturbation. No visible fauna.
SAMS_2_M#3_36	10:56:07	182.0	Medium sand over bedrock seabed with pebbles (12%).Conspicuous species include erect bryozoans (*Reteporella* sp and cyclostome bryozoans) and possible zoanthids. Serpulid worm tubes, encrusting sponges and bryozoans are also present.
SAMS_2_M#3_37	10:57:00	181.3	Sand covered bedrock (54% hard substratum) and coarse sandy sea bed with, organic debris, pebbles and cobbles. Sand covered bedrock fauna, typical of the previous images and includes erect bryozoans (*Reteporella* sp and cyclostome bryozoans) and possible zoanthids. Other conspicuous species in this image include an unidentified flatfish and a stylasterid coral (appears dead). Serpulid worm tubes, encrusting sponges and bryozoans are also present. Two squat lobsters (probably *Munida rugosa*) are just visible beneath cobbles via their claws.
SAMS_2_M#3_38	10:58:02	180.3	Sand covered bedrock (42% exposed hard substratum) and coarse sandy sea bed with pebbles and cobbles. Conspicuous species include erect bryozoans (*Reteporella* sp), possible zoanthids, globose form and encrusting sponges. Encrusting bryozoans are also present. *Munida rugosa* are visible among the cobbles.
SAMS_2_M#3_39	10:59:05	182.0	Coarse sand covered bedrock (<1% hard substratum exposed). Visible fauna are few but include an erect cyclostome bryozoan growth, possible zoanthids, and a globose form sponge.
SAMS_2_M#3_40	11:00:15	180.5	Coarse sand covered bedrock (<1% hard substratum exposed). Visible fauna are few but include possible zoanthids, encrusting and globose form sponges.

SAMS_2_M #2, 18 August 2005: Total photos = 17, usable photos = 16

Photo	Time GMT	Depth m	Description
SAMS_2_M#2_01	09:42:58	186.3	Medium sandy sea bed. No signs of bioturbation and no visible fauna.
SAMS_2_M#2_02	09:44:53	186.0	Medium sandy sea bed. No signs of bioturbation and no visible fauna.
SAMS_2_M#2_03	09:48:15	187.5	Medium sandy sea bed. No signs of bioturbation and no visible fauna.
SAMS_2_M#2_04	09:49:57	188.3	Medium sandy sea bed. No signs of bioturbation and no visible fauna.
SAMS_2_M#2_05	09:52:34	187.5	Medium sandy sea bed with clinker, shell gravel and detritus in places, some signs of bioturbation. No visible fauna.
SAMS_2_M#2_06	09:53:49	189.3	Medium sandy sea bed. No signs of bioturbation. The asteroid *Asterias rubens* is the only visible fauna.
SAMS_2_M#2_07	09:55:07	189.3	Medium sandy sea bed with clinker and pebbles (19%). Few visible fauna accept an erect branching bryozoan (*Exidmonea* sp probably *E. atlantica*) and encrusting sponges and bryozoans on the larger pebbles.
SAMS_2_M#2_08	09:56:18	188.3	Medium sandy sea bed with clinker and pebbles (10%). Visible fauna include three *Munida* (probably *M. rugosa*) two of which are only visible by their claws, an unidentified small white anemone and plumose anemone, two solitary coral polyps (Caryophyllids?) and *Caryophyllia* sp, can be seen attached to the pebbles. Erect bryozoans (*Reteporella* sp and Cyclostome bryozoans), encrusting bryozoans and sponges are also present attached to the pebbles.
SAMS_2_M#2_09	09:56:57	187.5	Medium sandy sea bed with clinker, pebbles and cobbles (39%). Visible fauna include the asteroid *Porania pulvillus* and five *Munida* (probably *M. rugosa*), most of which are hidden among the cobbles. All other fauna are attached or encrusting forms and include a small growth of Cyclostome bryozoan, serpulid worm tubes, encrusting sponges, bryozoans and unidentified small white encrusting species.
SAMS_2_M#2_10	09:57:12	188.0	Repeat of 09.

SAMS_2_M#2_11	09:58:15	187.5	Medium sandy sea bed with cobbles (70%) and areas of sand covered bedrock. Visible mobile species include holothurians *Stichopus tremulus* and an unidentified species, the squat lobster *Munida* (probably *M. rugosa*) with individuals characteristically concealed beneath cobbles, and an unidentified fish species. Attached and encrusting species of note are the erect bryozoans *Reteporella* sp and Cyclostomes, several small growths of cup sponge (possibly *Axinella* sp) and clusters of possible zoanthids or corals. Encrusting sponges, bryozoans and unidentified small white encrusting species are also present.
SAMS_2_M#2_12	09:58:51	186.8	Medium sand covering a bedrock sea bed (3% exposed hard ground). All visible species are attached or encrusting forms, the most conspicuous of which are growths of the cyclostome bryozoan *Hornera lichenoides* and an unidentified species of stylasterid coral. Cup sponges (possibly *Axinella* sp), a globose sponge, scattered individuals of a possible small solitary coral are present together with other encrusting sponges and bryozoans.
SAMS_2_M#2_13	09:59:56	186.5	Pebbly, cobbled sea bed (90%). The holothurian *Stichopus tremulus* is the most conspicuous species. An unidentified crustacean and two *Munida* (probably *M. rugosa*) are concealed among the cobbles. A possible zoanthid, serpulid worm tubes and encrusting sponges, bryozoans and unidentified small white encrusting species are also present.
SAMS_2_M#2_14	10:00:46	188.0	Medium sandy sea bed bordering an area of coarser sand and pebbly, cobbled sea bed (89%). Visible fauna include the squat lobster *Munida* (probably *M. rugosa*), a growth of the erect bryozoan *Reteporella* sp, and small unidentified anemones. Serpulid worm tubes, encrusting sponges, bryozoans and unidentified small white encrusting species are also present.
SAMS_2_M#2_15	10:01:32	185.3	Image out of focus, similar to 17.
SAMS_2_M#2_16	10:02:37	186.3	Medium and coarse sandy sea bed largely covered with pebbles and cobbles (72%). Seven *Munida* (probably *M. rugosa*) are visible hiding among the cobbles. Other fauna include serpulid worm tubes, encrusting sponges, bryozoans and unidentified small white encrusting species.
SAMS_2_M#2_17	10:03:13	188.5	Bedrock sea bed with a thin covering of sand (2% exposed hard ground). Conspicuous species include the erect bryozoan *Reteporella* sp and several individuals of possible zoanthids. Cup sponges (possibly *Axinella* sp), globose form sponges and very small growths of cyclostome bryozoans are also present as well as encrusting sponges and bryozoans. A flatfish is just visible in the centre of the image.

SAMS_2_O #4, 18 August 2005: Total photos = 17, usable photos = 15

Photo	Time GMT	Depth m	Description
SAMS_2_O#4_01	02:50:54	210.0	Image out of focus, not used.
SAMS_2_O#4_02	02:51:06	209.0	Medium sandy sea bed with some clinker. No visible fauna.
SAMS_2_O#4_03	02:53:30	211.3	Medium to fine sandy sea bed with some organic debris (dead *Reteporella* and solitary corals (*Caryophyllia* sp)). Live *Caryophyllia* sp polyps are present.
SAMS_2_O#4_04	02:56:00	210.0	Medium sandy sea bed with the occasional cobble (9%), clinker and some detritus. All visible fauna are focused around or on the cobble. Zoanthids?, *Caryophyllia* sp 4 and 5, *Reteporella* and encrusting sponge and bryozoans are attached to the cobble. The claws of a *Munida rugosa* are visible under the cobble.
SAMS_2_O#4_05	02:57:30	209.5	Medium sandy sea bed with the odd pebble (<1%) and clinker. Three *Caryophyllia* sp 5 are the only visible fauna.
SAMS_2_O#4_06	02:59:40	211.0	Medium sandy sea bed with some detritus. *Caryophyllia* sp 5, an unidentified anemone (obscured by sediment clouds) and a palaemonid shrimp are the only visible fauna.
SAMS_2_O#4_07	03:04:15	211.0	Medium sandy sea bed with some clinker. No visible fauna.
SAMS_2_O#4_08	03:05:33	211.5	Medium sandy sea bed with some detritus. A single polyp of *Caryophyllia* sp 5 is the only visible fauna.
SAMS_2_O#4_09	03:07:16	215.8	Medium sandy sea bed with clinker and some detritus. Four polyps of *Caryophyllia* sp 5 are the only visible fauna.
SAMS_2_O#4_10	03:09:22	211.3	Medium sandy sea bed and clinker with the odd cobble (2%). All visible fauna are focused around or on the cobble. The most conspicuous fauna are a large yellow globose sponge attached to the cobble and *Munida rugosa* and an unidentified crustacean sheltering under the cobble. Encrusting sponge and serpulid worm tubes are also attached to the cobble.
SAMS_2_O#4_11	03:09:53	210.3	Poor image, not used.
SAMS_2_O#4_12	03:11:36	211.5	Medium sandy sea bed with some detritus and clinker. No visible fauna.

SAMS_2_O#4_13	03:11:50	211.8	Medium sandy sea bed and sand covered bedrock (6% hard ground exposed) heavily encrusted by what appears to be globose sponge where bedrock is exposed. Other attached fauna include erect bryozoans (*Reteporella* and Cyclostome bryozoans), an unidentified hydrocoral and anemone, Caryophyllid corals and serpulid worm tubes. Two species of Ophiuroid are present, the small ophiuroid species (possible *Ophiactis* sp) and the larger (probably *Ophiopholis aculeata*).
SAMS_2_O#4_14	03:13:19	210.3	Medium sandy sea bed with clinker and a large boulder (44%). The boulder is heavily encrusted with organisms including large growths of *Reteporella* and cyclostome bryozoans, encrusting sponges, *Pheronema carpentrii* and a large yellow globose sponge, as well as many other unidentified species. *Caryophyllia* sp 5 and *Munida rugosa* are visible on the sediment near the boulder.
SAMS_2_O#4_15	03:14:02	210.8	Medium sandy sea bed with some detritus and clinker. No visible fauna.
SAMS_2_O#4_16	03:16:39	211.0	Medium sandy sea bed with some detritus and clinker. No visible fauna.
SAMS_2_O#4_17	03:18:29	210.3	Medium sandy sea bed. No visible fauna.

SAMS_2_N #1, 18 August 2005: Total photos = 17, usable photos = 16

Photo	Time GMT	Depth m	Description
SAMS_2_N#1_01	04:40:02	220.3	Medium sandy sea bed. No visible fauna
SAMS_2_N#1_02	04:41:40	220.3	Medium sandy sea bed. No visible fauna
SAMS_2_N#1_03	04:42:49	221.2	Medium sandy sea bed with the odd pebble (>1%). Only visible fauna is a lobose form sponge attached to a pebble.
SAMS_2_N#1_04	04:44:24	223.3	Medium sandy sea bed. A large angler fish (*Lophius piscatorius*) is hidden in the sediment.
SAMS_2_N#1_05	04:44:39	220.8	Repeat of 04
SAMS_2_N#1_06	04:46:14	221.3	Medium sandy sea bed. The only visible fauna is the asteroid *Stichastrella rosea*. An unidentified object, possibly faunal in nature, is also present in the image.
SAMS_2_N#1_07	04:47:03	220.5	Medium sandy sea bed. Partially buried globose sponge forms are visible, with what appears to be dead *Reteporella* fragments and Caryophyllid coral polyps nearby.
SAMS_2_N#1_08	04:48:29	220.3	Medium sandy sea bed with the odd cobble (2%) and type 3 ripples. The only visible fauna, *Caryophyllia* sp a globose form sponge and hydroids are attached to a cobble.
SAMS_2_N#1_09	04:49:57	220.8	Medium sandy sea bed. No visible fauna except possibly two siphons emerging from the sediment.
SAMS_2_N#1_10	04:51:38	219.5	Medium sandy sea bed with clinker and signs of current scour. No visible fauna.
SAMS_2_N#1_11	04:53:43	221.2	Medium sandy sea bed with signs of current scour. No visible fauna.
SAMS_2_N#1_12	04:57:41	220.8	Medium sandy sea bed with possible early type 3 ripples. No visible fauna.
SAMS_2_N#1_13	04:59:56	221.0	Medium sandy sea bed with some detritus. No visible fauna.
SAMS_2_N#1_14	05:02:17	221.3	Medium sandy sea bed with possible early type 3 ripples. No visible fauna.
SAMS_2_N#1_15	05:04:34	220.0	Medium sandy sea bed possibly with sand covered bedrock (2%). Possible early type 3 ripples. Caryophyllids?, encrusting, globose and cup form sponges all attached to underlying bedrock?
SAMS_2_N#1_16	05:06:27	221.8	Fine sandy sea bed that looks as though it has been suddenly deposited in the area and may be covering bedrock outcrop. The fauna, a large lobose form sponge and what may be a Caryophyllid (solitary coral), appears smothered. A dead Caryophyllid polyp and *Madrepora* fragments are also present.
SAMS_2_N#1_17	05:09:39	219.8	Medium sandy seabed with some signs of current scour.

SAMS_2_P #1, 17August 2005: Total photos = 10, usable photos = 8

Photo	Time GMT	Depth m	Description
SAMS_2_P#1_01	21:25:50	238.5	Medium sandy sea bed with signs current movement. No visible fauna.
SAMS_2_P#1_02	21:27:05	238.8	Repeat of 01.
SAMS_2_P#1_03	21:29:29	237.3	Medium sandy sea bed with some detritus and signs of bioturbation and/or current movement. Two unidentified items, likely to be organic debris.
SAMS_2_P#1_04	21:29:39	238.5	Repeat of 03.
SAMS_2_P#1_05	21:35:24	242.3	Medium sandy sea bed with clinker and some detritus. Some signs of bioturbation and/or current movement. No visible fauna.
SAMS_2_P#1_06	21:36:37	237.5	Medium sandy sea bed with clinker, some detritus, and signs of bioturbation and/or current movement. No visible fauna.
SAMS_2_P#1_07	21:40:44	239.0	Medium sandy sea bed with clinker and some detritus. Signs of bioturbation and /or current movement. No visible fauna.
SAMS_2_P#1_08	21:41:39	238.8	Medium sandy sea bed with some detritus. Signs of bioturbation and/or current movement, possible type 3 ripples. One unidentified item as in image 03, likely to be organic debris.
SAMS_2_P#1_09	21:44:29	243.3	Medium sandy sea bed with some detritus. Signs of bioturbation and /or current movement. No visible fauna.
SAMS_2_P#1_10	21:46:05	239.3	Medium sandy sea bed with the occasional cobble (7%) and clinker. Signs of current movement, possible type 3 ripples. All fauna are associated with the cobble and include a small growth of Stylasterid coral, yellow globose sponge forms, encrusting bryozoans, hydroids.

ER-O #1, 20August 2005: Total photos = 89, usable photos = 83

Photo	Time GMT	Depth m	Description
ER-O#1_01	06:33:33	398.8	Coarse sandy sea bed and boulders (30%). At least 4 morphospecies of encrusting sponge are visible in this image. A possible solitary coral (Caryophyllid) and encrusting bryozoans can also be seen.
ER-O#1_02	06:35:29	404.8	Image out of focus, sea bed appears composed of coarse sand, gravel and pebbles.
ER-O#1_03	06:36:43	396.8	Image out of focus, sea bed appears composed of coarse sand and gravel.
ER-O#1_04	06:36:53	401.5	Shell gravely sea bed largely covered with pebbles and cobbles (55%). The spine of a single *Cidaris cidaris* can be seen in this image with encrusting bryozoans present on the cobbles.
ER-O#1_05	06:40:22	421.8	Shell gravely sea bed largely covered with pebbles and cobbles (48%). Visible fauna include encrusting bryozoans, sponges, and small white unidentified encrusting organisms.
ER-O#1_06	06:42:48	419.0	Shell gravely sea bed with organic debris including coral, and pebbles (2%). No visible identifiable fauna.
ER-O#1_07	06:44:07	418.0	Image out of focus, not used.
ER-O#1_08	06:44:22	421.5	Coarse sandy sea bed with bedrock out crop (66%). A large growth of Styalsterid coral with globose sponge forms interspersed dominate the image. Serpulid worm tubes, hydroids and encrusting bryozoans, sponges and unidentified small white encrusting organisms are visible on the bedrock.
ER-O#1_09	06:48:22	422.8	Coarse sandy sea bed with scattered pebbles and cobbles (11%). Few visible fauna. A single echinoid (*Cidaris cidaris*) is the most conspicuous fauna with serpulid worm tubes and encrusting bryozoans on the pebbles and cobble.
ER-O#1_10	06:50:47	430.5	Coarse sandy sea bed with organic debris (brachiopod shells, coral, and *Cidaris* spines), pebbles and cobbles (15%). Visible fauna include a squat lobster (probably *Munida rugosa*) hidden beneath a pebble, an undetermined number of small ophiuroids (<10, possibly *Ophiactis* sp) centred in a piece of dead sponge and within the crevices of a cobble, with only arms protruding. Encrusting bryozoans are also present.
ER-O#1_11	06:53:11	431.3	Coarse sandy sea bed mainly covered with organic debris (brachiopod shells, coral, and *Cidaris* spines) and pebbles. No visible fauna.
ER-O#1_12	06:56:55	442.8	Coarse sandy seabed adjacent to an area of bedrock (65%). Bedrock is encrusted with sponges, bryozoans and unidentified small white encrusting species. A serpulid worm tube and stylasterid coral are the most conspicuous fauna, with three small unidentified ophiuroid species visible on the bedrock in the centre of the image.

ER-O#1_13	06:59:25	437.0	Coarse sandy sea bed largely covered with organic debris (brachiopod shells, coral, and *Cidaris* spines), pebbles and cobbles (5%). The only visible fauna are hydroids and encrusting sponges and bryozoans.
ER-O#1_14	07:06:51	447.8	Coarse sandy sea bed almost completely covered in organic debris (brachiopod shells, coral, and *Cidaris* spines) and pebbles 2%. No identifiable fauna.
ER-O#1_15	07:07:32	453.8	Coarse sandy sea bed almost completely covered with organic debris (brachiopod shells, coral, and *Cidaris* spines) and pebbles (4%). No identifiable fauna
ER-O#1_16	07:12:06	455.8	Sea bed covered in organic debris (brachiopod shells, coral, and *Cidaris* spines) and pebbles (3%). The only visible fauna are small growths of encrusting sponge and/or bryozoan on some of the pebbles.
ER-O#1_17	07:15:00	459.5	Coarse sandy sea bed. The echinoid *Cidaris cidaris* and a small palaemonid shrimp are the only visible fauna.
ER-O#1_18	07:17:18	458.5	Coarse sandy sea bed with scattered organic debris (brachiopod shells and *Cidaris* spines) and pebbles (2%). The only visible fauna are encrusting bryozoans.
ER-O#1_19	07:18:56	459.0	Image out of focus, sea bed appears similar to the next image.
ER-O#1_20	07:20:35	459.3	Coarse sandy sea bed with organic debris (brachiopod shells and *Cidaris* spines) and pebbles (15%). Two scale worms (*Polynoidae*) are visible on the pebble to left of the centre of the image. The only other identifiable fauna are encrusting sponges and bryozoans on the pebbles.
ER-O#1_21	07:22:19	458.3	Coarse sandy pebbly sea bed largely covered with cobbles and boulders (86%). All visible fauna are associated with the boulders and cobbles. At least 5 morphospecies of encrusting sponges are present including two yellow forms. Encrusting bryozoans, small white unidentified encrusting organisms and other unidentified forms are also present.
ER-O#1_22	07:25:19	459.8	Very coarse sandy sea bed with pebbles and cobbles (17%). Few visible fauna, only serpulid worm tubes, encrusting sponges, bryozoans and other unidentified encrusting forms.
ER-O#1_23	07:28:16	464.3	Image out of focus, not used.
ER-O#1_24	07:29:03	461.5	Very coarse sandy sea bed with pebbles and cobbles (7%). Few visible fauna, only a large orange bivalve and possible encrusting bryozoans on the pebbles and cobbles.
ER-O#1_25	07:29:22	462.8	Coarse sandy sea bed with pebbles and cobbles (32%). Mobile epifaunal species present include the crab *Cancer bellianus* and a squat lobster (probably *Munida rugosa*). Both are associated with cobbles and pebbles respectively. On the large cobble an unidentified coral with encrusting sponge growth is visible. Other fauna include serpulid worm tubes, encrusting bryozoans, sponges, small white unidentified encrusting organisms and others.

ER-O#1_26	07:32:55	463.5	Coarse sandy sea bed with pebbles (5%). Few visible fauna however a small echinoid (*Cidaris cidaris*) is visible in the top centre of the image. The arms of an undetermined number of small ophiuroids (<10, possibly *Ophiactis* sp) can also be seen protruding from what appears to be a sponge growth. Encrusting sponges and bryozoans are also present on the pebbles.
ER-O#1_27	07:34:29	462.3	Very coarse sand sea bed with pebbles (19%) and some organic debris including stylasterid coral fragments. Few visible fauna. The arms of an undetermined number of small ophiuroids (<10, possibly *Ophiactis* sp) can also be seen protruding from beneath the sediment near a scallop shell. Serpulid worm tubes, encrusting sponges and bryozoans are also present on the pebbles.
ER-O#1_28	07:34:44	463.0	Coarse sandy sea bed with pebbles (10%). Three *Cidaris cidaris* echinoids and one squat lobster (possibly *Munida rugosa*) are the most conspicuous faunal elements of this image. The arms of an undetermined number of small ophiuroids (<10, possibly *Ophiactis* sp) can also be seen protruding from a sponge covered pebble. Serpulid worm tubes, encrusting sponges and bryozoans are also present on the pebbles.
ER-O#1_29	07:36:07	463.0	Very coarse sandy sea bed with pebbles (4%). The holothurian *Stichopus tremulus* and echinoid *Cidaris cidaris* are the most conspicuous fauna in this image. Small growths of encrusting bryozoan are also present on the pebbles.
ER-O#1_30	07:36:42	464.0	Repeat of 29.
ER-O#1_31	07:38:13	465.3	Repeat of 29.
ER-O#1_32	07:43:57	466.3	Very coarse sandy sea bed with pebbles (7%). The only visible fauna in this image are an undetermined number of small ophiuroids (<10, possibly *Ophiactis* sp) hidden within crevices in the pebbles, and small growth of encrusting bryozoans on the pebbles.
ER-O#1_33	07:47:07	469.5	Image out of focus, sea bed very similar to 32.
ER-O#1_34	07:47:17	469.5	Coarse sandy sea bed with pebbles (8%). Few visible fauna. A holothurian *Stichopus tremulus* is visible just out of shot. Small growths of encrusting bryozoans are present on some of the larger pebbles.
ER-O#1_35	07:50:17	473.8	Coarse sandy sea bed with pebbles (1%). The only visible fauna is a single echinoid *Cidaris cidaris*.
ER-O#1_36	07:51:14	478.0	Coarse sandy sea bed with pebbles, cobbles and boulders (48%). All visible fauna are attached to or encrusting on the boulders and cobbles. Two individuals of a possible solitary coral (Caryophyllid) and at least 3 morphospecies of encrusting sponges are visible. Encrusting bryozoans, small white unidentified encrusting organisms and other unidentified encrusting forms are also present.
ER-O#1_37	07:54:12	475.8	Coarse sandy sea bed with organic debris, granules and pebbles (8%). The only visible fauna is a pencil echinoid *Cidaris cidaris* and a very small unidentified ophiuroid.

ER-O#1_38	07:56:02	483.0	Coarse sandy sea bed with pebbles (4%). No visible fauna.
ER-O#1_39	07:57:14	483.3	Coarse sandy sea bed with pebbles and boulders (70%). The boulders are heavily encrusted with at least five species of encrusting sponge and also encrusting bryozoans. The boulders have many cracks and bored holes in which there are an undetermined number of small ophiuroids (>100, possibly *Ophiactis* sp) visible only via their protruding arms. Two *Munida* (probably *M. rugosa*), a possible solitary coral polyp (Caryophyllid), serpulid worm tubes and a brachiopod are obvious identifiable fauna. Many other unidentifiable encrusting species are also present.
ER-O#1_40	07:59:28	483.5	Coarse sandy sea bed with pebbles and cobbles (25%). A number of the cobbles have many cracks in which there are an undetermined number of small ophiuroids (>100, possibly *Ophiactis* sp) visible only via their protruding arms. These cobbles appear to be covered with a brown encrusting sponge. The claw of a squat lobster (probably *Munida rugosa*) is just visible beneath a pebble, and a small unidentified ophiuroid is also visible on a cobble. Encrusting sponges and bryozoans are present on the larger pebbles and cobbles.
ER-O#1_41	08:03:15	488.0	Very coarse sand with pebbles (2%). The only visible fauna in this image is the echinoid *Cidaris cidaris*.
ER-O#1_42	08:08:02	501.5	Image out of focus, sea bed appears similar to the previous image.
ER-O#1_43	08:09:44	500.0	Coarse sandy sea bed with pebbles (2%). The only visible fauna in this image is the echinoid *Cidaris cidaris*.
ER-O#1_44	08:10:57	500.3	Coarse sandy sea bed largely covered with organic debris (*Cidaris* spine and brachiopod shells) pebbles and cobbles (40%). The echinoid *Cidaris cidaris* is clearly visible in this image. In addition two squat lobsters (probably *Munida rugosa*) are concealed among the cobbles. At least two morphospecies of encrusting sponge are present on the larger cobbles. Encrusting bryozoans, serpulid worm tubes, and other encrusting species are also present.
ER-O#1_45	08:15:14	505.3	Coarse sandy sea bed with pebbles, cobbles and boulders (24%). Two *Cidaris cidaris* echinoids, an asteroid (*Stichastrella rosea*) and a possible solitary coral polyp (Caryophyllid) are clearly visible in this image. Less conspicuous species include a squat lobster (probably *Munida rugosa*), at least two morphospecies of encrusting sponge, encrusting bryozoans, serpulid worm tubes, and other encrusting species.
ER-O#1_46	08:16:10	507.0	Image out of focus, sea bed appears similar to previous image.

ER-O#1_47	08:19:27	509.3	Coarse sandy sea bed with pebbles and cobbles (21%). The cobbles and pebbles have a thin covering of sand making identification of encrusting species difficult. However, a single solitary coral polyp (Caryophyllid) is clearly visible together with at least three morphospecies of encrusting sponge. Encrusting bryozoans, serpulid worm tubes and other encrusting species are also present.
ER-O#1_48	08:23:01	510.8	Coarse sandy sea bed with pebbles (9%). Few visible fauna. An undetermined number of small ophiuroids (<10, possibly *Ophiactis* sp) are hidden within the cracks and crevices of what appears to be a heavily sponge encrusted cobble. Encrusting sponges and bryozoans are also present on the larger pebbles.
ER-O#1_49	08:26:10	513.0	Image out of focus, sea bed appears similar to previous image.
ER-O#1_50	08:26:30	514.0	Coarse sandy sea bed largely covered with pebbles, cobbles and boulders (53%). An asteroid (*Porania pulvillus*) is associated with an erect pale yellow, globose sponge. Spines of the echinoid *Cidaris cidaris* can just be seen behind the sponge with a Munida (probably *M. rugosa*) hiding underneath the boulder directly below. The claws of a second squat lobster (probably *Munida rugosa*) are visible beneath another cobble. An undetermined number of small ophiuroids (<100, possibly *Ophiactis* sp) are hidden within the cracks and crevices of what appear to be heavily sponge encrusted and/or porous boulders and cobbles. At least 3 morphospecies of encrusting sponge are visible. Other visible fauna include a scale worm (Polynoidae), encrusting bryozoans, serpulid worm tubes, small white unidentified encrusting organisms and other encrusting organisms
ER-O#1_51	08:28:32	516.0	Coarse sandy sea bed with pebbles and cobbles (23%). A number of faecal casts are evident. The holothurian *Stichopus tremulus* is visible just out of shot. The claws of two squat lobsters (probably *Munida rugosa*) are visible from beneath cobbles. An undetermined number of small ophiuroids (<100, possibly *Ophiactis* sp) are hidden within the cracks and crevices of what appear to be heavily sponge encrusted cobbles. Serpulid worm tubes, at least two morphospecies of encrusting sponges, bryozoans and hydroids are also visible.
ER-O#1_52	08:30:21	518.0	Coarse sandy sea bed largely covered with cobbles and boulders (74%). A large white erect lobose sponge is the most conspicuous faunal element of this image. An undetermined number of small ophiuroids (>100, possibly *Ophiactis* sp) are hidden within the cracks and crevices of the boulder on which the sponge sits. Two squat lobsters are also visible (probably *Munida rugosa*) as well as encrusting sponge, bryozoans, and other unidentified encrusting organisms.

ER-O#1_53	08:32:26	520.8	Coarse sandy sea bed largely covered with pebbles, cobbles and boulders (74%). Two *Cidaris cidaris* echinoids are visible, one sited close to a large pale yellow, erect, globose sponge. Also near the sponge are a number (10) of tube structures and a palaemonid shrimp. Within the cracks and crevices of the large boulder are an undetermined number of small ophiuroids (<20, possibly *Ophiactis* sp). Encrusting sponges, bryozoans and others encrusting organisms are also present.
ER-O#1_54	08:33:56	523.3	Image out of focus, not used.
ER-O#1_55	08:34:42	522.5	Coarse sandy sea bed with pebbles and cobbles (10%). A large asteroid (*Pseudarchaster* sp) is visible. In addition an undetermined number of small ophiuroids (<20, possibly *Ophiactis* sp) are visible although are largely hidden in what appears to be a sand coloured encrusting sponge. Encrusting sponges, bryozoans and other encrusting forms are also present on larger pebbles and cobbles.
ER-O#1_56	08:38:12	528.0	Medium to coarse sandy sea bed, possibly a fine covering over hard substratum beneath. No visible fauna except signs of encrusting organisms on buried hard substrata.
ER-O#1_57	08:39:32	531.5	Coarse sandy sea bed with pebbles and cobbles (23%). Two squat lobsters (probably *Munida rugosa*) are visible together with an unidentified ophiuroid, serpulid worm tubes, encrusting sponges, bryozoans and other unidentified encrusting forms. An undetermined number of small ophiuroids (<50, possibly *Ophiactis* sp) are visible, although are largely hidden in the cracks and crevices of the cobbles.
ER-O#1_58	08:41:00	539.3	Coarse sandy sea bed with cobbles (30%). An echinoid (*Cidaris cidaris*) is the most conspicuous faunal element of this image. It is situated on top of a cobble encrusted with sponges, bryozoans, serpulid worm tubes and other unidentified encrusting forms. One of the cobbles is covered by a thin layer of sand making identification of encrusting species difficult, although it too appears to have a number of attached or encrusting species including hydroids. Two squat lobsters (*Munida rugosa*) are concealed among the cobbles, and an undetermined number of small ophiuroids (<50, possibly *Ophiactis* sp) are visible, although are largely hidden in the cracks and crevices of the cobbles.
ER-O#1_59	08:43:55	545.0	Repeat of 58.
ER-O#1_60	08:44:29	545.3	Coarse sandy sea bed with pebbles (4%). No visible fauna.
ER-O#1_61	08:46:21	549.3	Coarse sandy sea bed with pebbles (8%). Few visible fauna. An echinoid *Cidaris cidaris* and a brachiopod are visible. Serpulid worm tubes, encrusting sponges and bryozoans are present on the larger pebbles.
ER-O#1_62	08:47:42	549.3	Coarse sandy sea bed with organic debris (*Cidaris* spine and brachiopod shells) and pebbles (7%). Few visible fauna except a small number of small ophiuroids (<10, possibly *Ophiactis* sp) with arms protruding from crevices in a pebble. Small growths of encrusting bryozoans are present on some of the larger pebbles.

ER-O#1_63	08:48:55	551.3	Image out of focus, sea bed similar to 65.
ER-O#1_64	08:50:24	550.0	Image out of focus, sea bed similar to 65.
ER-O#1_65	08:52:29	554.8	Coarse sandy sea bed with pebbles (6%). The remains of a dead *Cidaris cidaris* echinoid are visible in the top left corner of the image. Other visible fauna are encrusting sponges, including a conspicuous blue form, and bryozoans both present on the pebbles.
ER-O#1_66	08:54:26	557.0	Coarse sandy sea bed with organic debris including coral remains (4%), pebbles and cobbles (37%). A yellow, erect, globose sponge is a conspicuous faunal element of this image with at least 2 morphospecies of encrusting sponges also present. A flattened spherical structure in the centre of the image may also be another species of globose form sponge. Encrusting bryozoans, unidentified small white encrusting organisms and other encrusting species are also visible. A small number of small ophiuroids (<10, possibly *Ophiactis* sp) are hidden among the crevices in the cobbles, with two squat lobsters (probably *Munida rugosa*) concealed beneath the cobbles. Hydroids are visible on some of the cobbles.
ER-O#1_67	08:54:56	556.5	Coarse sandy sea bed with bedrock outcrop (or possibly a boulder) (31%). A squat lobster (probably *Munida rugosa*) is the most prominent faunal element of this image. Very near Munida, the tentacles of a Terebellid polychaete worm are visible. All cracks in the bedrock appear orange and are full of individuals of a small ophiuroid (>100, possibly *Ophiactis* sp) with arms extended into the water column. The bed rock itself is encrusted with sponges, bryozoans, small white unidentified encrusting organisms and other unidentified encrusting forms. Serpulid worm tubes, a brachiopod and a scallop species are also visible. Two small examples of the echinoid *Cidaris cidaris* are also present and in the bottom left of the image a solitary coral polyp (Caryophyllia) can be seen.
ER-O#1_68	08:56:10	559.5	Image out of focus, sea bed appears similar to 69.
ER-O#1_69	08:56:48	568.0	Coarse sandy sea bed with bedrock (or possible boulders) (85%). There are many encrusting and attached epifauna on the bedrock in this image which are unidentified. A growth of a pale yellow erect globose sponge is of note with at least 3 other morphspecies of encrusting sponge also present. These species together with encrusting bryozoans, a brachiopod, serpulid worm tubes, and many other unidentified encrusting and attached forms cover approximately 60% of the available exposed rock substratum. As with the previous image, cracks in the bedrock appear orange and are filled with individuals of a small ophiuroid species (>100, possible Ophiactis sp) with arms protruding into the water column. Two squat lobsters, probably *Munida rugosa* are visible.

ER-O#1_70	08:57:43	568.8	Coarse sandy sea bed with pebbles, cobbles and bedrock (34%) and some organic debris. As with the previous image there are many attached and encrusting forms that are unidentified. The most conspicuous species in this image is a relatively large growth of an erect branching sponge. At least five other species of sponge, both encrusting and globose forms, are present on the cobbles and bedrock. Two large pink anemones are present although are closed making identification difficult. Two possible solitary coral polyps (Caryophyllid), and many encrusting bryozoans and other encrusting species are all clearly visible associated with the hard substrata. As with the previous image cracks in the bedrock appear orange and are filled with individuals of a small ophiuroid species (>100, possible *Ophiactis* sp) with arms protruding into the water column. A single squat lobster, probably *Munida rugosa*, is visible.
ER-O#1_71	08:58:31	578.0	Bedrock (100%). The most conspicuous faunal elements of this image are patches of the coral *Lophelia pertusa* and growths of a yellow globose sponge form, both of which are attached to the bedrock substratum. A palaemonid shrimp and solitary coral polyp (Caryophyllia) are also of note. Encrusting sponges, bryozoans, small white unidentified encrusting organisms and others are also present.
ER-O#1_72	09:03:23	587.5	Coarse sandy sea bed with boulders (23%). A squat lobster (probably *Munida rugosa*) is visible within a crevice in a boulder. Globose and encrusting form sponges, bryozoans, and other unidentified encrusting species cover approximately 30% of the available exposed rock surface.
ER-O#1_73	09:04:30	598.5	Coarse sandy sea bed with pebbles, cobbles (14%) and some organic debris. Few visible fauna only serpulid worm tubes, encrusting sponges, bryozoans, small white unidentified encrusting species.
ER-O#1_74	09:05:40	606.7	Image at an oblique angle, species and habitat composition very similar to 69. A Synaphobranchid eel is visible,
ER-O#1_75	09:06:39	615.3	Very coarse sandy sea bed with pebbles (2%). Few visible fauna. On the far right of the image there seems to be an area of hard substratum just out of shot with encrusting species present.
ER-O#1_76	09:07:32	611.0	Image out of focus, sea bed appears similar to 75.
ER-O#1_77	09:09:35	619.8	Image out of focus, sea bed appears to be composed of pebbles and gravel on sand.
ER-O#1_78	09:11:02	638.8	Very coarse sandy and shell gravely sea bed with organic debris. No visible fauna.
ER-O#1_79	09:12:40	640.0	Coarse sandy and shell gravely sea bed. No visible fauna except for an echinoid (*Cidaris cidaris*),
ER-O#1_80	09:15:04	644.0	Poor image, sea bed appears similar to image 81. A large globose sponge and echinoid (*Cidaris cidaris*) are visible.
ER-O#1_81	09:15:32	647.0	Very coarse sandy sea bed largest covered with organic debris (*Cidaris* spines and brachiopod shells). No visible fauna.

ER-O#1_82	09:17:05	655.3	Coarse sandy sea bed with pebbles and cobbles (9%). Other than a slightly blurred object at the top right of the image, which may be a sea pen, there are no visible fauna.
ER-O#1_83	09:19:02	658.3	Coarse sandy sea bed with pebbles and cobbles (20%). Conspicuous species are a squat lobster (probably *Munida rugosa*), a single polyp of a solitary coral (Caryophyllids), and a large patch of white encrusting sponge. On closer inspection a number of small ophiuroids (<10 possible *Ophiactis* sp) are visible associated with a damaged patch of what appears to be sponge growth, and a gastropod mollusc is also visible attached to one of the cobbles. Serpulid worm tubes, other encrusting sponges, bryozoans, and other unidentified forms are also present.
ER-O#1_84	09:21:19	659.3	Coarse sandy sea bed with a cobble (3%). A growth of a large pale yellow, erect, globose sponge is attached to the cobble, with a small scallop species, encrusting sponge and bryozoans also associated with the cobble. Hydroids and a serpulid worm tube are also visible in close proximity to the cobble. An unidentified organism (polychaete or possibly small burrowing anemone) is the only organism present associated with the coarse sand habitat.
ER-O#1_85	09:22:38	658.0	Coarse sandy sea bed with pebbles and some organic debris (9%). Few visible fauna only the holothurian *Stichopus tremulus* and small growths of encrusting bryozoans on some of the larger pebbles.
ER-O#1_86	09:25:52	660.3	Coarse sandy sea bed almost entirely covered with pebbles (94%). Visible fauna are few, however two solitary coral polyps (Caryophyllid) are present, together with serpulid worm tubes, encrusting bryozoans and encrusting sponges.
ER-O#1_87	09:29:40	667.8	Coarse sandy sea bed with pebbles and a number of large cobbles (61%) and some organic debris. A rich faunal assemblage includes two squat lobsters (probably *Munida rugosa*) and a palaemonid shrimp that are partially concealed in cracks between the cobbles. Five solitary coral polyps (possibly Caryophyllids), a Caryophyllid, and nine brachiopods are attached to the various cobbles, with at least seven morphospecies of encrusting and globose sponges and an unidentified number of encrusting bryozoan species present. A serpulid worm tube and a single unidentified ophiuroid are also visible.
ER-O#1_88	09:31:09	672.0	Coarse sandy sea bed with many pebbles (37%). Few identifiable fauna, only two pencil echinoids (*Cidaris cidaris*) and small encrusting bryozoan and sponge colonies on some of the larger pebbles. An unidentified organism (possibly a polychaete worm) is visible in the bottom left corner of the image.
ER-O#1_89	09:32:45	673.0	Coarse sandy sea bed with many pebbles (31%). Few visible fauna only those typical of hard substrata. Serpulid worm tubes, encrusting sponges and bryozoans, and small white unidentified encrusting species.

ER-M #2, 17 August 2005: Total photos = 34, usable photos = 32

Photo	Time GMT	Depth m	Description
ER_M#2_01	17:37:17	399.8	Coarse sand, gravel, pebbles and cobbled sea bed. Few encrusting organisms on the cobbles, only encrusting bryozoans and serpulid worm tubes.
ER_M#2_02	17:38:43	400.8	Coarse sand, gravel, pebbles and cobbled sea bed. Few encrusting organisms on the cobbles, only encrusting bryozoans and serpulid worm tubes. Other fauna include an undetermined number of small ophiuroids (<10, possibly *Ophiactis* sp) hidden in the crevices of a cobble with only their arms protruding; the echinoid *Cidaris* sp, and two unidentified polychaete species.
ER_M#2_03	17:40:32	402.5	Repeat of 4.
ER_M#2_04	17:41:40	405.0	Unusual compacted / cemented sand sea bed. Few visible fauna except serpulid worm tubes and an undetermined number of small ophiuroids (>100, possibly *Ophiactis* sp) hidden within crevices in the sediment.
ER_M#2_05	17:42:46	406.5	Coarse sand, gravel, pebbles and cobbled sea bed. A single squat lobster (probably *M. rugosa*) can be seen hiding beneath a cobble. All other fauna are attached or encrusting forms including the solitary coral *Caryophyllia* sp (2 individuals), and encrusting bryozoans. Serpulid worm tubes are also present.
ER_M#2_06	17:43:49	404.0	Image out of focus. Coarse sand, gravel, pebbles and cobbled sea bed. Two echinoids (*Cidaris cidaris*) and encrusting fauna.
ER_M#2_07	17:45:59	407.5	Unusual compacted / cemented sand sea bed with a covering of coarse sand and gravel bordering an area of continuous cobble seabed (35%). Unusual compacted / cemented sand sea bed harbours an undetermined number of small ophiuroid species (<10, possibly *Ophiactis* sp) and a Munida (*M. rugosa*) within the crevices of the substratum. Three more Munida are visible within the cobble area, hiding among the cobbles. Attached to the cobbles are serpulid worm tubes, solitary corals (*Caryophyllia* sp), an erect branching bryozoan (Exidmonea probably *E. atlantica*) and encrusting sponges.
ER_M#2_08	17:48:36	409.0	Coarse sand, gravel and shell gravely sea bed. No fauna visible.
ER_M#2_09	17:49:26	410.0	Poor image, sea bed appears composed of coarse sand, gravel, shell gravel, pebbles and cobbles.
ER_M#2_10	17:50:39	411.8	Coarse sand, gravel, shell gravel, pebble and cobbled sea bed with organic debris (brachiopod shells and cidaris spines). Visible fauna consist of serpulid worm tubes, encrusting bryozoans and sponges, and small ophiuroids (possibly *Ophiactis* sp) present in the crevices of cobbles. A dead caryophyllid is visible.

ER_M#2_11	17:53:55	417.8	Unusual sandy sea bed with the appearance of an area of sediment deposition. Organic debris (brachiopod shells and *Cidaris* spines). Unusual sea bed harbours an indeterminable number of small ophiuroids (>100, possibly *Ophiactis* sp) and two Munida (possibly *M. rugosa*) within the crevices of the substratum. Unidentified hydroids form dense patches on the sediment surface and two ophiuroids (indet.) are also present. Sponges and bryozoans encrust small pebbles and shells. Other encrusting organisms are visible on a cobble in the far right corner of the image but cannot be identified.
ER_M#2_12	17:57:06	423.5	Image out of focus, appears very similar to 11.
ER_M#2_13	18:02:51	456.3	Coarse sand, cobble and boulder sea bed with organic debris (*Cidaris* spines, brachiopod shells and stylasterid fragments) bordering an area of unusual compacted / cemented sand sea bed. Unusual sea bed harbours an undetermined number of small ophiuroids (>100, possibly *Ophiactis* sp) and Munida (possibly *M. rugosa*) within the crevices of the substratum. Unidentified hydroids form dense patches on the sediment surface. The boulders and cobbles are encrusted with bryozoans, sponges, hydroids and other unidentified species including one large ascidian. In the bottom left and top right of the image, stylasterid coral growths are visible.
ER_M#2_14	18:03:21	461.0	Coarse sand, shell gravel, cobble and boulder (8%) sea bed with organic debris (brachiopod shells, cidaris spines, echinoid test). Munida (probably *M. rugosa*) and small ophiuroids (<10, possibly *Ophiactis* sp) can be seen within crevices in the sand. All other fauna is attached to the cobble and includes hydroids, serpulid worm tubes, encrusting sponges and bryozoans and an erect branching sponge.
ER_M#2_15	18:04:25	464.3	Unusual sandy sea bed with the appearance of an area of sediment deposition. Organic debris (brachiopod shells and cidaris spines). Unusual sea bed harbours an indeterminable number of small ophiuroids (>100, possibly *Ophiactis* sp) and Munida (probably *M. rugosa*). Serpulid worm tubes are also present. In the top right of the image a number of small globose sponges are visible. Encrusting sponges can be seen on some of the pebbles.
ER_M#2_16	18:16:40	482.3	Coarse sand, shell gravel and pebbly sea bed with organic debris (brachiopod shells and cidaris spines). Mobile epifauna include the echinoid *Cidaris cidaris* and an unidentified decapod (possibly *Ebalia* sp). Attached fauna include serpulid worm tubes and encrusting sponges and bryozoans.
ER_M#2_17	18:22:41	529.3	Dead *Lophelia pertusa* with *Reteporella* sp, small ophiuroids (possibly *Ophiactis* sp), encrusting sponges and hydroid growth on dead frame work.

ER_M#2_18	18:26:56	552.0	Image out of focus, not used.
ER_M#2_19	18:32:52	567.8	Coarse sand, shell gravel, cobbles and boulder (5%) sea bed with some organic debris (brachiopod shells, cidaris spines, echinoid test). A single burrow is visible in the coarse sand. All visible fauna are attached or encrusting forms and include anemones, possible solitary corals (Caryophyllids?), a globose form sponge, and encrusting bryozoans and sponges. An unidentified organism is visible in the top left of the image.
ER_M#2_20	18:34:46	574.7	Coarse sand, shell gravel, cobbles and boulder (31%) sea bed with organic debris (brachiopod shells, cidaris spines, echinoid test, *Lophelia pertusa* fragments). The mobile epifauna are represented by the echinoid *Cidaris cidaris* and a small number of the small ophiuroid (<10, possible Ophiactis sp) sheltering in the crack between two cobbles. Attached fauna include brachiopods, an unusual globose form sponge, serpulid worm tubes and encrusting sponges and bryozoans. A number of other unidentified encrusting species are present.
ER_M#2_21	18:41:16	587.0	Coarse sand, shell gravel, cobble and boulder sea bed (30%) with organic debris (brachiopod shells, *Cidaris* spines). The most conspicuous faunal species is the burrowing anemone (Cerianthid) visible at the top of the image. All other fauna are sessile or encrusting on the boulders and cobbles and include brachiopods, hydroids, encrusting sponges and bryozoans, other unidentified encrusting species.
ER_M#2_22	18:43:36	599.8	Coarse sand, shell gravel, cobbled (48%) sea bed with organic debris (brachiopod shells, cidaris spines). Mobile epifauna include the echinoids *Cidaris cidaris* and *Cidaris* sp and the squat lobster Munida (probably *M. rugosa*). On the boulders and cobbles there are many attached and encrusting species. A large yellow erect bryozoan species is visible and a serpulid worm with feeding tentacles extended into the water column. Other species include possible solitary corals (caryophyllids) and encrusting sponge and bryozoan species. Other encrusting fauna are present but could not be identified.
ER_M#2_23	18:45:34	600.8	Coarse sand, shell gravel, cobbled (9%) sea bed with organic debris (brachiopod shells, cidaris spines). Ophiuroids are the most conspicuous epifauna with 2 individuals of the ophiuroid *Ophiopholis aculeata* and a small individual of an unidentified species. Serpulid worm tubes, encrusting bryozoans, sponges and other unidentified fauna inhabit the cobbles.
ER_M#2_24	18:48:52	608.0	Image out of focus, sea bed appears similar to the previous image.
ER_M#2_25	18:50:56	608.5	Image out of focus, sea bed appears similar to the previous image.

ER_M#2_26	18:51:50	613.0	Coarse sand and shell gravely sea bed with organic debris (brachiopod shells, cidaris spines) and the occasional cobble (6%). The only visible fauna are three ophiuroids (probably *Ophiopholis aculeata*) and encrusting sponges and bryozoans.
ER_M#2_27	18:52:44	614.5	Image out of focus, sea bed appears similar to the previous image
ER_M#2_28	18:54:53	614.3	Coarse sand, shell gravely, pebbly sea bed with organic debris (brachiopod shells, cidaris spines and a scallop shell) and the occasional cobble (7%). Conspicuous epifauna include an ophiuroid (probably *Ophiopholis aculeata*), and serpulid worm with tentacles extended into the water column. Other serpulid worm tubes and encrusting bryozoans and sponges colonise the pebbles and cobbles.
ER_M#2_29	18:55:18	615.5	Coarse sand, shell gravel, pebbly sea bed with organic debris (brachiopod shells, *cidaris* spines) and the occasional cobble (2%). An ophiuroid (indet.), serpulid worm tubes and encrusting sponges and bryozoans are the only visible fauna.
ER_M#2_30	18:56:15	615.8	Coarse sand, shell gravely, pebbly sea bed with organic debris (brachiopod shells, cidaris spines) and the occasional cobble (2%). Similar epifauna as previous images. The echinoid *Cidaris cidaris* and ophiuroids (probably *Ophiopholis aculeata*) constitute the mobile epifauna, with encrusting bryozoans and sponges on the pebbles and cobbles.
ER_M#2_31	18:58:33	617.5	Shell gravely sea bed with organic debris (brachiopod shells, cidaris spines) and the occasional pebble. Few visible fauna, only the echinoid *Cidaris cidaris* and some encrusting bryozoans on larger pebbles.
ER_M#2_32	18:59:25	618.0	Shell gravely sea bed with organic debris (brachiopod shells, cidaris spines) becoming more pebbly toward the top left of the image. Visible fauna much the same as previous images for this station including the ophiuroid (probably *Ophiopholis aculeata*), encrusting bryozoans, serpulid worm tubes and unidentified hydroids.
ER_M#2_33	19:00:43	619.5	Image out of focus, sea bed appears similar to the previous image
ER_M#2_34	19:01:06	619.8	Shell gravely sea bed with organic debris (brachiopod shells, cidaris spines) and occasional pebbles. Few visible fauna, only encrusting bryozoans on larger pebbles and unidentified hydroids.

ER-N #1, 19 August 2005: Total photos = 57, usable photos = 53

Photo	Time GMT	Depth m	Description
ER-N#1_01	17:12:16	406.0	Medium sandy sea bed with cobbles (17%). All visible fauna are attached or encrusting forms although cover is sparse. The solitary corals (*Caryophyllia* sp), a cup form sponge, encrusting bryozoans, sponges and other unidentified encrusting organisms can all be seen.
ER-N#1_02	17:13:38	406.3	Medium sandy sea bed with cobbles (21%). All visible fauna are attached or encrusting on the cobbles and include serpulid worm tubes, possibly solitary corals (Caryophyllids?), encrusting sponges, bryozoans, and other unidentified encrusting organisms, notably a number of small unidentified white encrusting organisms.
ER-N#1_03	17:15:18	407.5	Medium sandy sea bed with cobbles (19%). Mobile epifauna include the echinoid *Cidaris cidaris*. There are very few encrusting organisms present on the cobbles, only a single individual, possibly a solitary coral (Caryophyllids?) and a few small patches of encrusting bryozoans.
ER-N#1_04	17:18:21	409.3	Coarse sandy sea bed with some shell gravel and pebbles. Very few visible fauna only serpulid worm tubes and encrusting sponge and bryozoans on some of the pebbles.
ER-N#1_05	17:25:27	409.8	Medium sandy sea bed with cobbles (22%). All visible fauna are attached to the cobbles and are similar to the previous images with serpulid worm tubes, possible solitary corals (Caryophyllids?), and encrusting sponges and bryozoans. A number of small unidentified white encrusting organisms are visible on the rock surface.
ER-N#1_06	17:25:52	409.0	Medium sandy sea bed with cobbles (39%). A large asteroid (*Porania pulvillus*) is the most conspicuous faunal element in this image. Four Munida (probably *M. rugosa*) of varying sizes can be seen hiding among the cobbles. All other fauna are sessile or encrusting forms although, in general, the cobbles are sparsely covered. Serpulid worm tubes, possible solitary corals (Caryophyllids?), and encrusting sponges and bryozoans represent the attached forms, together with many individuals of a small encrusting white organism.
ER-N#1_07	17:27:01	410.0	Boulders on medium sandy sea bed. All fauna are encrusting and attached forms as with previous images. Only a small growth of the erect bryozoan *Reteporella* sp, some serpulid worm tubes and encrusting bryozoans and sponges are identifiable. Small unidentified white encrusting organisms pepper the rock surface.

ER-N#1_08	17:30:19	410.5	Medium sandy sea bed with some organic debris and cobbles (26%). All visible fauna are sessile or encrusting on the cobbles. As seen in previous images the fauna consists of serpulid worm tubes and encrusting sponges and bryozoans. A single individual of the solitary coral *Caryophyllia* sp is attached to a cobble. Small unidentified white encrusting organisms cover much of the cobble surface.
ER-N#1_09	17:35:41	413.7	Medium sandy sea bed with some organic debris (brachiopod shells and *Cidaris* spines), pebbles and cobbles (4%). Few visible fauna, only a single Munida (probably *M. rugosa*) under a cobble, serpulid worm tubes, encrusting bryozoans and sponges.
ER-N#1_10	17:43:34	419.8	Coarse sandy sea bed covered with organic debris (brachiopod shells and cidaris spines) and occasional pebbles and cobbles (3%). Only visible fauna are encrusting bryozoans and sponges and a serpulid worm tube.
ER-N#1_11	17:46:30	418.8	Coarse sandy sea bed with some organic debris (brachiopod shells and cidaris spines), pebbles and cobbles (24%). Mobile epifauna include the squat lobsters Munida (*M. rugosa*) and *Galathea* sp All other fauna are attached and encrusting forms and as with previous images include serpulid worm tubes (at least one of which is occupied), encrusting sponges and bryozoans, *Caryophyllia* spp, and small unidentified white encrusting organisms. Other unidentified encrusting fauna are also present.
ER-N#1_12	17:48:21	420.8	Medium sandy sea bed well covered with cobbles and boulders (65%). Fauna much the same as in previous images with Munida (probably *M. rugosa*) hiding between cobbles that are encrusted with serpulid worm tubes and encrusting sponge and bryozoans.
ER-N#1_13	17:52:27	422.8	Coarse sandy sea bed with some organic debris (brachiopod shells and *Cidaris* spines), pebbles and cobbles (11%). The fauna is sparse and much the same as previous images with serpulid worm tubes, encrusting sponges and bryozoans and small unidentified white encrusting organisms.
ER-N#1_14	17:59:39	428.3	Coarse sand and shell gravely sea bed with occasional cobbles (17%). The most conspicuous faunal element in this image is the large stylasterid coral growth. Behind the coral growth is the echinoid *Cidaris cidaris* and in the top right corner of the image a hermit crab (Paguridae) is visible. The fauna on the cobbles is typical of all cobbles within this tow, and consists of encrusting sponges and bryozoans, serpulid worm tubes and small unidentified white encrusting organisms.
ER-N#1_15	18:06:47	431.8	Coarse sandy sea bed with organic debris (brachiopod shells and cidaris spines) and occasional pebbles and cobbles (3%). Few visible fauna except encrusting bryozoans and sponges and globose form sponge.

ER-N#1_16	18:14:40	448.3	Coarse sandy sea bed with cobbles (24%). Conspicuous fauna in this image are the echinoid *Cidaris cidaris* and a large growth of an encrusting sand coloured sponge. Orange marks on the sponge are possibly individuals of a small ophiuroid that hides in crevices with only arms protruding (possibly *Ophiactis* sp). A small Munida (probably *M. rugosa*) is just visible under one of the sponge covered cobbles. A small solitary coral (possibly a Caryophyllid), and numerous small unidentified white encrusting organisms are present on other cobbles.
ER-N#1_17	18:16:52	446.3	Coarse sandy sea bed with organic debris (brachiopod shells and *Cidaris* spines) pebbles and cobbles (11%). All visible fauna are attached or encrusting forms, the most conspicuous of which is a large growth of an encrusting sand coloured sponge. Orange marks on the sponge are possibly individuals of a small ophiuroid that hides in crevices with only arms protruding (possibly *Ophiactis* sp). Other visible fauna include serpulid worm tubes and encrusting bryozoans and other sponges.
ER-N#1_18	18:20:07	450.3	Coarse sandy sea bed with some organic debris (brachiopod shells and *Cidaris* spines), pebbles and cobbles (12%). Fauna similar to that described from other images and includes the echinoid *Cidaris cidaris*, encrusting sponges and bryozoans, and serpulid worm tubes.
ER-N#1_19	18:21:11	454.3	Unusual sandy sea bed with the appearance of an area of sediment deposition. Organic debris (brachiopod shells and Cidaris spines) and the occasional pebble also make up the sea bed. The unusual sea bed harbours an undetermined number of small ophiuroids (<50, possibly *Ophiactis* sp) within the crevices of the substratum. Unidentified hydroids form dense patches on the sediment surface. Serpulid worm tubes and encrusting sponges are also visible.
ER-N#1_20	18:23:30	453.5	Coarse sandy sea bed with some organic debris (brachiopod shells and *Cidaris* spines), pebbles and cobbles (9%) bordering the previous unusual sea bed type, which is visible at the bottom of the image. The unusual sea bed harbours an undetermined number of small ophiuroids (<50, possibly *Ophiactis* sp) within the crevices of the substratum. In the lower right hand corner of the image a pale yellow flocculent mass is visible that may be a sponge. The remainder of the image (more usual sea bed) harbours a fauna more typical of other images within this tow including serpulid worm tubes, encrusting sponges and bryozoans and numerous small unidentified white encrusting organisms.
ER-N#1_21	18:53:54	548.3	Pockets of coarse sandy seabed and organic debris (brachiopod shells and *Cidaris* spines) among a largely cobble covered sea bed (63%). As in previous images the most conspicuous faunal element in this image is the large growth of an encrusting sand coloured sponge populated by small ophiuroids (<100, possibly *Ophiactis* sp) hidden within the crevices of the substratum. The same ophiuroid species is visible within cracks in a cobble in the left of the image. Other fauna include *Munida* sp, hiding beneath a cobble, and other encrusting sponges, bryozoans, and unidentified white encrusting organisms.

ER-N#1_22	18:56:14	548.8	Repeat of 23.
ER-N#1_23	18:57:13	545.8	Sea bed covered with shell gravel and organic debris (brachiopod shells and Cidaris spines) and frequent cobbles (27%). As in previous images the most conspicuous faunal element in this image is the large growth of an encrusting sand coloured sponge populated by small ophiuroids (<50, possibly *Ophiactis* sp) hidden within the crevices of the sponge. Other visible fauna include serpulid worm tubes, encrusting sponges, bryozoans, and unidentified white encrusting organisms.
ER-N#1_24	19:03:33	559.3	Sea bed covered in cobbles and pebbles (99%) with some organic debris. Abundant epifaunal growth on cobbles and pebbles much of it unidentified, however conspicuous forms include the encrusting sand coloured sponge populated by small ophiuroids (<50, possibly *Ophiactis* sp) hidden within the crevices of the sponge (type seen previously), a flat based sponge with erect lobed growth form, serpulid worm tubes, encrusting sponges and bryozoans, small unidentified white encrusting organisms and other unidentified forms.
ER-N#1_25	19:04:08	561.8	No image.
ER-N#1_26	19:04:58	561.3	Coarse sandy sea bed with some organic debris (brachiopod shells and cidaris spines), pebbles and cobbles (6%) and a boulder (30%). All visible fauna are encrusting or sessile forms and include a small growth of a stylasterid coral, serpulid worm tubes, possibly solitary coral (Caryophyllid), hydroids, encrusting sponges, bryozoans and other unidentified forms.
ER-N#1_27	19:05:41	561.5	Image out of focus, sea bed appears to be composed of coarse sandy sea bed with organic debris (brachiopod shells and cidaris spines) and occasional cobbles.
ER-N#1_28	19:05:49	561.5	Coarse sandy sea bed with organic debris (brachiopod shells and *Cidaris* spines) and occasional pebbles. Visible fauna include an undetermined number of small ophiuroids (<50, possibly *Ophiactis* sp) hidden within the crevices of a sponge encrusted cobble. Other fauna include encrusting sponges and bryozoans.
ER-N#1_29	19:07:14	562.0	Coarse sandy sea bed and frequent cobbles and a boulder (51%) with some organic debris (brachiopod shells and *Cidaris* spines). Very rich fauna present. An undetermined number of small ophiuroids (<100, possibly *Ophiactis* sp) hidden within the crevices of cobbles, boulders and unusual areas of sea bed are clearly visible. Other mobile epifauna include a juvenile asteroid (probably *Astropecten irregularis*) and an unidentified decapod. Encrusting faunal species include a serpulid worm (and a number of tubes), *Caryophyllia* spp, brachiopods, encrusting sponges, bryozoans and unidentified white encrusting organisms.

ER-N#1_30	19:09:51	565.5	Coarse sandy, shell gravely sea bed with organic debris (brachiopod shells and cidaris spines) and cobbles (21%). Rich faunal assemblage with typical elements including Munida, serpulid worm tubes, possible solitary corals (Caryophyllids), brachiopods, and encrusting sponge, bryozoans, small white unidentified encrusting species and other encrusting species. A small growth of sand coloured sponge with small ophiuroid inhabitants (<20, possibly *Ophiactis* sp) is visible in the centre bottom of the image. Other interesting visible fauna include the holothurian *Psolus* sp (possibly *P. squamatus*) and two unidentified decapod species.
ER-N#1_31	19:11:01	564.8	Coarse sandy sea bed largely covered with pebbles and cobbles (52%). Conspicuous fauna include the echinoid *Cidaris cidaris*, squat lobster Munida (probably *M. rugosa*) in typical hidden position, brachiopods, encrusting sponges and bryozoans, small white unidentified encrusting species and other encrusting species. A small patch of sand coloured sponge with ophiuroid inhabitants (<20, possibly *Ophiactis* sp) is visible just left of the centre of the image.
ER-N#1_32	19:12:11	565.0	Coarse sandy sea bed partially covered with pebbles and cobbles (33%) and organic debris (brachiopod shells and *Cidaris* spines). Conspicuous fauna include the echinoid *Cidaris cidaris* and a large red anemone. Other fauna are largely encrusting or attached and include serpulid worm tubes, brachiopods, encrusting sponges, bryozoans, small white unidentified encrusting species and other encrusting species. A single small ophiuroid of the type usually found (in this study) in large numbers hidden in crevices (possibly *Ophiactis* sp) is present.
ER-N#1_33	19:13:34	566.0	Seabed covered in organic debris (brachiopod shells and cidaris spines) and cobbles (2%). No visible fauna
ER-N#1_34	19:14:22	566.8	Shell gravely sea bed with organic debris (brachiopod shells and *Cidaris* spines) and occasional pebbles 2%. No visible fauna except encrusting bryozoans.
ER-N#1_35	19:15:33	567.5	Shell gravely sea bed with organic debris (brachiopod shells and *Cidaris* spines). No visible fauna
ER-N#1_36	19:15:48	567.3	Shell gravely sea bed with organic debris (brachiopod shells and Cidaris spines) and the odd pebble 1%. Conspicuous species are the echinoid *Cidaris cidaris* and a small growth of a Stylasterid coral. Other fauna include a serpulid worm (tentacles extended) and encrusting bryozoans and sponges.
ER-N#1_37	19:16:43	563.0	Image out of focus, not used.
ER-N#1_38	19:16:51	567.0	Coarse sand with exposed bedrock (59%). Large numbers of the small ophiuroid (>100 possibly *Ophiactis* sp) are wedged in cracks and crevices in the rock with only their arms protruding. Three individuals of a possible solitary coral (Caryophyllid) with tentacles extended are prominent faunal features of this image. In addition brachiopods, encrusting sponges, bryozoans, small white unidentified encrusting species and other encrusting species are also present. An unidentified crustacean is present in the top left of the image.

ER-N#1_39	19:17:59	562.0	Coarse sand, pebbly sea bed with cobbles (9%) and a boulder (29%). Most of the fauna are attached or encrusting except for a *Cidaris cidaris* just out of shot. Prominent faunal elements include a Stylasterid coral, serpulid worm tubes, brachiopods with encrusting sponges, bryozoans, small white unidentified encrusting species and other encrusting species also present on the large boulder and cobbles.
ER-N#1_40	19:19:19	563.0	Sea bed covered in dead *Lophelia pertusa* fragments as well as other organic debris with a small boulder in view (56%). Among the organic debris protruding arms of the small ophiuroid (possibly *Ophiactis* sp) are visible. All other visible fauna is associated with the boulder. The most prominent features are a Stylasterid coral that is partially encrusted by sponge and a large cream coloured globose form sponge. Other interesting features include a small pink anemone, three possible solitary corals (Caryophyllid), an unidentified echinoid, an attached scallop species and a serpulid worm with tentacles extended. Serpulid worm tubes, encrusting sponges, bryozoans, and other unidentified encrusting species are also present.
ER-N#1_41	19:21:49	563.8	Coarse sandy sea bed with some shell gravel and occasional pebbles. No visible fauna
ER-N#1_42	19:23:32	563.7	Coarse sandy sea bed with exposed bedrock (34%) and cobbles. A small clump of the coral *Madrepora oculata* is the most conspicuous faunal element of this image and appears to be growing attached to the bedrock. The bedrock is reasonably encrusted with sponges and bryozoans, and in the cracks and crevices of the bedrock an undetermined number of small ophiuroids (<100, possibly *Ophiactis* sp) are evident through their protruding arms. Many (32) burrowing anemones (Halcampidae or Edwardsiidae) are clustered within the coarse sand sea bed and on the far right of the image another species of burrowing anemone is also visible again likely to belong to the Halcampidae of Edwardsiidae.
ER-N#1_43	19:24:13	564.3	Coarse sandy sea bed with protruding bedrock (34%). In places the sea bed is covered with dead *Lophelia pertusa* fragments and other organic debris. The fauna is largely composed of encrusting bryozoans, sponges and other unidentified encrusting species with serpulid worm tubes also present. However, a small growth of a Stylasterid coral and an unidentified number of small ophiuroids visible as arms protruding from the cracks and crevices in the bedrock are also of note.
ER-N#1_44	19:25:05	564.8	No image.
ER-N#1_45	19:25:46	564.5	Coarse sandy seabed largely covered with old Lophelia pertusa rubble (94%). Few visible fauna only encrusting sponges and the protruding arms of an undetermined number of small ophiuroids (>100, possible *Ophiactis* sp) present within the coral rubble. An echinoid *Cidaris cidaris* is just out of shot.
ER-N#1_46	19:26:42	564.5	Image out of focus, sea bed appears similar to next image

ER-N#1_47	19:27:13	569.3	Coarse sandy pebbly seabed with cobbles (20%). All visible fauna are attached or encrusting forms, the most conspicuous of which is a small stylasterid coral growth and three individuals of a possible solitary coral (Caryophyllid). Other fauna include serpulid worm tubes, encrusting sponges, bryozoans, and other unidentified species. A small number of small ophiuroids (possibly *Ophiactis* sp) are present on the stylasterid and within old serpulid tubes.
ER-N#1_48	19:28:06	568.0	Sea bed covered in organic debris (brachiopod shells and *Cidaris* spines) with a few pebbles (2%). The only visible fauna are a *Cidaris cidaris* echinoid and a large number (<100) of small ophiuroids (possibly *Ophiactis* sp) concentrated in what may be a dead sponge or other organic matter (eg. bone, wood).
ER-N#1_49	19:28:59	570.3	Sea bed covered in organic debris (brachiopod shells and *Cidaris* spines) with the odd pebble (2%). The only visible fauna are a *Cidaris cidaris* echinoid and a small number (<10) of small ophiuroids (possibly Ophiactis sp) with arms protruding from within the organic debris.
ER-N#1_50	19:29:54	567.0	Image dark and out of focus, sea bed appears similar to image 6. Erect sponges, corals including *Madrepora oculata*, stylasterids and possibly *Lophelia pertusa*, and echinoids (*Cidaris cidaris*) are just visible.
ER-N#1_51	19:32:19	572.3	Coral debris (including dead fragments of *Lophelia pertusa* and *Desmophyllum* sp (99%)) with the odd and cobble (1%). Conspicuous fauna include a small growth of *Madrepora oculata*. Two Munida (probably *M. rugosa*) and a palaemonid shrimp are visible near the coral and the arms of many (>100) small ophiuroids (possibly *Ophiactis* sp) protrude from the coral rubble. An unidentified anemone and encrusting bryozoans are also present.
ER-N#1_52	19:33:42	570.3	Sea bed is covered in organic debris. Only visible fauna is a red cerianthid anemone.
ER-N#1_53	19:34:29	573.0	Sea bed covered in organic debris. Only visible fauna are a serpulid worm tube and the arms of a small number (<10) of a small ophiuroid species (possibly *Ophiactis* sp) that are protruding from the organic debris.
ER-N#1_54	19:38:19	577.0	Image dark and out of focus, sea bed appears similar to image 6. Erect sponges are just visible.
ER-N#1_55	19:39:56	577.8	Bedrock with a small pocket of medium sand. Visible fauna include the echinoid *Cidaris cidaris*, squat lobsters Munida (probably *M. rugosa*), a small growth of the coral *Madrepora oculata, Psolus* sp, *Stichastrella rosea*, serpulid worm tubes, orange burrowing anemone, possible solitary corals (Caryophyllids), encrusting bryozoans and sponges and ophiuroids.
ER-N#1_56	19:46:39	621.5	Image out of focus, sea bed appears similar to previous image.
ER-N#1_57	19:46:56	607.0	Image out of focus, sea bed appears similar to previous image.

ER-B #1, 20 August 2005: Total photos = 22, usable photos = 20

Photo	Time GMT	Depth m	Description
ER-B#1_01	19:47:23	554.0	No image
ER-B#1_02	19:47:55	551.8	Coarse sand, gravel and pebbly sea bed. Visible species include the echinoid (*Cidaris cidaris*) and three squat lobsters (Munida, probably *M. rugosa*). Pebbles are encrusted with unidentified sponges, bryozoans and other unclassified organisms, with a Serpulid worm tube and patch of unidentified hydroid visible.
ER-B#1_03	19:48:36	551.3	Coarse sand, gravel and pebbly sea bed. No visible mobile epifauna. Pebbles are encrusted with unidentified sponges, bryozoans and other unclassified organisms, with a serpulid worm tube and patch of unidentified hydroid visible.
ER-B#1_04	19:49:30	550.3	Coarse sand, gravel and pebbly sea bed with the odd cobble (14%). Visible species include an undetermined number of ophiuroids (<10, possibly *Ophiactis* sp) hiding in the crevices of what appears to be a sponge covered cobble. All other visible fauna are attached or encrusting species and include a scallop, brachiopods, a pale yellow massive-globose form sponge, unidentified encrusting sponge and bryozoan species. Five serpulid worm tubes are visible.
ER-B#1_05	19:50:46	552.5	Coarse sand, gravel and pebbly sea bed with the odd cobble (30%). Visible species include solitary corals (*Caryophyllia* sp), serpulid worm tubes, a single gastropod mollusc, patches of unidentified hydroid species, a brachiopod, and other unidentified encrusting sponges and bryozoans.
ER-B#1_06	19:51:40	555.2	Coarse sand, gravel, pebble and cobble (60%) sea bed. Mobile epifauna include two Munida (probably *M. rugosa*) concealed beneath the cobbles with only claws visible; and an undetermined number of ophiuroids (<10, possibly *Ophiactis* sp) hiding in the crevices of what appears to be sponge covered cobbles. All other fauna are sessile or encrusting and include a single anemone, a brachiopod, unidentified hydroids, encrusting sponge, bryozoan and other unidentified fauna. Serpulid worm tubes and whole bivalve shells are also visible and may contain individuals.
ER-B#1_07	19:52:53	554.5	Shell gravel and pebbly (9%) sea bed. Mobile epifauna include an undetermined number of ophiuroids (<50, possibly *Ophiactis* sp) hiding in the crevices of a sponge covered cobble. All other fauna are sessile or encrusting and include unidentified hydroids, encrusting sponges, bryozoans and other unidentified fauna. Three serpulid worm tubes are visible and may contain individuals.

ER-B#1_08	19:53:19	555.3	Coarse sand, gravel and pebbly sea bed (22%) and some organic debris (cidaris spines, brachiopod shells and scallop shells). Visible mobile epifauna include one *Munida* sp (*M. rugosa*?), (claws only can be seen to the far left of shot), and an unidentified polyplacophoran. Other fauna is sessile or encrusting on pebbles and includes possible caryophyllids, brachiopods, encrusting bryozoans and sponges, serpulid worm tubes.
ER-B#1_09	19:54:43	556.8	Coarse sand, gravel, shell gravel and pebbly sea bed (10%). Mobile epifauna include the pencil echinoid (*Cidaris cidaris*) and an undetermined number of small ophiuroid species (<20, possibly *Ophiactis* sp) hidden within cracks in a larger pebble with only their arms protruding. Visible holes in the sediment in the bottom half of the shot may be either polychaete tubes, bivalve siphons or burrow entrances. Other encrusting and sessile fauna include encrusting bryozoans and sponges.
ER-B#1_10	19:57:27	559.5	Coarse sand, gravel, shell gravel and pebbly sea bed (1%). Very few visible fauna except encrusting bryozoans.
ER-B#1_11	19:58:43	560.3	Coarse sand, gravel, shell gravel and pebbly sea bed (25%). Few visible fauna, only encrusting bryozoans and serpulid worm tubes.
ER-B#1_12	20:00:07	561.8	Image out of focus, not used
ER-B#1_13	20:01:27	566.0	Coarse sand, gravel, shell gravel and pebbly sea bed (16%). Mobile epifauna are represented by a single ophiuroid (probably *Ophiopholis aculeata*). All other fauna are encrusting (bryozoans and sponges) or sessile (serpulid tubes).
ER-B#1_14	20:01:44	563.5	Image out of focus, not used
ER-B#1_15	20:02:29	565.5	Coarse sand, gravel, shell gravel and pebbly seabed (27%). Few visible fauna only encrusting bryozoans and sponges. Sand constructed polychaete worm tubes are visible on some pebbles although they may not be occupied.
ER-B#1_16	20:04:04	569.0	Coarse sand, gravel, shell gravel and pebbly sea bed (7%). Few visible fauna except encrusting bryozoans and sponges. Serpulid worm tubes are also visible.
ER-B#1_17	20:05:17	567.7	Coarse sand, gravel, shell gravel and pebbly sea bed (19%). Mobile epifauna are represented by the pencil echinoid (*Cidaris cidaris*), all other fauna are encrusting or sessile forms including unidentified hydroids, encrusting bryozoans and sponges. Serpulid worm tubes are also visible.
ER-B#1_18	20:06:52	571.5	Coarse sand, gravel, shell gravel and pebbly sea bed (8%). Few visible fauna except encrusting bryozoans and sponges, and unidentified hydroids. Serpulid worm tubes are also visible. Other unidentified encrusting fauna are present.

ER-B#1_19	20:10:44	574.8	Coarse sand, gravel, shell gravel and pebbly sea bed (9%). Few visible fauna except encrusting bryozoans and sponges, and serpulid worm tubes. Other unidentified encrusting fauna are present. A hole in the sediment in the centre of the image is most likely a polychaete worm tube or bivalve siphon.
ER-B#1_20	20:11:28	576.5	Coarse sand, gravel, shell gravel and pebbly sea bed (8%). A single ophiuroid (probably *Ophiopholis aculeata*) represents the mobile epifauna. Few other fauna are visible except encrusting bryozoans, sponges and serpulid worm tubes. Other unidentified encrusting fauna are present.
ER-B#1_21	20:14:18	579.3	Coarse sand, gravel, shell gravel and pebbly sea bed (5%). Few visible fauna except encrusting sponges and bryozoans, and unidentified hydroids.
ER-B#1_22	20:15:37	580.8	Coarse sand, gravel, shell gravel and pebbly sea bed (1%). A blurred line at the top of the image may be a sea pen. Very few visible fauna accept a single anemone, brachiopods and encrusting bryozoans and sponges. A polychaete tube / bivalve siphon is also visible.

ER-C #1, 20 August 2005: Total photos = 13, usable photos = 13

Photo	Time GMT	Depth m	Description
ER-C#1_01	00:10:21	646.8	Coarse sand sea bed with a few lumps of clinker, no signs of bioturbation. No visible fauna.
ER-C#1_02	00:15:22	648.0	Coarse sand sea bed with a small amount of clinker, no signs of bioturbation. A serpulid worm tube is the only visible faunal indicator.
ER-C#1_03	00:17:06	649.5	Coarse sand sea bed on the edge of an area of gravel, cobbled pebbly sea bed (9%). On the sand area visible fauna include an ophiuroid (indet.) and an unidentified asteroid. All other fauna is present on the cobbled area of sea bed. The pencil echinoid (*Cidaris cidaris*) and sessile forms including possible caryophyllids?, encrusting bryozoans and sponges, and anemones are present. Serpulid worm tubes are also visible.
ER-C#1_04	00:18:55	649.0	Coarse sand seabed with no signs of bioturbation. *Cidaris cidaris* and an ophiuroid (indet.) represent the mobile epifauna. Encrusting sponges are present on a single largely sand covered pebble.
ER-C#1_05	00:21:15	650.5	Coarse sand sea bed with a small amount of clinker, no signs of bioturbation. No visible fauna.
ER-C#1_06	00:23:56	652.0	Coarse sand sea bed with some clinker, no signs of bioturbation. Few visible fauna, only the pencil echinoid *Cidaris cidaris*,
ER-C#1_07	00:24:53	651.0	Coarse sand seabed with some clinker and the odd cobble (5%), no signs of bioturbation. All visible fauna are attached to cobble and includes serpulid worm tubes, hydroids, encrusting sponges, bryozoans, and other unidentified fauna.
ER-C#1_08	00:29:15	652.8	Coarse sand sea bed with some clinker and occasional pebbles. No signs of bioturbation. Fauna include *Astropecten irregularis*, ophiuroids (indet.), solitary corals (*Caryophyllia* spp), and encrusting bryozoans and sponges on the pebbles.
ER-C#1_09	00:31:27	653.0	Coarse sand seabed with clinker and the odd cobble (4%), no signs of bioturbation. All visible fauna are sessile or encrusting on the cobble and include serpulid worm tubes and encrusting sponge species. Other unidentifiable encrusting fauna are also present.
ER-C#1_10	00:34:53	653.3	Coarse sand sea bed with clinker, no signs of bioturbation. Visible fauna include the asteroid *Astropecten irregularis*, a polychaete worm with tentacles extended into the water column, and an encrusting sponge.
ER-C#1_11	00:36:21	655.3	Coarse sand sea bed with some clinker and the odd cobble (1%), no signs of bioturbation. Few visible fauna include an ophiuroid (indet.) and encrusting bryozoans on the cobble.

ER-C#1_12	00:38:42	655.0	Coarse sand seabed with occasional pebbles (2%), no signs of bioturbation. No visible fauna except for encrusting bryozoans on the pebbles.
ER-C#1_13	00:39:32	654.3	Coarse sand sea bed with no signs of bioturbation. Only visible fauna is a brachiopod attached to a small granule.

ER-D#1, 21 August 2005: Total photos = 17, usable photos = 16

Photo	Time GMT	Depth m	Description
ER-D#1_01	03:39:12	731.8	Coarse sand sea bed with clinker and some detritus. No visible fauna.
ER-D#1_02	03:43:26	733.3	Coarse sand sea bed with clinker and some detritus. No visible fauna.
ER-D#1_03	03:46:29	733.5	Medium sand sea bed with clinker, pebbles, a cobble and fragments of dead *Lophelia pertusa* and dead Caryophyllids. There is a fine layer of sand deposited on the cobble obscuring the view of encrusting species. However two anemones and a serpulid worm tube are visible. Other encrusting fauna are present but could not be identified.
ER-D#1_04	03:47:33	734.8	Medium sandy sea bed with clinker, pebbles and a boulder (11%) and small fragments of dead *Lophelia pertusa*. Few visible fauna on the sand only the ophiuroid (possibly *Ophiactis* sp). All other fauna is encrusting or attached and includes serpulid worm tubes, possible caryophyllids, encrusting sponges and other unidentified encrusting species.
ER-D#1_05	03:50:35	735.0	Coarse sand sea bed with clinker, pebbles and some detritus. Few visible fauna, only an unidentified bivalve in lower right corner of the shot.
ER-D#1_06	03:51:20	733.5	Coarse sand sea bed with few pebbles and the odd cobble (2%). All visible fauna is attached or encrusting on the cobble and includes encrusting sponges, and the erect bryozoan *Reteporella* sp. Other encrusting species are present but could not be identified.
ER-D#1_07	03:53:09	734.5	Image obscured by sediment clouds, suggesting the seabed consists of mediums sand.
ER-D#1_08	03:53:22	734.8	Coarse sand sea bed with pebbles and the odd cobble (5%). All visible fauna is attached or encrusting on the cobbles and includes encrusting and massive-globose sponge forms. Other unidentified encrusting fauna are present.
ER-D#1_09	03:55:28	733.3	No image.
ER-D#1_10	03:56:44	734.8	Coarse sand sea bed with clinker, pebbles and some detritus. Few visible fauna, only encrusting bryozoans on the pebbles.
ER-D#1_11	03:58:42	735.8	Coarse sand sea bed with the odd pebble. No visible fauna.
ER-D#1_12	03:59:52	736.0	Coarse sand sea bed with the odd pebble (1%) and some detritus. One juvenile asteroid can be seen (probably *Astropecten irregularis*) and encrusting sponges on the pebbles.
ER-D#1_13	04:00:54	736.0	Coarse sand sea bed with pebbles and the odd cobble (7%). Type 3 ripples visible. All visible fauna is attached to or encrusting on the cobble and includes encrusting sponge species and a brachiopod. Other unidentified encrusting species are also present.

ER-D#1_14	04:04:07	735.5	Coarse sand sea bed with the odd pebble (1%) and some detritus. Encrusting bryozoans on pebbles.
ER-D#1_15	04:06:46	735.5	Coarse sand sea bed with the odd pebble (1%). No visible fauna.
ER-D#1_16	04:08:33	736.3	Image partially obscured by sediment clouds, sea bed appears to be composed of coarse sand.
ER-D#1_17	04:08:38	736.5	Coarse sand sea bed with the odd pebble (1%). No visible fauna except encrusting bryozoans on the pebbles.

ER-F #1, 17August 2005: Total photos = 37, usable photos = 32

Photo	Time GMT	Depth m	Description
ER_F#1_03	08:04:29	1029.5	Image at an oblique angle, not used.
ER_F#1_05	08:06:06	1029.0	Medium to fine muddy sand sea bed with occasional gravel. Visible fauna includes what appears to be either the sponge *Pheronema carpenteri* or a dead Xenophyophore with epifaunal tufted growths.
ER_F#1_09	08:10:00	1028.7	Medium to fine muddy sand sea bed with occasional gravel pieces. Small growths of the corals *Lophelia pertusa* and *Madrepora occulata* are present and an individual of the solitary coral *Desmophyllum* sp can also be seen as part of a structure on the right of the image. Other fauna include a large anemone (possibly *Bolocera tuediae*) and the echinoid *Cidaris* sp as well as ophiuroids (possibly *Ophiactis* sp).
ER_F#1_10	08:10:38	1028.7	Repeat of 9.
ER_F#1_11	08:14:06	1028.5	Medium to fine muddy sand sea bed with the odd pebble. Visible fauna include an unidentified ophiuroid and an anemone (possibly *Bolocera tuediae*, although image is obscured by sediment cloud).
ER_F#1_14	08:17:00	1028.2	Medium muddy sand sea bed with some gravel, pebbles and the occasional cobble 2%. Encrusting bryozoans on pebbles. Some of the image obscured by sediment clouds.
ER_F#1_16	08:17:55	1028.2	Poor image, sea bed appears to be medium sand.
ER_F#1_17	08:18:47	1027.5	Poor image, not used.
ER_F#1_20	08:22:54	1027.5	Fine muddy sand seabed. Visible fauna includes what appears to be either the sponge *Pheronema carpenteri* or a dead Xenophyophore with epifaunal tufted growths.
ER_F#1_21	08:23:30	1027.0	Fine muddy sand sea bed with detritus and the occasional cobble 2%. Visible fauna include a Xenophyophore and encrusting sponges.
ER_F#1_23	08:24:37	1026.7	Fine muddy sand sea bed with detritus and the occasional cobble 3%. A small growth of the corals *Lophelia pertusa* and a stylasterid with unidentified hydroids provide a small structure to the right of the image. An unidentified gelatinous growth also forms part of this structure. Other visible fauna include a Xenophyophore and a solitary coral *Caryophyllia* sp. Other fauna are present but could not be identified from the image.
ER_F#1_24	08:25:42	1027.0	Fine muddy sand sea bed with detritus. Visible fauna includes what appears to be either the sponge *Pheronema carpenteri* or a dead Xenophyophore with epifaunal tufted growths. A single squat lobster (*Galathea* sp) is also clearly visible.

ER_F#1_25	08:25:53	1026.7	Repeat of 24.
ER_F#1_27	08:28:23	1025.7	Fine muddy sand sea bed. The only visible fauna is a dead Xenophyophore.
ER_F#1_28	08:29:39	1026.2	Fine muddy sand sea bed with some detritus. Dead solitary coral (*Caryophyllia* sp), no visible fauna.
ER_F#1_29	08:31:57	1027.0	Fine muddy sand sea bed with some detritus. Visible fauna includes what appears to be either a dead *Pheronema carpenteri* or a dead Xenophyophore with epifaunal tufted growths. Other fauna includes individuals of solitary coral *Caryophyllia* sp, and the squat lobster *Galathea* sp
ER_F#1_30	08:35:17	1025.8	Fine muddy sand sea bed with some detritus. No visible epifauna although a burrow opening provides evidence of infaunal activity.
ER_F#1_31	08:35:56	1025.7	Poor image, not used.
ER_F#1_32	08:38:15	1026.2	Fine muddy sand with occasional pieces of gravel. Image very cloudy as a result of previous sediment disturbance by the camera. No fauna visible.
ER_F#1_33	08:39:23	1025.5	Fine muddy sand sea bed with some detritus. Image very clouded as a result of previous sediment disturbance by the camera. Visible fauna includes the echinoid *Cidaris* sp and what appears to be either a dead *Pheronema carpenteri* or a dead Xenophyophore with epifaunal tufted growths. Other fauna are present but could not be identified as a result of the poor quality of the image.
ER_F#1_36	08:42:02	1025.5	Poor image, sea bed appears to be muddy sand.
ER_F#1_37	08:42:47	1025.0	Fine muddy sand sea bed with detritus and clinker. Encrusting sponge present on larger piece of clinker and a small orange organism (probably a Caryophyllid) is present in the sediment.

ER-L #1, 26 August 2005: Total photos = 12, usable photos = 12

Photo	Time GMT	Depth m	Description
ER_L#1_01	18:24:58	1124.7	Image at an oblique angle, sea bed appears to be muddy fine sand. Two possible echinoids are visible.
ER_L#1_02	18:25:40	1125.0	Poor image, sea bed appears to be fine muddy sand.
ER_L#1_03	18:26:01	1125.0	Image obscured by sediment clouds. Sea bed appears to be muddy.
ER_L#1_04	18:27:32	1127.7	Very fine muddy, silty sea bed. Some lebenspurren visible including 18 holes of various sizes in the sediment, most likely animal burrows. A number of tubes can also be seen both within and protruding from the sediment.
ER_L#1_05	18:29:30	1127.5	Poor image, sea bed appears to be fine muddy sediment.
ER_L#1_06	18:30:11	1125.7	Very fine muddy, silty sea bed. Some lebenspurren including 10 holes of various sizes in the sediment, most likely animal burrows. A number of tubes can also be seen both within and protruding from the sediment.
ER_L#1_07	18:30:21	1126.8	Very fine muddy, silty sea bed. Some lebenspurren including 13 holes of various sizes in the sediment, most likely animal burrows. A number of tubes can also be seen both within and protruding from the sediment.
ER_L#1_08	18:30:58	1126.2	Very fine muddy, silty sea bed. Some lebenspurren including 6 holes of various sizes in the sediment, most likely animal burrows. A number of tubes can also be seen both within and protruding from the sediment.
ER_L#1_09	18:31:56	1126.2	Image obscured by sediment clouds, sea bed appears to be fine muddy sediment.
ER_L#1_10	18:39:00	1127.2	Very fine muddy, silty sea bed with small clay lumps. Some lebenspurren including a number of tubes can also be seen both within and protruding from the sediment.
ER_L#1_11	18:40:28	1127.2	Image at an oblique angle, sea bed of fine muddy sediment.
ER_L#1_12	18:40:41	1127.0	Very fine muddy, silty sea bed. Some lebenspurren including 2 holes of various sizes in the sediment, most likely animal burrows. A number of tubes can also be seen both within and protruding from the sediment.

ER-G #1, 19August 2005: Total photos = 10, usable photos = 9

Photo	Time GMT	Depth m	Description
ER-G#1_01	21:55:19	1567.7	Fine mud sea bed with signs of faunal activity. No visible fauna.
ER-G#1_02	21:58:35	1547.7	Fine mud sea bed with signs of faunal activity. No visible fauna.
ER-G#1_03	22:00:15	1547.7	Fine mud sea bed with signs of faunal activity. No visible fauna.
ER-G#1_04	22:02:10	1548.3	Fine mud sea bed with signs of faunal activity. No visible fauna.
ER-G#1_05	22:03:48	1548.7	Image obscured by sediment clouds, not used.
ER-G#1_06	22:04:15	1549.5	Fine mud sea bed with signs of faunal activity and a single hole on the sediment, most likely an animal burrow. No visible fauna.
ER-G#1_07	22:07:02	1549.0	Fine mud sea bed with signs of faunal activity. No visible fauna.
ER-G#1_08	22:09:44	1549.0	Fine mud sea bed with signs of faunal activity. No visible fauna.
ER-G#1_09	22:12:03	1553.5	Fine mud sea bed with signs of faunal activity. Five holes in the sediment (burrows) in a line. No visible fauna.
ER-G#1_10	22:18:54	1552.3	Fine mud sea bed with signs of faunal activity. A single burrow opening. No visible fauna.

ER-E #4, 20August 2005: Total photos = 4, usable photos = 2

Photo	Time GMT	Depth m	Description
ER-E#4_01	16:38:42	1598.5	Fine mud sea bed with signs of faunal activity. Brisingid asteroid visible (possibly *Freyaster* sp)
ER-E#4_02	16:43:32	1599.5	Repeat of 4.
ER-E#4_03	16:43:54	1600.0	Repeat of 4.
ER-E#4_04	16:44:16	1599.0	Fine mud sea bed with a large solid structure present (39%), sediment shows signs of faunal activity with burrows visible. All visible fauna is attached to or encrusting on solid substratum and includes hydroids, encrusting sponges, and brachiopods. An undetermined number (<10) of ophiuroids (possibly *Ophiactis* sp) are hidden in crevices in the solid substratum, visible only by their protruding arms.

Appendix 3.2: Rockall Bank FRS/JNCC stations

COR0510, 8 September 2005: Total photos = 12, usable photos = 11

Photo	Time GMT	Depth m	Description
176Cnv00030-194829			Medium sandy sea bed with cobbles, pebbles and clinker. Image taken very high in the water column. As a result few fauna are visible except two asteroids probably (*Stichastrella rosea*) and three cup sponges (possibly *Phakellia* sp).
177Cnv00038-194835			Medium sandy sea bed with cobbles, pebbles and clinker. Image taken high in the water column. As a result few fauna are visible and those that are, are difficult to identify. Six growths of yellow erect-globose sponge, two asteroids, at least 12 cup sponges (most likely both *Phakellia* sp and *Axinella* sp), *Reteporella*, encrusting sponges, possible stylasterid coral or erect branching sponge, and a large possible sea spider or spider crab are all visible fauna. Other encrusting or attached fauna are present but cannot be identified.
178Cnv00037-194839			Medium sandy sea bed with cobbles, pebbles and clinker. Image taken high in the water column. As a result few fauna are visible and those that are, are difficult to identify. A bluemouth red fish (*Helicolenus dactylopterus*), two growths of yellow erect-globose sponge, at least three cup sponges (most likely both *Phakellia* sp and *Axinella* sp), *Reteporella*, encrusting sponges, possible stylasterid coral or erect branching sponge, and a large spider crab are all visible fauna. Serpulid worm tubes and other encrusting or attached fauna are present but cannot be identified.
179Cnv00036-194844			Medium sandy sea bed with cobbles, pebbles and clinker. Image taken very high in the water column. As a result few fauna are visible except a cup sponges (possibly *Phakellia* sp).
180Cnv00035-194850			Medium sandy sea bed with cobbles, pebbles and clinker. Image taken very high in the water column. As a result no fauna are visible.
181Cnv00034-195750	19:58:00	141.6	Medium sandy sea bed with some detritus. No signs of bioturbation although sediment surface appears grainy. No visible fauna.

182Cnv00033-195939	20:00:00	141.7	Medium to coarse sandy sea bed with bedrock outcrops 69%. The bedrock outcrop is dominated by cup form and encrusting sponge species, 13 cup sponges (both *Axinella* sp and *Phakellia* sp) and at least three encrusting forms are visible, as well as a small yellow globose form and a possible erect branching form (although this may be a Cyclostome bryozoan). *Reteporella* and cyclostome bryozoans are also present, and a single asteroid (*Stichastrella rosea*).
183Cnv00043-200006			Medium to coarse sandy sea bed with bedrock outcrops 27%. Image taken very high in the water column. As a result few fauna are visible except three cup sponges (possibly *Axinella* sp) and *Reteporella*.
184Cnv00042-200016			Medium to coarse sandy sea bed with bedrock outcrops 51%. Image is partially out of focus making identification difficult. The bedrock out crop is heavily encrusted with many different groups of epifauna including cup sponges (*Axinella* sp and *Phakellia* sp), at least four species of encrusting sponge, yellow globose sponge, Stylasterid coral (possibly two species although one may be a cyclostome bryozoan), *Reteporella* and cyclostome bryozoans, anemones and many other unidentified encrusting species. The asteroids *Henricia sanguinolenta* and *Luidia sarsi* are both present.
185Cnv00041-200025			Poor image, not used.
186Cnv00040-200049			Medium to coarse sandy sea bed with bedrock outcrops. Visible fauna are all attached forms and include eight cup sponges (possibly *Axinella* sp), encrusting sponges, hydroids and other unidentified encrusting forms.
187Cnv00039-200500	20:05:00	141.4	Medium to coarse sandy sea bed with clinker. No visible fauna.

COR05012, 8 September 2005: Total photos = 12, usable photos = 12

Photo	Time GMT	Depth m	Description
201Cnv00047-204056	22:41:00	146	Coarse sandy sea bed with bedrock outcrops 67%. Bedrock heavily encrusted. Many unidentified fauna. Eight cup sponges (*Axinella* sp and *Phakellia* sp), a white globose form sponge, many encrusting sponge forms, clusters of small anemones (possibly zoanthids), *Reteporella* and cyclostome bryozoans, are all visible. Also a single unidentified asteroid.
202Cnv00046-224343	22:44:00	144	Coarse sandy sea bed with bedrock outcrops 65%. Image taken high in the water column. As a result few fauna are visible and those that are, are difficult to identify. Visible fauna include *Reteporella*, erect and encrusting sponges, small clumps of anemones (possibly zoanthids) and the asteroid *Henricia*. Other encrusting or attached fauna are present but cannot be identified.
203Cnv00045-224509	22:45:00	145	Coarse sandy sea bed with bedrock outcrops 13%. Visible fauna include the asteroid *Stichastrella rosea*, encrusting sponges, possible hydroid turf and *Reteporella*.
204Cnv00044-224750	22:48:00	147	Coarse sandy sea bed with bedrock outcrops 16% and clinker. Visible fauna include the asteroids *Henricia* sp and *Stichastrella rosea*. A bright red encrusting sponge and possible hydroid turf are present as well as other unidentified encrusting species.
205Cnv00053-224928	22:49:00	146	Possible mega ripples of coarse sand and cobbles 16% with clinker. No visible fauna.
206Cnv00052-225147	22:52:00	146	Medium sandy sea bed with pebbles (7%). No visible fauna.
207Cnv00051-225737	22:58:00	147	Possible mega ripples of gravel/clinker and cobbles. Visible fauna include many serpulid worm tubes, the common whelk *Buccinum undatum*, and the asteroid *Asterias rubens*.
208Cnv00050-225809			Possible mega ripples? of gravel/clinker and cobbles. Image taken high in the water column, as a result only the asteroid *Stichastrella rosea* is visible.
209Cnv00049-225837	22:59:00	147	Medium to coarse sandy sea bed with some detritus. Possible type 4 ripples?.
210Cnv00048-230402	23:04:00	146	Very coarse sandy sea bed with clinker and shell debris. No visible fauna
211Cnv00059-230452	23:05:00	146	Coarse sandy sea bed with shell gravel. No visible fauna.
212Cnv00058-230808	23:08:00	145	Medium sandy sea bed. Possible type 4 ripples. No visible fauna.

COR0513, 9 September 2005: Total photos = 19, usable photos = 19

Photo	Time GMT	Depth m	Description
213Cnv00057-000820	00:08:20	154.6	Medium sandy sea bed with some detritus. No visible fauna.
214Cnv00056-001021	00:10:21	153.3	Medium sandy sea bed with some detritus. A gurnard is visible (*Eutrigla gurnardus*).
215Cnv00055-001109	00:11:09	153.7	Possible mega ripples. Coarse sand/clinker and gravel/pebbles in alternate bands. No visible fauna.
216Cnv00054-001307	00:13:07	154.5	Medium to coarse sandy sea bed with boulders 27%. Visible fauna include a cup sponge (*Axinella* sp), at least three encrusting sponge forms, *Reteporella* and cyclostome bryozoans, and a possible hydroid turf. Other unidentified encrusting forms are likely to be present.
217Cnv00065-001356	00:13:57	154.7	Coarse sandy sea bed with bedrock outcrops 52%. Visible fauna include two asteroids *Henricia sanguinolenta*?, a yellow globose sponge form, at least three encrusting sponge forms and four colonies of *Reteporella*. A hydroid turf covers much of the rock surface. Other unidentified encrusting forms are likely to be present.
218Cnv00064-001634	00:16:35	155	Coarse sandy seabed with bedrock outcrops. A bluemouth red fish (*Helicolenus dactylopterus*) and a cup sponge (*Axinella* sp) are visible fauna. A hydroid turf covers much of the rock surface. Other unidentified encrusting forms are likely to be present.
219Cnv00063-001721	00:17:21	154.3	Coarse sandy sea bed with bedrock outcrops. Image taken very high in the water column. As a result few fauna are visible and less identifiable. A large monk fish (*Lophius piscatorius*) is positioned between two rock outcrops. The rock outcrops are covered with a hydroid turf. It is likely that other encrusting organisms described in previous images within this station are present.
220Cnv00062-001749	00:17:49	154.6	Coarse sandy sea bed with bedrock outcrops 85%. Bedrock out crop is densely covered with encrusting and attached fauna. Visible mobile epifauna include a squat lobster (probably *Munida rugosa*) concealed beneath a cobble, three hermit crabs (*Paguridae*), a Palaemonid shrimp and the asteroid *Asterias rubens*. Attached or encrusting forms include 16 cup sponges (*Axinella* sp and *Phakellia* sp), a yellow globose sponge form, an erect sponge (possibly *Raspailia ramosa*), at least four encrusting sponge forms, two colonies of *Reteporella* and four colonies of cyclostome bryozoans. There are many small clustered anemones (possibly zoanthids), serpulid worm tubes, and many other unidentified attached forms including a large patch of hydroid growth.

221Cnv00061-001825	00:18:25	154	Shell gravel and coarse sandy sea bed with pebbles cobbles and boulders (20%). 20 squat lobsters (all probably *Munida rugosa*), a Palaemonid shrimp, two hermit crabs (*Paguridae*) and the asteroid *Stichastrella rosea* represent the mobile epifauna. Attached or encrusting on the cobbles and boulders are small white unidentified encrusting organisms, a large number of small clustered anemones (possibly zoanthids), serpulid worm tubes, cyclostome bryozoans, a cup sponge, encrusting sponges and other unidentified forms. A snake pipe fish (*Entelurus aequoraeus*) appears to have been caught by a Munida.
222Cnv00060-001843	00:18:43	154.5	Medium to coarse sandy sea bed with bedrock outcrops 57%. Visible fauna include two *Munida rugosa*, a large number of small clustered anemones (possibly zoanthids), two cup sponges (*Axinella* sp), encrusting sponge forms (yellow form present) and other unidentified encrusting species.
223Cnv00071-001927	00:19:27	155.1	Medium to coarse sandy sea bed with bedrock outcrops 13%. Bedrock is heavily encrusted with organisms including a yellow encrusting sponge, cyclostome bryozoans and a hydroid turf. Other attached forms are unidentified.
224Cnv00070-002123	00:21:23	153.8	Coarse sandy sea bed with pebbles and cobbles (10%). Visible fauna are associated with the cobbles and include *Reteporella*, a number of small anemones (possibly zoanthids), and a hydroid turf.
225Cnv00069-002446	00:24:47	154.6	Coarse sandy sea bed with pebbles (50%), compacted sediment. The only visible fauna is the asteroid *Stichastrella rosea*.
226Cnv00068-002520	00:25:21	153.8	Medium to coarse sandy sea bed with some detritus. Visible fauna include three asteroids, two *Asterina gibbsa* and one *Astropecten irregularis*.
227Cnv00067-002707	00:27:08	154.8	Medium to coarse sandy sea bed with some detritus. No visible fauna.
228Cnv00066-002928	00:29:28	154.4	Coarse sandy sea bed with pebbles (3%) and shell gravel. No visible fauna.
229Cnv00075-003110	00:31:10	155	Medium to coarse clean sandy sea bed. Type 4 ripples and a burrow opening are visible.
230Cnv00074-003307	00:33:08	154.6	Medium to coarse sandy sea bed with some detritus. The only visible fauna is a small anemone.
231Cnv00073-003353	00:33:54	154.2	Medium to coarse sandy sea bed with some detritus. The only visible fauna is an ophiuroid (possibly *Ophiopholis aculeata*).

COR0514, 9 September 2005: Total photos = 6, usable photos = 6

Photo	Time GMT	Depth m	Description
234Cnv00072-012050	01:20:51	157.1	Coarse sandy sea bed with pebbles (7%). No visible fauna
235CNV00080-012303	01:23:03	158.5	Coarse sandy sea bed with pebbles (8%). The only visible fauna is a hermit crab (Paguridae).
236Cnv00079-012522	01:25:21	157.6	Coarse sandy sea bed with pebbles (32%), well packed. Visible fauna include a flatfish (Lemon sole-*Microstomus kitt*?)
237Cnv00078-012729	01:27:29	157.2	Medium to coarse sandy sea bed with pebbles (1%) and very fine ripples (type 2). No visible fauna.
238Cnv00077-012933	01:29:33	157.7	Coarse sandy sea bed with pebbles (17%), some detritus. A small purple organism is present in this image but cannot be identified as it is too distant.
239Cnv00076-013226	01:32:26	158.4	Coarse sandy sea bed with pebbles (34%) well packed. Two asteroids *Hippasteria phrygiana* and *Luidia ciliaris* are visible in this image.

COR0515, 9 September 2005: Total photos = 14, usable photos = 14

Photo	Time GMT	Depth m	Description
42CNV00191-032305	03:23:06	228.8	Medium to fine sandy sea bed with coral (*Lophelia pertusa*) fragments (1%) and some bioturbation. A squat lobster (*Munida* sp) is the only visible fauna.
43CNV00190-032402	03:24:02		Medium to fine sandy sea bed with cobbles (2%), coral fragments (*Lophelia pertusa*) (4%) and signs of bioturbation. Visible fauna include the nut crab (*Ebalia granulosa*), a cyclostome bryozoan colony, the asteroid *Stichastrella rosea*, the squat lobster (*Munida* sp), encrusting bryozoans and sponges (at least 3 morphospecies).
44CNV00189-032545	03:25:46	225.6	Medium to fine sandy sea bed with cobbles (6%) and signs of bioturbation. The cobbles are partially covered in a hydroid turf with sponges and bryozoans also visible.
45CNV00188-032659	03:26:58	226.6	Medium to fine sandy sea bed with clinker and signs of bioturbation. No visible fauna.
46CNV00197-032911	03:29:12	227.2	Medium to fine sandy sea bed and bioturbation. No visible fauna.
47CNV00196-033134	03:31:34	226.2	Medium sandy sea bed with cobbles (2%). Signs of bioturbation. Image taken from high in the water column. Three squat lobsters (*Munida* sp) are partially concealed beneath cobbles. Other fauna are attached forms including erect bryozoans (*Reteporella* sp and cyclostome bryozoans) and encrusting sponges and bryozoans.
48CNV00195-033240	03:32:40	226	Coarse sandy sea bed with pebbles, cobbles (29%), well packed. All visible fauna are attached or encrusting forms and include five *Reteporella* sp colonies seven cyclostome bryozoan colonies (erect bryozoans), six cup sponges (possibly *Axinella* sp), at least 3 solitary corals (*Caryophyllia* sp) and a number of Coral/anemone polyps. At least 2 morphospecies of encrusting sponge are present (yellow and white forms) as well as encrusting bryozoans and other unidentified encrusting species.
49CNV00194-033417	03:34:18	226.7	Medium to fine sandy sea bed with clinker and signs of bioturbation. The only visible fauna is a Haddock (*Melanogrammus aeglefinus*).
50CNV00193-033508	03:35:08	226.6	Medium to fine sandy sea bed with signs of bioturbation. No visible fauna.

51CNV00192-033749	03:37:49	227.1	Medium to coarse sandy sea bed with pebbles and cobbles (12%). Visible fauna include the asteroid *Stichastrella rosea*. All other fauna are attached or encrusting forms and include a zoanthid (possibly *Parazoanthus anguicomus*), cup sponges (possibly *Phakellia ventilabrum*), erect bryozoans (eight cyclostome bryozoans and two *Reteporella* sp), serpulid worm tubes, and encrusting sponges (yellow morphospecies present) and bryozoans. Other attached forms are present but could not be identified.
52CNV00001 - ?	03:38:49	225.5	Medium sandy sea bed. No visible fauna.
53CNV00200-034123	03:41:23	224	Medium to coarse sandy sea bed with cobbles (6%) and signs of bioturbation. The only visible fauna are a single colony of the erect bryozoan *Reteporella* sp and unidentified encrusting forms.
54CNV00199-034154	03:41:55	225.5	Medium sandy sea bed. Signs of bioturbation. An unidentified flatfish is visible.
55CNV00198-034335	03:43:35	224.9	Medium to coarse sandy sea bed with cobbles (4%). Visible fauna are attached or encrusting on the cobbles. Cup sponges (possibly *Phakellia ventilabrum*), seven cyclostome bryozoans and two *Reteporella* sp (erect bryozoans), a pale globose form sponge, a lamellate form sponge, encrusting sponges (yellow morphospecies visible) and bryozoans, and solitary coral (*Caryophyllia* sp) are all visible.

COR0516, 9 September 2005: Total photos = 18, usable photos = 18

Photo	Time GMT	Depth m	Description
61CNV00003-181100	18:10:59	227.4	Medium sandy sea bed with cobbles (6%). Signs of bioturbation. Visible mobile epifauna are represented by the holothurian *Stichopus tremulus*. All other fauna are associated with the cobbles. Three cup sponges (possibly *Phakellia ventilabrum*), three cyclostome bryozoans and two *Reteporella* sp (erect bryozoans), a solitary coral (*Caryophyllia* sp), small clusters of unidentified anemones, and encrusting sponges (yellow morphospecies) and bryozoans are all visible. In addition a possible sea pen is present in the top left corner of the image.
62CNV00002-181315	18:13:14	227.8	Medium to coarse sandy sea bed with signs of bioturbation. No visible fauna.
63CNV00010-181519	18:15:19	228.1	Medium to coarse sandy sea bed with signs of bioturbation. No visible fauna.
64CNV00009-181629	18:16:24	228.9	Medium sandy sea bed with coral (*Lophelia pertusa*) fragments (1%) and signs of bioturbation. No visible fauna.
65Cnv00008-181741	18:17:39	227.1	Medium sandy sea bed with cobbles (2%) and signs of bioturbation. Cobbles with very little encrusting fauna only sponges and bryozoans. *Reteporella* sp colonies and three solitary corals (*Caryophyllia* sp) are present associated with partially buried cobbles.
66CNV00007-181938	18:19:39	229.8	Medium to fine sandy sea bed with signs of bioturbation. No visible fauna.
67CNV00006-182051	18:20:49	229.5	Medium to fine sandy sea bed with signs of bioturbation. Visible fauna include the holothurian *Stichopus tremulus* and an asteroid probably *Henricia sanguinolenta*.
68CNV00005-182151	18:22:04	229.5	Medium to fine sandy sea bed with signs of bioturbation. No visible fauna.
69Cnv00016-182314	18:23:14	226.6	Medium sandy sea bed with pebbles and cobbles (36%). Signs of bioturbation. Visible epifauna include a haddock (*Melanogrammus aeglefinus*), the asteroid *Stichastrella rosea*, and nine squat lobsters (*Munida* sp), which are largely concealed among the cobbles. Erect bryozoans (one Cyclostome and one *Reteporella* sp colony), at least two morphospecies of encrusting sponges, serpulid worm tubes, encrusting bryozoans and a small cluster of anemones (zoanthids?) are attached to the cobbles.

70Cnv00015-182444	18:24:44	225.9	Medium sandy sea bed with pebbles and cobbles (8%). Signs of bioturbation. All visible fauna are associated with the cobbles. A single squat lobster (*Munida* sp) is partially hidden under a cobble. Three small cup sponges (possibly *Axinella* sp) and a large lamellate form sponge are visible. A single erect bryozoan colony *Reteporella* sp and encrusting sponges and bryozoans are also present.
71Cnv00014-182519	18:25:19	226.7	Medium sandy sea bed with cobbles and boulders (15%) and coral fragments (*Lophelia pertusa* <1% cover). The cobbles are partially sand covered but support six small cup sponges (possibly Axinella sp), and two possible solitary corals (*Caryophyllia* sp). Few fauna are visible on the boulder except three erect bryozoan colonies (*Reteporella* sp), serpulid worm tubes, and encrusting sponges and bryozoans. Two squat lobsters (*Munida* sp) are partially concealed beneath the cobbles and boulders.
72Cnv00013-182655	18:26:54	227.2	Medium to fine sandy sea bed with signs of bioturbation. The only visible fauna are fish including the tail of a flatfish, a dead juvenile shark and a dead gurnard *Eutrigla gurnardus*? A dead globose form sponge may also be present. All fauna may have been part of a catch taken earlier in the day on this vessel as part of the statutory monitoring programme.
73CNV00012-182955	18:29:54	226	Medium sandy sea bed with cobbles (1%). Signs of bioturbation. A squat lobster (*Munida* sp) and seven small clustered anemone polyps (possibly zoanthids) are associated with the cobble.
74CNV00011-183146	18:31:44	228.5	Medium to fine sandy sea bed with signs of bioturbation. No visible fauna.
75Cnv00020-183228	18:32:29	227.9	Medium sandy sea bed with boulders (18%). Boulders with some sand cover, and some attached fauna including ten solitary corals (*Caryophyllia* sp), two cup sponges (possibly *Axinella* sp) erect bryozoans (one Cyclostome and two Reteporella colonies) and encrusting sponges (yellow morphospecies) and bryozoans. An asteroid (*Henricia* sp) is also visible.
76Cnv00019-183344	18:33:44	227.1	Medium to fine sandy sea bed with signs of bioturbation. No visible fauna.
77Cnv00018-183525	18:35:24	227.3	Medium to fine sandy sea bed with signs of bioturbation. No visible fauna.
78Cnv00017-183715	18:37:14	225.9	Medium to fine sandy sea bed with signs of bioturbation. No visible fauna.

COR0517, 9 September 2005: Total photos = 7, usable photos = 7

Photo	Time GMT	Depth m	Description
81CNV00172-194741	19:47:39	232.6	Medium to coarse sandy sea bed with signs of bioturbation. No visible fauna.
82CNV00171-195007	19:50:09	232.7	Medium to coarse sandy sea bed with signs of bioturbation and animal tracks. No visible fauna.
83CNV00170-195055	19:50:54	232.6	Medium sandy sea bed bordering an area of cobbles and boulders (38%). All visible fauna are associated with the cobbles and boulders and include two squat lobsters (*Munida* sp), a palaemonid shrimp and an asteroid (*Porania pulvillus*). Attached to the cobbles and boulders are 14 cyclostome bryozoans, serpulid worm tubes, encrusting sponges (at least 2 morphospecies), bryozoans and small unidentified white encrusting forms. A stylasterid coral may also be present.
84CNV00169-195142	19:51:44	232.8	Medium sandy sea bed with cobbles (6%). All fauna are associated with the cobbles. Two squat lobsters (*Munida* sp) represent the mobile epifauna. A large number of solitary corals (~10 *Caryophyllia* sp?), erect bryozoans (five Cyclostome and three *Reteporella* colonies), encrusting sponges, bryozoans, and other unidentified attached fauna are present.
85CNV00168-195406	19:54:04	232.1	Medium to coarse sandy sea bed with signs of bioturbation. No visible fauna.
86CNV00167-195607	19:56:09	232.2	Medium sandy sea bed with cobbles (22%). All visible fauna are associated with the cobbles. Three squat lobsters (Munida sp) represent the mobile epifauna. Three cup sponges (possibly *Phakellia ventilabrum*), three solitary corals (*Caryophyllia* sp), erect bryozoans (three *Reteporella* colonies), encrusting sponges (at least 3 morphospecies), bryozoans, and other unidentified attached fauna are present. A stylasterid coral is also visible.
87CNV00176-195939	19:59:39	231.7	Medium to coarse sandy sea bed with signs of bioturbation. No visible fauna.

COR0509, 6 September 2005: Total photos = 11, usable photos = 10

Photo	Time GMT	Depth m	Description
10CNV00161-020453	20:04:54	279.2	Poor image not used.
11CNV00160-020657	20:06:59	279.4	Medium to fine sandy sea bed with some detritus and clinker. Signs of bioturbation. No visible fauna.
12CNV00159-020811	20:08:09	279.1	Medium sandy sea bed with cobbles 13%. All visible fauna are associated with the cobbles. Two large *Reteporella* colonies, a cyclostome bryozoan colony, at least four solitary coral polyps (Caryophyllia spp.), eight zoanthids? a possible cup sponge (*Axinella* sp or *Phakellia* sp) and yellow slightly globose sponges are identifiable attached fauna. Other encrusting species are present but are unidentified.
13CNV00166-020831	20:08:09	279.1	Medium sandy sea bed with cobbles 24%. Visible fauna include a Terebellid worm, at least five colonies of the erect bryozoan *Reteporella* sp, a cyclostome bryozoan, a Caryophyllid solitary coral, at least 11 zoanthids?, a small squat lobster concealed beneath a cobble (*Munida rugosa*), a small red anemone, and possibly a number of small ophiuroids (*Ophiactis* sp), which are associated with the largest *Reteporella* colony. Others encrusting species are present but were unidentified.
14CNV00165-020948	20:08:09	279.1	Medium to fine sandy sea bed with some detritus and clinker. Signs of bioturbation. Visible fauna include a swimming worm and a number (<50) of small ophiuroids (possibly *Ophiactis* sp) inhabiting organic matter (possibly buried coral fragments). There is also a possible decapod crab (centre right of the image) and an unidentified organism (possibly an Ophiuroid, bottom left of image) although these are by no means clear.
15CNV00164-021203	20:08:09	279.1	Medium to fine sandy sea bed with some detritus and clinker. Signs of bioturbation. The only visible fauna are a white echinoid? and a siphon/tube protruding from the sediment.
16CNV00163-021408	21:14:09	280.1	Medium to fine sandy sea bed with some detritus and clinker. Signs of bioturbation including a pit and mound structure. A small unidentified organism is present in the top right corner of this image.
17CNV00162-021617	21:16:19	280.5	Medium to fine sandy sea bed with some detritus and clinker. Signs of bioturbation. Visible fauna include two unidentified organisms in the top left and top right of the image.
18Cnv00083-022225	22:20:24	279.7	Medium to fine sandy sea bed with some detritus and clinker. Signs of bioturbation including animal tracks. No visible fauna.

19Cnv00082-023200	23:32:04	277.7	Medium to fine sandy sea bed with some detritus and clinker. Signs of bioturbation. No visible fauna.
20Cnv00081-023351	23:33:49	278.7	Medium sandy sea bed with cobbles 4% and some detritus. At least eight solitary coral polyps (*Caryophyllia* sp) are visible with other unidentified encrusting fauna also present.

COR0507, 5 September 2005: Total photos = 24, usable photos = 24

Photo	Time GMT	Depth m	Description
164CNV00023-230256	23:02:58	285.4	Medium to fine sandy sea bed with some detrital matter. Signs of bioturbation. A sea biscuit echinoid and other unidentifiable fauna are present.
165CNV00022-230402	23:04:08	286.2	Medium to fine sandy sea bed with some detrital matter. Signs of bioturbation. No visible fauna.
166CNV00021-230452	23:04:53	285.9	Medium to fine sandy sea bed with some detrital matter and the odd cobble. Signs of bioturbation. Visible species include the erect bryozoan *Reteporella* and a cup sponge *Phakellia* sp Two Caryophyllids and a swimming worm are also present.
167CNV00020-230544	23:05:43	285.3	Medium to fine sandy sea bed with some detrital matter and the odd cobble. Signs of bioturbation. Visible species include the erect bryozoan *Reteporella* and possibly a damaged cup sponge *Phakellia* sp Other attached and encrusting species are present but are unidentified.
168CNV00019-230746	23:07:48	281.9	Medium sandy sea bed with cobbles. Visible fauna include the bluemouth red fish (*Helicolenus dactylopterus*). All other fauna is attached to the cobbles and include the erect bryozoan *Reteporella* (four colonies), ?Caryophyllids (15 individuals), a large growth (possibly Porifera) and other unidentified encrusting species.
169CNV00018-230906	23:09:08	285	Medium to fine sandy sea bed with some detrital matter. Signs of bioturbation. No visible fauna.
170CNV00029-230952	23:09:53	285.5	Medium to fine sandy sea bed with some detrital matter. Signs of bioturbation. No visible fauna, although there is an unidentified object on the sea bed.
171CNV00028-231156	23:11:58	283.8	Medium to fine sandy sea bed with some detrital matter. Signs of bioturbation. No visible fauna.
172CNV00027-231344	23:13:43	284	Medium to fine sandy sea bed with some detrital matter. Signs of bioturbation. Unidentified macrourid.
173CNV00026-231427	23:14:28	283	Large clump of live *Lophelia pertusa* (reef) on medium sandy sea bed. Visible fauna within the reef are Cyclostome bryozoans and *Reteporella* growing on the dead coral interior. Six *Munida rugosa* are also visible within the reef.
174CNV00025-231432	23:14:33	282.9	Clump of largely dead *Lophelia pertusa* on medium sandy sea bed. Visible fauna comprise 22 squat lobsters (*Munida rugosa*). Serpulid worm tubes and hydroids are also visible growing on the dead coral.

175CNV00024-231454	23:14:53	282.4	Large clump of live Lophelia pertusa reef on medium sandy sea bed. A monk fish (*Lophius piscatorius*) is visible in a channel between reef clumps. Other fauna include six squat lobsters (probably all *Munida rugosa*) and a Palaemonid shrimp. Erect sponge forms and cyclostome bryozoans are growing on the dead coral interior.
176CNV00035-231503	23:15:03	281.7	Large clump of live *Lophelia pertusa* reef on medium sandy sea bed with cobbles. Two Palaemonid shrimps and three unidentified fish species are visible within the live coral region.
177CNV00034-231546	23:15:48	280.9	Medium sandy sea bed with cobbles. Image is taken from high in the water column. As a result the only visible fauna are larger colonies of the bryozoan *Reteporella*.
178CNV00033-231710	23:17:08	285.8	Medium to fine sandy sea bed. Signs of bioturbation. Unidentified macrourid
179CNV00032-231756	23:17:58	284.1	Large clump of live *Lophelia pertusa* reef on medium sandy sea bed. Seven squat lobsters and an asteroid (*Henricia sanguinolenta*) comprise the mobile epifauna. Cyclostome bryozoans a serpulid tube worm are visible within dead coral interior.
180CNV00031-231833	23:18:33	281.5	Dead *Lophelia pertusa* reef on medium sand substratum. Eighteen squat lobsters (probably all *Munida rugosa*) and two bluemouth red fish (*Helicolenus dactylopterus*) are concealed within the dead coral framework. The echinoid *Cidaris cidaris* is clearly visible. Erect bryozoans (*Reteporella* and cyclostome bryozoans), and erect (white globose form and yellow globose form) and encrusting sponges (yellow form) are growing on the dead coral skeleton.
181CNV00030-231946	23:19:48	281.8	Medium sandy sea bed with occasional coral (*Lophelia pertusa*) fragments. Signs of bioturbation including pit and mound structures. The only visible fauna is a swimming worm and possible small ophiuroids (*Ophiactis* sp?) within the small coral fragments.
182CNV00038-232054	23:20:53	283.1	Medium sandy sea bed with some detritus and cobbles 19%. A bluemouth red fish (*Helicolenus dactylopterus*) is the only mobile epifauna visible. All other fauna are encrusting on or associated with the cobbles and include erect bryozoans (*Reteporella* (2 large colonies) and a cyclostome bryozoan), two *Caryophyllia* spp, 11 zoanthids? and a cup sponge (*Axinella* sp). Other encrusting species are present but are unidentified.

183CNV00037-232221	23:22:23	282.3	Medium to fine sandy sea bed with some detritus and clinker. Signs of bioturbation. No visible fauna except for an unidentified organism in the bottom right corner of the image.
184CNV00036-232402	23:24:03	283.1	Medium to fine sandy sea bed with some detritus and clinker. Signs of bioturbation. No visible fauna.
185CNV00039-232433	23:24:33	283.5	Medium to fine sandy sea bed with dead (smashed), and partially buried *Lophelia pertusa*. Two holothurians *Stichopus tremulus* are the most conspicuous faunal element of this image. Two squat lobsters (probably *Munida rugosa*) and many (>100) small ophiuroids (possibly *Ophiactis* sp) are hidden among the coral debris with just their arms protruding.
186CNV00040-232450	23:24:48	283.5	Medium to fine sandy sea bed with dead (smashed), and partially buried *Lophelia pertusa*. Four squat lobsters (probably *Munida rugosa*) and many (>100) small ophiuroids (possibly *Ophiactis* sp) are hidden among the coral debris with just their arms protruding. *Reteporella*, yellow encrusting sponge and serpulid worm tubes are also visible.
187CNV00041-232518	23:25:18	282.6	Medium to fine sandy sea bed with dead (smashed), and partially buried *Lophelia pertusa*. A holothurian (*Stichopus tremulus*) and two asteroids (*Stichastrella rosea*) represent the mobile epifauna. In addition there are many (>100) small ophiuroids (possibly *Ophiactis* sp) hidden among the coral debris with just their arms protruding. *Reteporella*, yellow and blue encrusting sponges are also visible.

COR0502, 4 September 2005: Total photos = 39, usable photos = 37

Photo	Time GMT	Depth m	Description
35CNV00146-225925	22:59:28	302.9	Medium to fine sandy sea bed. No visible fauna. Signs of bioturbation.
36CNV00145-230018	23:00:18	301.7	Medium to fine sandy sea bed with some detritus. Visible fauna include the witch flatfish (*Glyptocephalus cynoglossus*) and two sea biscuit echinoids. Signs of bioturbation with animal tracks and depressions in the sediment.
37CNV00144-230118	23:01:18	302.9	Medium to fine sandy sea bed. The only visible fauna are two sea biscuit echinoids. However, there are signs of bioturbation with faecal casts present.
38CNV00143-230218	23:02:18	303.6	Medium to fine sandy sea bed. The only visible fauna is an unidentified Macrourid species. However, there are signs of bioturbation.
39CNV00142-230245	23:02:43	303.4	Medium to fine sandy sea bed. The only visible fauna is a *Cidaris cidaris* echinoid and a sea biscuit echinoid. However, there are signs of bioturbation and animal tracks are visible.
40CNV00152-230318	23:03:18	302.5	Medium to fine sandy sea bed. The only visible fauna is a holothurian (*Stichopus tremulus*). However, there are signs of bioturbation with a large pit and animal tracks visible.
41CNV00151-230419	23:04:18	300.8	Medium to fine sandy sea bed. No visible fauna. Signs of bioturbation.
42CNV00150-230435	23:04:33	300.6	Medium sandy sea bed with cobbles (20%). Signs of bioturbation including animal tracks. Visible fauna are associated with the cobbles and include an erect sponge form, seven ?Caryophyllids and the erect bryozoan *Reteporella* sp The asteroid *Porania pulvillus* is situated on the side of a cobble. Other encrusting species are present but are too distant to allow identification. Much of the sediment near the cobble area has signs of emergent structures.
43CNV00149-230444	23:04:43	300	Medium sandy sea bed with cobbles (70%). Eight squat lobsters (probably all *Munida rugosa*) and six spider crabs (Majidae) are present in among the cobbles. The cobbles themselves are well encrusted with sponges (a yellow morphotype is of note), bryozoans, serpulid worm tubes and small white unidentified encrusting forms. The holothurian *Stichopus tremulus* and two bluemouth red fish (*Helicolenus dactylopterus*).
44CNV00148-230518	23:05:18	300.2	Medium to fine sandy sea bed. No visible fauna. Signs of bioturbation.
45CNV00147-230618	23:06:18	300.7	Medium to fine sandy sea bed. The only visible fauna is a single sea biscuit echinoid. Signs of bioturbation with animal tracks visible.

46CNV00158-230718	23:07:18	300.3	Medium to fine sandy sea bed with small fragments of dead *Lophelia pertusa* (10%). The only visible fauna is a swimming worm, an unidentified Macrourid and a Palaemonid shrimp. Possible emergent structures present.
47CNV00157-230733	23:07:33	299.7	Medium to fine sandy sea bed with lumps of dead (smashed) *Lophelia pertusa* (80%). Two sea biscuit echinoids are concealed among the coral debris and possibly a large number of small ophiuroids (possibly *Ophiactis* sp) although this is by no means clear. A yellow encrusting sponge is visible growing on the dead coral fragments.
48CNV00156-230750	23:07:48	299.2	Medium to fine sandy sea bed almost entirely covered with lumps of dead (smashed) *Lophelia pertusa* (95%). A squat lobster (probably Munida rugosa), two Palaemonid shrimps and a large number of small ophiuroids (possibly *Ophiactis* sp) are concealed among the coral debris. A yellow encrusting sponge is visible growing on the dead coral fragments. A holothurian (Stichopus tremulus) is also clearly visible.
49CNV00155-230818	23:08:18	298.6	Medium to fine sandy sea bed almost entirely covered with lumps of dead (smashed) *Lophelia pertusa* (90%). Five unidentified crustaceans (most likely to be either *Munida rugosa* and/or Palaemonid shrimps) and a large number of small ophiuroids (possibly *Ophiactis* sp) are concealed among the coral debris. A yellow encrusting sponge is visible growing on the dead coral fragments. A *Cidaris cidaris* echinoid and a small pale red anemone are also visible.
50CNV00154-230903	23:09:03	296.7	Medium to fine sandy sea bed entirely covered with lumps of dead (smashed) *Lophelia pertusa* (100%). Two *Munida rugosa*, another three unidentified crustaceans (most likely to be either *Munida rugosa* and/or Palaemonid shrimps) and a number of small ophiuroids (possibly *Ophiactis* sp) are concealed among the coral debris. A yellow encrusting sponge is visible growing on the dead coral fragments.
51CNV00153-230918	23:09:18	296.6	Medium to fine sandy sea bed almost entirely covered with lumps of dead (smashed) *Lophelia pertusa* (90%). An unidentified crustacean (most likely to be either *Munida rugosa* or Palaemonid shrimps) and a number of small ophiuroids (possibly *Ophiactis* sp) are concealed among the coral debris.
52CNV00083-231018	23:10:18	300.3	Medium to fine sandy sea bed. No visible fauna except possibly a growth of the erect bryozoan *Reteporella* (image is not clear). Signs of bioturbation including a mound and pit formation.
58CNV00089-231518	23:15:18	296.9	Medium to fine sandy sea bed. No visible fauna. Signs of bioturbation.

59CNV00088-231608	23:16:08	296.5	Medium sandy sea bed with cobbles. All of the visible fauna, except for one sea biscuit echinoid, is associated with the cobble area. A sea pen (Pennatulidae) is the most prominent faunal element in this image. A bluemouth red fish (Helicolenus dactylopterus) and a holothurian (Stichopus tremulus) are also obvious faunal components. A *Cidaris cidaris* echinoid and a squat lobster (*Munida rugosa*) are associated with a cobble on which a large yellow encrusting sponge is visible. Three unidentified crustaceans (most likely *Munida rugosa*) are just visible between adjacent cobbles. Other attached organisms include three ?Caryophyllids, three small red anemones, encrusting sponges, bryozoans, other unidentified encrusting forms and hydroids.
60CNV00087-231621	23:16:18	296.4	Medium to fine sandy sea bed. No visible fauna. Signs of bioturbation including animal tracks and faecal casts.
61CNV00086-231718	23:17:18	297.2	Medium to fine sandy sea bed. The only visible fauna is a sea biscuit echinoid. Signs of bioturbation.
62CNV00085-231818	23:18:18	297.4	Medium to fine sandy sea bed. The only visible fauna is a hermit crab (Paguridae) and a swimming worm. Signs of bioturbation and faecal casts.
63CNV00084-231838	23:18:38	297	Medium sandy sea bed with cobbles (30%) Visible fauna include the holothurian Stichopus tremulus, a swimming worm, a sea biscuit echinoid, and an unidentified crustacean concealed beneath a cobble (probably *Munida rugosa*). The cobbles have many attached and encrusting forms including six ?Caryophyllids, polyps, serpulid worm tubes, encrusting sponges and bryozoans as well as other unidentified forms. Two small fragments of dead *Lophelia pertusa* support a number (<20) of small ophiuroids (possibly *Ophiactis* sp) hidden within the coral skeleton. Signs of bioturbation including mounds and animal tracks are present. Possible emergent structures visible.
64CNV00095-231918	23:19:18	297.6	Medium sandy sea bed with cobbles 5%. Visible fauna include a swimming worm (possibly two), a sea biscuit echinoid and two unidentified crustaceans (probably a Palaemonid shrimp and a squat lobster, *Munida rugosa*). A ?Caryophyllid polyp, serpulid worm tubes and other encrusting species are present on the cobble.
65CNV00094-232018	23:20:18	300.1	Medium to fine sandy sea bed. The only visible fauna is a hermit crab (Paguridae) and an unidentified asteroid. Signs of bioturbation with animal tracks.

66CNV00093-232044	23:20:43	300.3	Medium sandy sea bed with cobbles 50%. A bluemouth red fish (*Helicolenus dactylopterus*) is visible among the cobbles. Other species include a spider crab (Majidae), a squat lobster (probably *Munida rugosa*) and two unidentified crustaceans. The cobbles are encrusted with sponges, bryozoans, serpulid worm tubes (two worms are visible) and other unidentified encrusting species.
67CNV00092-232120	23:21:18	299.4	Medium sandy sea bed with cobbles and a boulder 75%. All visible fauna are attached or associated with the cobbles and boulders. A colony of the erect bryozoan *Reteporella* sp, two small red anemones and two unidentified crustaceans are present. The cobbles and boulders are heavily encrusted with sponges, bryozoans, serpulid worm tubes and other unidentified forms.
68CNV00091-232220	23:22:18	299.6	Medium to fine sandy sea bed. No visible fauna. Signs of bioturbation.
69CNV00090-232229	23:22:28	299.8	Medium to fine sandy sea bed. Signs of bioturbation. Visible species include a haddock (*Melanogrammus aeglefinus*), the asteroid *Astropecten irregularis*, an unidentified asteroid and a sea biscuit echinoid.
70CNV00101-232419	23:24:18	298.2	Medium to fine sandy sea bed with occasional cobbles 10%. The only visible fauna is encrusting on the cobbles although cannot be identified. Signs of bioturbation.
71CNV00100-232431	23:24:33	297.5	Medium sandy sea bed largely covered with cobbles 85%. Visible species include the asteroid *Porania pulvillus*, three squat lobsters (*Munida rugosa*) concealed among the cobbles, a bluemouth red fish (*Helicolenus dactylopterus*) and a holothurian *Stichopus tremulus*. Another 13 unidentified crustaceans are present, many of which are likely to be *Munida rugosa*. The cobbles are encrusted with sponges, bryozoans, serpulid worm tubes and other unidentified species.
72CNV00099-232518	23:25:18	295.5	Poor image, not used.
73CNV00098-232620	23:26:18	296.6	Medium to fine sandy sea bed. The only visible fauna is a hermit crab (Paguridae). Signs of bioturbation.
74CNV00097-232719	23:27:23	295.9	Medium to fine sandy sea bed. The only visible fauna is a sea biscuit echinoid. Signs of bioturbation and emergent structures.
75CNV00096-232821	23:28:23	296	Medium sandy sea bed with cobbles 34%. All visible fauna are attached or encrusting on the cobbles. Fauna include a Stylasterid coral, encrusting sponges, bryozoans, serpulid worm tubes and other unidentified encrusting species.

76CNV00106-232831	23:28:33	295.8	Medium sandy sea bed with cobbles 60%. Two bluemouth red fish (*Helicolenus dactylopterus*), and five unidentified crustaceans are the visible mobile epifauna. All other fauna are associated with the cobbles and include lamellate, globose and encrusting sponge forms, encrusting bryozoans, serpulid worm tubes and other unidentified encrusting forms.
77CNV00105-232919	23:29:18	296.4	Poor image, not used.

COR0503, 5 September 2005: Total photos = 16, usable photos = 16

Photo	Time GMT	Depth m	Description
79CNV00104-002309	00:23:08	311.4	Medium to fine sandy sea bed. The only visible fauna are a hermit crab (Paguridae) and two burrowing anemones. Signs of bioturbation.
80CNV00103-002455	00:24:53	311.5	Medium to fine sandy sea bed with some detritus. The only visible fauna are two hermit crabs (Paguridae) and a holothurian *Stichopus tremulus*. Signs of bioturbation including animal tracks.
81CNV00102-002601	00:26:03	311.9	Medium sandy sea bed with cobbles 50%. Visible fauna include the holothurian *Stichopus tremulus*, other fauna are encrusting on the cobbles and include encrusting sponges, bryozoans, serpulid worm tubes and other unidentified encrusting forms.
82CNV00112-002620	00:26:18	312	Medium to fine sandy sea bed with some detritus. The only visible fauna are a spider crab (Majidae) and a hermit crab (Paguridae). Signs of bioturbation including animal tracks and depressions in the sediment.
83CNV00111-002855	00:28:53	311.4	Medium to fine sandy sea bed with some detritus. No visible fauna. Signs of bioturbation. Possible emergent structures present.
84CNV00110-002953	00:29:53	310.1	Medium sandy sea bed with cobbles 35%. Visible fauna include a holothurian (*Stichopus tremulus*), two swimming worms and a polychaete tube worm. There are encrusting fauna present on the cobbles including encrusting sponges, bryozoans, serpulid worm tubes, small white unidentified encrusting organisms and other unidentified species. There are signs of bioturbation and emergent structures are present.
85CNV00109-003055	00:30:53	311	Medium to fine sandy sea bed with some detritus. The only visible fauna is a swimming worm. Signs of bioturbation and animal tracks and a pit and mound structure.
86CNV00108-003133	00:31:33	310.7	Medium sandy sea bed with cobbles 50%. Visible fauna include a small red anemone. Other fauna are encrusting on the cobbles and include encrusting sponges, bryozoans, serpulid worm tubes and other unidentified encrusting forms. An unidentified number of small ophiuroids (possibly *Ophiactis* sp) are present in the cracks within a cobble. Emergent structures are present.

87CNV00107-003231	00:32:33	310.4	Medium to fine sandy sea bed with some detritus. The only visible fauna is a holothurian (*Stichopus tremulus*). Signs of bioturbation with animal tracks, faecal casts and depressions in the sediment.
88CNV00118-003255	00:33:53	309.9	Medium to fine sandy sea bed with some detritus. The only visible fauna are two hermit crabs (Paguridae). Signs of bioturbation and animal tracks.
89CNV00117-003455	00:34:53	309.5	Medium sandy sea bed with cobbles 5%. All visible fauna are associated with the cobble and consist of encrusting species including sponges, bryozoans, serpulid worms and other organisms. Signs of bioturbation with animal tracks and emergent structures.
90CNV00116-003511	00:35:13	309.2	Medium sandy sea bed with cobbles 30%. Visible species include the holothurian (*Stichopus tremulus*) and a swimming worm. Other visible fauna are associated with the cobble and consist of encrusting species including sponges, bryozoans, serpulid worms and other organisms. Signs of bioturbation including mounds and depressions in the sediment.
91CNV00115-003655	00:36:53	310.5	Medium to fine sandy sea bed with some detritus. The only visible fauna is a burrowing anemone. Signs of bioturbation and animal tracks.
92CNV00114-003855	00:38:53	309.4	Medium sandy sea bed with cobbles 8%. No visible fauna accept that encrusting on the cobbles, which include sponges, bryozoans, serpulid worms and other organisms.
93CNV00113-004055	00:40:53	310.9	Medium to fine sandy sea bed with some detritus. No visible fauna. Signs of bioturbation including animal tracks and pit and mound structures.
94CNV00045-004257	00:42:53	312.5	Medium to fine sandy sea bed with some detritus. No visible fauna. Signs of bioturbation.

COR0501, 4 September 2005: Total photos = 23, usable photos = 22

Photo	Time GMT	Depth m	Description
10CNV00124-214049	21:40:48	328.2	Medium to fine sandy sea bed with some detritus and two fragments of the coral *Lophelia pertusa*. No visible fauna but signs of bioturbation. Possible emergent structures present.
11CNV00123-214106	21:41:08	328.1	Medium to fine sandy sea bed. Visible fauna include 3 sea biscuit echinoids, a Megrim (*Lepidorhombus boscii*), and a swimming worm. Signs of bioturbation. Possible emergent structures present.
12CNV00122-214148	21:41:53	327.5	Medium to fine sandy sea bed. The only visible fauna are a swimming worm; however signs of bioturbation include a pit and mound structure. Possible emergent structures present.
13CNV00121-214225	21:42:23	326.8	Medium to fine sandy sea bed. No visible fauna but signs of bioturbation in the form of animal tracks. Possible emergent structures present.
14CNV00120-214233	21:42:33	326.5	Large clump of live *Lophelia pertusa* approx 1m wide, 2m long, 0.6m high on medium to fine sand substratum. Image only captures the top of the reef. Visible fauna include unidentified erect sponge form and the echinoid *Cidaris* sp.
15CNV00119-214249	21:42:48	325.9	Medium to fine sandy sea bed with coral (*Lophelia pertusa*) fragments and an accumulation of silt or detritus. A large burrow opening and sighs of bioturbation are evident.
16CNV00130-214315	21:43:13	324.5	Medium to fine sandy sea bed with large lumps of dead (smashed) *Lophelia pertusa*. Six squat lobsters (probably all *Munida rugosa*) are concealed among the coral debris. Other visible fauna belong to the Echinodermata and include two *Stichopus tremulus* holothurians, an echinoid Echinus sp and an asteroid *Porania pulvillus*. A yellow encrusting sponge is visible growing on the dead coral fragments.
17CNV00129-214327	21:43:28	323.6	Medium to fine sandy sea bed with large lumps of dead (smashed) *Lophelia pertusa*. Four squat lobsters (probably *Munida rugosa*) and an unidentified decapod (possibly Cancer bellianus) are concealed among the coral debris. An asteroid *Porania pulvillus* and an echinoid *Cidaris cidaris* are both visible at the edge of the coral debris area. A yellow encrusting sponge is visible growing on the dead coral fragments.
18CNV00128-214347	21:43:48	321.8	Medium to fine sandy sea bed with lumps of dead (smashed) *Lophelia pertusa*. There is a distinct trawl mark that can be seen as a straight line crossing the image from the top right to the bottom left. No fauna are visible in this image.

19CNV00127-214400	21:43:58	321.3	Medium to fine sandy sea bed with lumps of dead (smashed) *Lophelia pertusa*. Visible fauna in this image include a Witch flatfish (Glyptocephalus cynoglossus), the holothurian *Stichopus tremulus* and a yellow encrusting sponge growing on the dead coral.
20CNV00126-214409	21:44:08	321.3	Medium to fine sandy sea bed with lumps of dead (smashed) *Lophelia pertusa*. Two squat lobsters (probably *Munida rugosa*) are concealed among the coral debris. A yellow encrusting sponge is visible growing on the dead coral fragments and a *Cidaris cidaris* echinoid is visible just out of shot.
21CNV00125-214447	21:44:48	320.4	Medium to fine sandy sea bed. No visible fauna but signs of bioturbation in the form of animal tracks. Possible emergent structures present.
22CNV00136-214550	21:45:48	321.5	Medium to fine sandy sea bed. The only visible fauna are two holothurians (*Stichopus tremulus*). Signs of bioturbation and a pit and mound structure. Emergent structures present.
23CNV00135-214650	21:46:48	323.9	Poor image, not used.
24CNV00134-214748	21:47:48	324.7	Medium to fine sandy sea bed. No visible fauna. Signs of bioturbation and a pit and mound structure.
25CNV00133-214847	21:48:48	325.3	Medium to fine sandy sea bed. The only visible fauna are the asteroid *Stichastrella rosea* and a Palaemonid shrimp. Signs of bioturbation including two pit and mound structures, animal tracks and depressions.
26CNV00132-214947	21:49:48	324.8	Medium to fine sandy sea bed. No visible fauna. Signs of bioturbation. Possible emergent structures present.
27CNV00131-215047	21:50:48	323.8	Medium to fine sandy sea bed. The only visible fauna are two hermit crabs (Paguridae), a swimming worm and five sea biscuits. Signs of bioturbation including animal tracks and mounds. Possible emergent structures present.
28CNV00141-215148	21:51:48	322.7	Medium to fine sandy sea bed. No visible fauna. Signs of bioturbation.
29CNV00140-215249	21:52:48	322.7	Medium to fine sandy sea bed. The only visible fauna are two hermit crabs (Paguridae) and three sea biscuits. Signs of bioturbation.
30CNV00139-215358.	21:53:58	323.1	Medium to fine sandy sea bed. The only visible fauna are three hermit crabs (Paguridae) and an echinoid (possibly *Spatangus raschi*). Signs of bioturbation including animal tracks. Possible emergent structures present.
31CNV00138-215449	21:54:48	322.6	Medium to fine sandy sea bed. The only visible fauna are a sea biscuit echinoid and two echinoids (possibly *Spatangus raschi*). Signs of bioturbation including animal tracks. Possible emergent structures present.
32CNV00137-215549	21:55:48	322.5	Medium to fine sandy sea bed. No visible fauna. Signs of bioturbation.

COR0506, 5 September 2005: Total photos = 17, usable photos =

Photo	Time GMT	Depth m	Description
147CNV00006-215638	21:56:38	326.9	Large clump of *Lophelia pertusa* with dead interior and live edges on medium sand substratum. Seven *Munida rugosa* are present within the reef structure. The erect bryozoan *Reteporella*, cyclostome bryozoans, hydroids and encrusting yellow sponge are visible growing on the dead sections of reef.
148CNV00005-215704	21:57:03	324.8	Medium sandy sea bed. No visible fauna.
149CNV00004-215811	21:58:13	327.3	Medium to fine sandy sea bed with some detrital matter. Signs of bioturbation. One hermit crab (Paguridae) is visible.
150CNV00003-215910	21:59:08	328.3	Medium to fine sandy sea bed with some detrital matter. Signs of bioturbation. No visible fauna.
151CNV00002-220011	22:00:13	327.4	Medium to fine sandy sea bed with some detrital matter. Signs of bioturbation. One hermit crab (Paguridae) is visible.
152CNV00001-220054	22:00:53	326.6	Medium Sandy sea bed with cobbles 40%. Many colonies of the erect bryozoan *Reteporella*. The squat lobster (*Munida rugosa*) is partially concealed beneath a cobble. Other organisms are present but are too distant to identify, however, small orange marks on the *Reteporella* and some of the cobbles are likely to be ophiuroids. Serpulid worm tubes (one worm visible), and encrusting species including bryozoans are present on the cobbles. In the sediment siphons/tubes are evident.
153CNV00012-220104	22:01:03	327.4	Medium sandy sea bed with cobbles 48%. The cobbles support large growths of the erect bryozoan *Reteporella*, encrusting sponges (blue type is of note), bryozoans, serpulid worm tubes (two worms visible) and a small red anemone. Two squat lobsters (*Munida rugosa*) are characteristically positioned beneath cobbles. A number of small ophiuroids (possibly *Ophiactis* sp) are visible in the crevices within cobbles.
154CNV00011-220306	22:03:08	27.7	Medium to fine sandy sea bed with some detrital matter. Signs of bioturbation. One swimming worm is visible.
155CNV00010-220408	22:04:08	328	Medium to fine sandy sea bed with some detrital matter. Signs of bioturbation. No visible fauna

156CNV00009-220503	22:05:03	326.8	Medium sandy sea bed with cobbles 40%. Visible fauna are generally associated with the cobbles and include eight ?Caryophyllids polyps, colonies of the erect bryozoan *Reteporella* and two sea biscuit echinoids. The cobbles are well covered with other unidentified encrusting species.
157CNV00008-220623	22:06:23	326.2	Medium to fine sandy sea bed with some detrital matter. Signs of bioturbation. No visible fauna.
158CNV00007-220704	22:07:03	327	Medium to fine sandy sea bed with detrital matter. Signs of bioturbation. No visible identifiable fauna.
159CNV00017-220802	22:08:03	327	Medium to fine sandy sea bed with detrital matter. Signs of bioturbation. No visible identifiable fauna.
160CNV00016-220900	22:09:03	327.1	Medium to fine sandy sea bed with detrital matter. Signs of bioturbation. Unidentified macrourid.
161CNV00015-220918	22:09:18	326.8	Medium sandy sea bed with cobbles 14%. The cobbles support six large colonies of the erect bryozoan *Reteporella*. In addition there is one cyclostome bryozoan colony, three red anemones, approximately twenty zoanthids?., and three ?Caryophyllids growing on the cobbles as well as many unidentified attached and encrusting forms. In the sediment a siphon/tube is visible.
162CNV00014-221013	22:10:13	326.9	Medium to fine sandy sea bed with detrital matter. Signs of bioturbation. Two sea biscuit echinoid are the only visible fauna.
163CNV00013-221104	22:11:03	327.4	Medium to fine sandy sea bed with some detrital matter. Signs of bioturbation. No visible identifiable fauna.

COR0505, 5 September 2005: Total photos = 10, usable photos = 10

Photo	Time GMT	Depth m	Description
111CNV00053-025639	02:56:43	330.9	Medium to fine sandy sea bed. Visible fauna are three swimming worms. Signs of bioturbation. Much of the sea bed shows signs of the presence of emergent structures.
112CNV00052-025834	02:58:33	330.1	Medium to fine sandy sea bed. No visible fauna. Signs of bioturbation and emergent structures.
113CNV00062-025849	02:58:48	330.1	Medium sandy sea bed with cobbles 15%. Signs of bioturbation and faecal casts. Emergent structures present. Other visible fauna are encrusting sponges, bryozoans, serpulid worm tubes, small white unidentified encrusting organisms and other unidentified species.
114CNV00061-030034	03:00:33	329.2	Medium to fine sandy sea bed. Visible fauna is a sea biscuit echinoid. Signs of bioturbation including animal tracks.
115CNV00060-030733	03:07:33	327.8	Medium to fine sandy sea bed. No visible fauna. Signs of bioturbation.
116CNV00059-030805	03:08:03	327.4	Medium sandy sea bed with cobbles 45%. Visible fauna are three holothurians (*Stichopus tremulus*) and a bluemouth red fish (*Helicolenus dactylopterus*). Other visible fauna are encrusting sponges, bryozoans, serpulid worm tubes, small white unidentified encrusting organisms and other unidentified species.
117CNV00058-030834	03:08:33	327.2	Medium sandy sea bed with cobbles 18%. Visible fauna are a squat lobster (*Munida rugosa*) and three decapods (possibly *Paramola cuvieri*). Signs of bioturbation including animal tracks and mounds. Other visible fauna are colonies of the erect bryozoan *Reteporella* sp, and ?Caryophyllids., encrusting sponges, bryozoans, serpulid worm tubes and other unidentified encrusting organisms.
118CNV00057-030942	03:09:43	328.5	Medium to fine sandy sea bed. No visible fauna. Signs of bioturbation including an animal track and faecal cast.
120CNV00064-031055	03:10:53	326.8	Medium sandy sea bed with cobbles 15%. Visible fauna include a holothurian (*Stichopus tremulus*). Other visible fauna are seven ?Caryophyllids., hydroids, encrusting sponges, bryozoans, serpulid worm tubes, and other unidentified encrusting species.
121CNV00063-031236	03:12:38	326.1	Medium to fine sandy sea bed. Visible fauna are two *Cidaris cidaris* echinoids. Signs of bioturbation including an animal track. Emergent structures present.

COR0504, 5 September 2005: Total photos = 13, usable photos = 13

Photo	Time GMT	Depth m	Description
97CNV00044-013534	13:35:33	344.6	Medium to fine sandy sea bed. The only visible fauna are three hermit crabs (Paguridae). Signs of bioturbation.
98CNV00043-013723	13:37:23	345.5	Medium to fine sandy sea bed. Visible fauna include nine hermit crabs (Paguridae) and one Palaemonid shrimp. Signs of bioturbation.
99CNV00042-013924	13:39:23	347.3	Medium to fine sandy sea bed. Visible fauna are three hermit crabs (Paguridae). Signs of bioturbation including pits with siphons/tubes and pit and mound structures.
100CNV00051-014123	14:41:23	348	Medium to fine sandy sea bed. Visible fauna are a hermit crab (Paguridae) and a pipe fish (probably a snake pipefish *Entelurus aequoraeus*). Signs of bioturbation including animal tracks and faecal casts.
101CNV00050-014322	14:43:23	347.5	Medium to fine sandy sea bed. Visible fauna are five hermit crabs (Paguridae). Signs of bioturbation including faecal casts.
102CNV00049-014522	14:45:23	344.7	Medium to fine sandy sea bed. No visible fauna. Signs of bioturbation including a pit and mound structure.
103CNV00048-014728	14:47:28	346	Medium to fine sandy sea bed. Visible fauna are a hermit crab (Paguridae) and a holothurian (*Stichopus tremulus*). Signs of bioturbation including a pit with siphon/tube.
104CNV00047-014923	14:49:18	348.9	Medium to fine sandy sea bed. Visible fauna is a swimming worm. Signs of bioturbation.
105CNV00046-015023	15:50:23	348	Medium to fine sandy sea bed. Visible fauna are two swimming worms, a hermit crab (Paguridae) and an echinoid (*Spatangus raschi*). Signs of bioturbation including a pit and mound structure, a dotted track and faecal casts.
106CNV00056-015123	15:51:18	346.3	Medium to fine sandy sea bed. Visible fauna is an echinoid (Spatangus raschi). Signs of bioturbation including animal tracks.
107CNV00055-015322	15:53:23	345.9	Medium to fine sandy sea bed. Visible fauna are two swimming worms, a hermit crab (Paguridae), a sea biscuit echinoid and an unidentified asteroid. Signs of bioturbation including animal tracks.
108CNV00054-015524	15:55:23	346.6	Medium to fine sandy sea bed. Visible fauna are two hermit crabs (Paguridae). Signs of bioturbation including animal tracks.

DW05909, 8 September 2005: Total photos = 1, usable photos = 1

Photo	Time GMT	Depth m	Description
68Cnv00027-025912	25:59:10	425.1	Medium to fine sandy sea bed with depressions, detritus and emergent fauna. Emergent fauna are possibly small burrowing anemones or tube worms. Other visible fauna include two echinoids (*Echinus acutus*) and a *Chimaera*.

DW05903, 6 September 2005: Total photos = 9, usable photos = 9

Photo	Time GMT	Depth m	Description
48Cnv00100-001919	00:19:14	508.9	Medium to fine sandy sea bed with signs of bioturbation, detritus and emergent fauna. Visible fauna include the holothurian *Stichopus tremulus*, and the tail of a *Chimaera*.
49Cnv00099-002038	00:20:34	508.8	Medium to fine sandy sea bed with few emergent structures. A large prawn burrow (*Nephrops norvegicus*) is present with a single occupant visible from one entrance and a characteristic waste pile visible at the other entrance.
50Cnv00098-002341	00:23:39	506.8	Medium to fine sandy sea bed. A *Chimaera* is visible.
51Cnv00097-002629	00:26:29	505.6	Medium to fine sandy sea bed with few emergent structures, detritus, animal tracks and the odd pebble. A possible old prawn burrow is present, visible as a depression in the sediment. A bluemouth red fish (*Helicolenus dactylopterus*) is present in the depression. An unidentified anemone is visible attached to the pebble.
52Cnv00096-002703	00:27:04	505.2	Medium to fine sandy sea bed with few emergent structures, detritus and animal tracks. A possible old prawn burrows is present, visible as a depression in the sediment. A macrourid (*Coelorhynchus coelorhynchus*) is clearly visible.
53Cnv00095-002750	00:27:49	504.7	Medium to fine sandy sea bed with few emergent structures, detritus and animal tracks. A grenadier is clearly visible.
54Cnv00104-003448	00:34:49	500	Medium to fine sandy sea bed with few emergent structures, detritus and animal tracks. A possible old prawn burrows is present, visible as a depression in the sediment. An *Echinus acutus* echinoid, a *Spatangus raschi* echinoid and an asteroid not identifiable are visible.
55Cnv00103-004019	00:40:19	494.7	Medium to fine sandy sea bed with few emergent structures, detritus and animal tracks. An extensive (or more than one) prawn burrow is present, although no occupant is visible.
56Cnv00102-004411	00:44:09	491.7	Medium to fine sandy sea bed with few emergent structures, detritus and animal tracks. A *Cidaris cidaris* echinoid is clearly visible.

DW05904, 7 September 2005: Total photos = 8, usable photos = 8

Photo	Time GMT	Depth m	Description
59Cnv00101-015832	01:58:34	511.1	Medium to fine sandy sea bed with mounds, depressions, animal tracks, detritus and emergent fauna. The only visible fauna is an echinoid (*Echinus acutus*) and an unidentified burrowing red anemone.
60Cnv00026-020123	02:01:24	509.6	Medium to fine sandy sea bed with mounds, depressions, animal tracks, detritus and emergent fauna. Visible fauna include a hermit crab (Paguridae), an unidentified burrowing red anemone, and a tube worm.
61Cnv00025-021006	02:10:05	503.5	Medium to fine sandy sea bed with mounds, depressions, animal tracks, detritus and emergent fauna. Visible fauna include four unidentified burrowing red anemones and an echinoid (*Echinus acutus*). A possible tube worm is also visible.
62Cnv00024-021314	02:13:15	501.2	Medium to fine sandy sea bed with mounds, depressions, animal tracks, detritus and emergent fauna. Emergent fauna are possibly small; burrowing anemones or tube worms. Other visible fauna include the tail of a grenadier and an echinoid (*Echinus acutus*).
63Cnv00023-021515	02:15:15	499.5	Medium to fine sandy sea bed with mounds, depressions, animal tracks, detritus and emergent fauna. A number of possible old prawn burrows are present, visible as a series of depressions in the sediment. Emergent fauna are possibly small burrowing anemones or tube worms. Other visible fauna include an echinoid (*Echinus acutus*), a small red burrowing anemone, a large burrowing anemone and a serpulid worm tube attached to a single pebble.
64CNV00022-021742	02:17:45	497	Medium to fine sandy sea bed with detritus and emergent fauna. A possible old prawn burrow is present, visible as depressions in the sediment. Emergent fauna are possibly small burrowing anemones or tube worms. Other visible fauna include two echinoids (*Echinus acutus*), a large burrowing anemone and a palaemonid shrimp.

65Cnv00021-202053	02:20:50	493.7	Medium to fine sandy sea bed with detritus and few emergent fauna. A number of possible old prawn burrows are present, visible as a series of depressions in the sediment. Emergent fauna are possibly small burrowing anemones or tube worms. Other visible fauna include an echinoid (*Echinus acutus*).
66Cnv00029-022251	02:22:50	491	Medium to fine sandy sea bed with mounds, depressions, animal tracks, detritus and emergent fauna. Emergent fauna are possibly small burrowing anemones or tube worms. Other visible fauna include eight echinoids (*Echinus acutus*) and five large burrowing anemones.

DW05905, 7 September 2005: Total photos = 1, usable photos = 1

Photo	Time GMT	Depth m	Description
67Cnv00028-205750	20:57:50	512.6	Medium to fine sandy sea bed with depressions, detritus and emergent fauna. Emergent fauna are possibly small burrowing anemones or tube worms. Other visible fauna include eight echinoids (*Echinus acutus*) and five large burrowing anemones.

DW05901, 6 September 2005: Total photos = 11, usable photos = 11

Photo	Time GMT	Depth m	Description
35Cnv00084-211159	21:11:59	538	Very poor image. Film corrupted. Medium to coarse sandy sea bed signs of bioturbation and/or currents. Visible fauna include nine *Echinus acutus* echinoids and three crabs (*Paramola cuvieri*).
36Cnv00090-211513	21:15:14	535.7	Medium to fine sandy sea bed with signs of bioturbation and/or currents and lebenspurren in the form of animal tracks. Visible fauna include a holothurian (*Stichopus tremulus*), 11 echinoids (*Echinus acutus*) and one crab (*Paramola cuvieri*).
37Cnv00089-211558	21:15:59	535.1	Medium to fine sandy sea bed with signs of bioturbation and/or currents and lebenspurren in the form of animal tracks. Visible fauna include at least 40 echinoids (*Echinus acutus*) and three crabs (*Paramola cuvieri*).
38Cnv00088-211828	21:18:29	533.2	Medium to fine sandy sea bed with the odd echinoid test, signs of bioturbation and/or currents, and lebenspurren in the form of animal tracks. Visible fauna include a holothurian (*Stichopus tremulus*), five echinoids (*Echinus acutus*) and a flatfish.
39Cnv00087-211912	21:19:14	532.9	Medium to fine sandy sea bed with the odd echinoid test, signs of bioturbation and/or currents, and lebenspurren in the form of animal tracks. Visible fauna include seven *Echinus acutus* echinoids and one *Spatangus raschi* echinoid.
40Cnv00086-212012	21:20:14	531.5	Medium to fine sandy sea bed with the odd echinoid test, signs of bioturbation and/or currents, and lebenspurren in the form of animal tracks. Visible fauna include four *Echinus acutus* echinoids and one *Spatangus raschi* echinoid. A lost fishing net is clearly visible in this image.
41Cnv00085-212015			Medium to fine sandy sea bed with the odd echinoid test, signs of bioturbation and/or currents, and lebenspurren in the form of animal tracks and mounds. Visible fauna include four *Echinus acutus* echinoids and one *Spatangus raschi* echinoid. A lost fishing net is clearly visible in this image.
42Cnv00094-212142	21:21:44	530.6	Medium to fine sandy sea bed with the odd echinoid test, signs of bioturbation and/or currents, and lebenspurren in the form of animal tracks. Visible fauna include seven *Echinus acutus* echinoids.

43Cnv00093-212358	21:23:59	529.1	Medium to fine sandy sea bed with detritus, signs of bioturbation and/or currents and lebenspurren in the form of animal tracks. Visible fauna include 14 echinoids (*Echinus acutus*) and one crab (*Paramola cuvieri*).
44Cnv00092-213044	21:30:44	523.5	Medium to fine sandy sea bed with detritus, signs of bioturbation and/or currents, and lebenspurren in the form of animal tracks. Visible fauna include 14 *Echinus acutus* echinoids, one *Spatangus raschi* echinoid and one crab *Paramola cuvieri*.
45Cnv00091-213407	21:34:09	520.8	Medium to fine sandy sea bed with the odd boulder, shell gravel and echinoid tests. Signs of bioturbation and/or currents. Visible fauna include three echinoids *Echinus acutus* and a crab (probably *Bathynectes maravigna*).

Rock_3, 11 September 2006: Total photos = 18, usable photos = 17

Photo	Time GMT	Depth m	Description
RC_3_0027	02:46	225.3	Medium muddy sand seabed with dense silt cover, no visible epifauna.
RC_3_0028	02:48	224.4	Mixed cobbles and pebbles (20%) on muddy, silt covered sand seabed. A large banded ophiuroid (probably *Ophiophelis acueata*) is visible at the top right of the image, with the arms of another projecting from under a cobble. At least 2 cup corals (*Caryophyllia* sp) are also present. The cobble at the top of the image house the majority of the fauna within this image, including encrusting fauna, globose sponges and erect bryozoan (*Reteporella* sp).
RC_3_0029	02:49	224.8	Not usable – silt cloud
RC_3_0030	02:51	224.4	Medium-fine muddy sand seabed with silt cover. No visible epifauna.
RC_3_0031	02:52	223.2	Mixed cobbles and pebbles (50%) on sand substrate. Abundant squat lobsters (9) are evident, with a single small soft coral visible in the centre of the image. Other less conspicuous fauna are what appear to be hydroids at the top of the image.
RC_3_0032	02:52	223.9	Medium sand seabed with cobbles (5%). Visibility is slightly obscured by a silt cloud. Obvious fauna include a single squat lobster, a cup coral (*Caryophyllia* sp) small bryozoan and a soft coral. The majority of the fauna are associated with the cobbles.
RC_3_0033	02:53	224.0	Medium-fine muddy sand with silt cover. One *Caryophyllia* sp is visible at bottom centre of the image.
RC_3_0034	02:54	224.0	Broad expanse of medium sand seabed with cobbles (10%). Visibility is poor and thus faunistic detail difficult to observe. Some encrusting fauna is visible on a cobble in the centre of the image.
RC_3_0035	02:56	223.3	Medium-fine muddy sand with cobbles (10%). No visible epifauna.
RC_3_0036	02:57	222.8	Medium-fine muddy sand with silt cover. No visible epifauna.
RC_3_0037	02:58	223.0	Medium muddy sand seabed with cobbles (15%). Two squat lobsters are visible at the bottom left corner of the image. Also, some encrusting fauna is visible on the cobbles on the top of the image, although difficult to identify.
RC_3_0038	02:59	222.9	Medium muddy sand seabed with silt cover. No visible epifauna.
RC_3_0039	03:00	222.8	Medium muddy sand with silt and cobbles (5%).

RC_3_0040	03:01	222.6	Broad expanse of medium muddy sand with pebbles and cobbles (30%). A banded ophiuroid (probably *Ophiophelis acueata*) is visible at the bottom of the image; also a single squat lobster is visible under a cobble at the bottom of the image.
RC_3_0041	03:02	222.9	Medium muddy sand seabed with a single cobble (5%) present. Little visible epifauna present on the seabed other than what maybe a cup coral (centre), and some encrusting organisms (detail difficult to observe) on the cobble.
RC_3_0042	03:03	222.8	Medium muddy sand with silt coverage, with no visible epifauna.
RC_3_0043	03:04	222.7	Medium-coarse muddy sand with coarse silt coverage and small pebbles (5%) no visible epifauna.
RC_3_0044	03:06	222.3	Broad expanse of medium muddy sand with silt coverage, no visible epifauna present.

Rock_4, 10 September 2006: Total photos = 6, usable photos = 6

Photo	Time GMT	Depth m	Description
RC_4_0014	21:56	235.5	Broad expanse of mixed boulder and cobbles (70%) covering medium sand seabed. Fauna appears to be sparse with only a blue mouth redfish (*Helicolenus dactylopterus*) visible at the top of the image and the erect bryozoan *Reteporella* sp in the centre.
RC_4_0015	21:57	235.5	Broad expanse of cobbles (10%) on sand seabed. There appears to be some fauna present, but due to the camera elevation and lighting, they are difficult to identify.
RC_4_0016	21:58	235.5	Medium sand with silt coverage substrate. No visible epifauna.
RC_4_0017	21:59	235.5	Broad expanse of cobbles (20%) on sand seabed. Fauna include a number of erect bryozoan (*Reteporella* sp) and a single asteroid in the centre of the image.
RC_4_0018	22:00	235.5	Broad expanse of mixed boulders and cobbles covering 25% of the medium sand seabed. Conspicuous fauna include the holothurian *Stichopus tremulus* and a blue mouth redfish (*Helicolenus dactylopterus*) in the centre of the image. There also appear to be some encrusting fauna (probably sponges) at the top centre of the image, but due to elevation of the camera it proves difficult to identify.
RC_4_0019	22:01	235.5	Medium sand with silt coverage, numerous mounds present. No visible epifauna.

Rock_10, 12 September 2006: Total photos = 18, usable photos = 18

Photo	Time GMT	Depth m	Description
RC _10_0055	01:15	190.1	Medium sand with shell debris, a single *Melanogrammus aeglefinus* present.
RC _10_0056	01:16	189.9	Medium sand with shell debris, no visible epifauna.
RC _10_0057	01:17	190.9	Medium sand with no visible fauna.
RC _10_0058	01:18	189.9	Medium sand with no visible fauna.
RC _10_0059	01:19	190.5	Medium sand with no visible fauna.
RC _10_0060	01:20	191.4	Medium sand with no visible fauna.
RC _10_0061	01:21	191.3	Medium sand with no visible fauna.
RC _10_0062	01:23	191.3	Medium sand with shell debris, only visible fauna is a sponge.
RC _10_0063	01:24	190.4	Medium sand, no visible epifauna, other than a sea mouse on the right of the image.
RC _10_0064	01:25	190.9	Medium sand, no visible fauna
RC _10_0065	01:26	190.5	Image quality poor (exposure of light), no visible fauna.
RC _10_0066	01:27	190.9	Medium sand, no visible fauna
RC _10_0067	01:29	190.0	Medium sand, no visible fauna
RC _10_0068	01:30	190.9	Medium sand with shell debris (bivalve)
RC _10_0069	01:31	190.8	Medium sand with shell debris (bivalve)
RC _10_0070	01:40	191.2	Medium sand with no visible fauna
RC _10_0071	01:42	191.3	Visibility poor due to over exposure of light, substrate consists of cobbles covering 40% of the sand seabed. Abundance of encrusting and erect fauna attached to the cobbles, including 2 species of erect bryozoan (including *Reteporella* sp) encrusting and globose sponges. Other fauna include numerous *Caryophyllia* sp, a single squat lobster, at least two Pycnogonids and the holothurian *Stichopus tremulus*.
RC _10_0072	01:44	190.4	Medium sand with no visible fauna

Rock_11, 12 September 2006: Total photos = 26, usable photos = 26

Photo	Time GMT	Depth m	Description
RC _11_74	03:05	180.2	Medium- fine sand with slight ripples and shell debris present. No visible epifauna present.
RC _11_75	03:07	180.6	Medium- fine sand with slight ripples and shell debris present. Only visible fauna is a retracted anemone.
RC _11_76	03:08	180.4	Medium- fine sand with slight ripples and shell debris present. No visible epifauna present.
RC _11_77	03:09	180.4	Medium- fine sand with slight ripples and shell debris present. No visible epifauna present.
RC _11_78	03:10	180.0	Medium- fine sand with slight ripples and shell debris present. No visible epifauna present.
RC _11_79	03:11	180.5	Medium- fine sand with slight ripples and shell debris present. No visible epifauna present.
RC _11_80	03:12	180.7	Medium- fine sand with slight ripples and shell debris present. No visible epifauna present.
RC _11_81	03:13	180.8	Medium- fine sand with slight ripples and shell debris present. No visible epifauna present.
RC _11_82	03:14	181.1	Medium- fine sand with slight ripples and shell debris present. No visible epifauna present.
RC _11_83	03:15	181.3	Medium- fine sand with slight ripples and shell debris present. No visible epifauna present.
RC _11_84	03:17	181.1	Medium- fine sand with slight ripples and shell debris present. No visible epifauna present.
RC _11_85	03:18	180.9	Medium- fine sand with slight ripples and shell debris present. No visible epifauna present.
RC _11_86	03:19	180.4	Medium- fine sand with slight ripples and shell debris present. No visible epifauna present other than what maybe an anemone at the top right if the image.
RC _11_87	03:20	180.9	Medium- fine sand with slight ripples and shell debris present. No visible epifauna present.

RC _11_88	03:22	181.1	Medium- fine sand with slight ripples and shell debris present. No visible epifauna present.
RC _11_89	03:25	182.2	Medium- fine sand with slight ripples and shell debris present. No visible epifauna present. Image quality poor due to over exposure of light.
RC _11_90	03:26	182.4	Medium- fine sand with slight ripples and shell debris present. A single
RC _11_91	03:27	182.2	Medium-fine sand with only *Melanogrammus aeglefinus* present.
RC _11_92	03:28	182.0	Medium sand with approx 20% pebble cover. A single asteroid is visible.
RC _11_93	03:29	182.2	Medium sand with approx 20% pebble cover. A single ophiuroid is visible.
RC _11_94	03:29	182.4	Medium sand with approx 40% pebbles and shell debris cover.
RC _11_95	03:30	182.6	Medium sand with approx 20% pebble cover
RC _11_96	03:31	182.9	Medium sand with approx 20% pebble cover.
RC _11_97	03:32	182.9	Medium sand with approx 20% pebble cover. No visible epifauna.
RC _11_98	03:33	182.6	Medium sand with approx 20% pebble cover. A single ophiuroid is visible.
RC _11_99	03:34	182.3	Abundant pebbles (clinker) on sand, with approx 35% cover, a few asteroids are visible.

Rock_12, 12 September 2006: Total photos = 27, usable photos = 27

Photo	Time GMT	Depth m	Description
RC _12_0101	04:21	188.3	Medium-coarse sand with biogenic material (shell pieces and a test) only fauna are what appear to be small fish in the centre of the image.
RC _12_0102	04:23	189.0	Medium-coarse sand with biogenic material (shell pieces) and numerous mounds on the substrate. No visible epifauna.
RC _12_0103	04:24	189.8	Medium muddy sand with shell debris, as single cup coral is visible.
RC _12_0104	04:25	189.7	Medium muddy sand with abundant shell debris and mounds, an asteroid (*Stichastrella rosea*) is visible on the right of the image.
RC _12_0105	04:26	190.1	Medium sand with shell debris and a single cup coral in the centre of the image.
RC _12_0106	04:27	189.5	Medium muddy sand with abundant shell debris and no visible epifauna.
RC _12_0107	04:28	190.4	Medium sand. Over exposure of light, thus poor quality.
RC _12_0108	04:29	190.2	Medium sand with shell debris (whole and fragments) an ophiuroid is visible at the bottom of the image.

RC _12_0109	04:30	190.3	Medium muddy sand with some shell debris. At least three cup corals are visible.
RC _12_0110	04:31	190.5	Medium muddy sand with shell debris, a small eel-like fish is visible in the centre of the image.
RC _12_0111	04:32	190.4	Medium muddy sand with shell debris.
RC _12_0112	04:34	190.4	Medium sand with shell debris, over exposure of light, thus difficult to observe fauna.
RC _12_0113	04:35	190.2	Medium muddy sand with shell debris.
RC _12_0114	04:35	189.3	Medium sand with shell debris, over exposure of light, thus difficult to observe fauna.
RC _12_0115	04:36	190.3	Medium sand with biogenic material (shell and coral) with a single asteroid in the centre of the image.
RC _12_0116	04:37	190.4	Medium sand with shell debris.
RC _12_0117	04:37	190.6	Medium sand with abundant biogenic material (shell and coral).
RC _12_0118	04:38	190.6	Medium sand with abundant biogenic material (shell and coral).
RC _12_0119	04:39	190.4	Medium sand with biogenic material, two cup corals are visible.
RC _12_0120	04:39	190.7	Medium sand with shell debris, fauna visible is a single anemone (possibly *Bolocera* sp) and cup coral (*Caryophyllia* sp) in the centre of the image.
RC _12_0121	04:41	190.7	Medium sand with some shell debris.
RC _12_0122	04:43	190.5	Medium-coarse sand with shell debris.
RC _12_0123	04:44	190.8	Medium-coarse sand with shell debris, a partially buried asteroid is visible in the centre of the image.
RC _12_0124	04:45	190.9	Medium-coarse sand with shell debris, a single eel-like fish is visible in the centre of the image.
RC _12_0125	04:45	190.8	Medium-coarse sand with shell debris. Visible fauna include cup corals and a holothurian, the remaining fauna is difficult to observe due to over exposure of light.
RC _12_0126	04:46	190.5	Medium-coarse sand with shell debris.
RC _12_0127	04:47	190.2	Medium sand with abundant shell debris. A single asteroid (*Stichastrella rosea*) at least three cup corals and a possible annelid worm are visible.

Appendix 4: Photographic plates

Appendix 4.1: Photographs from Rockall Bank SEA7 survey

Plate 1: SAMS_2_L#5 image 13. © BERR.

Plate 2: SAMS_2_M#3 image 3. © BERR.

Plate 3: SAMS_2_M#3 image 21. © BERR.

Plate 4: SAMS_2_M#3 image 8. © BERR.

Plate 5: SAMS_2_M#3 image 35. © BERR.

Plate 6: SAMS_2_M#2 image 2. © BERR.

Plate 7: SAMS_2_M#2 image 11. © BERR.

Plate 8: SAMS_2_M#2 image 17. © BERR.

Plate 9: SAMS_2_O#4 image 5. © BERR.

Plate 10: SAMS_2_O#4 image 15. © BERR.

Plate 11: SAMS_2_O#4 image 14. © BERR.

Plate 12: SAMS_2_N#1 image 10. © BERR.

Plate 13: SAMS_2_N#1 image 8. © BERR.

Plate 14: SAMS_2_P#1 image 5. © BERR.

Plate 15: SAMS_2_P#1 image 10. © BERR.

Plate 16: ER-O#1 image 1. © BERR.

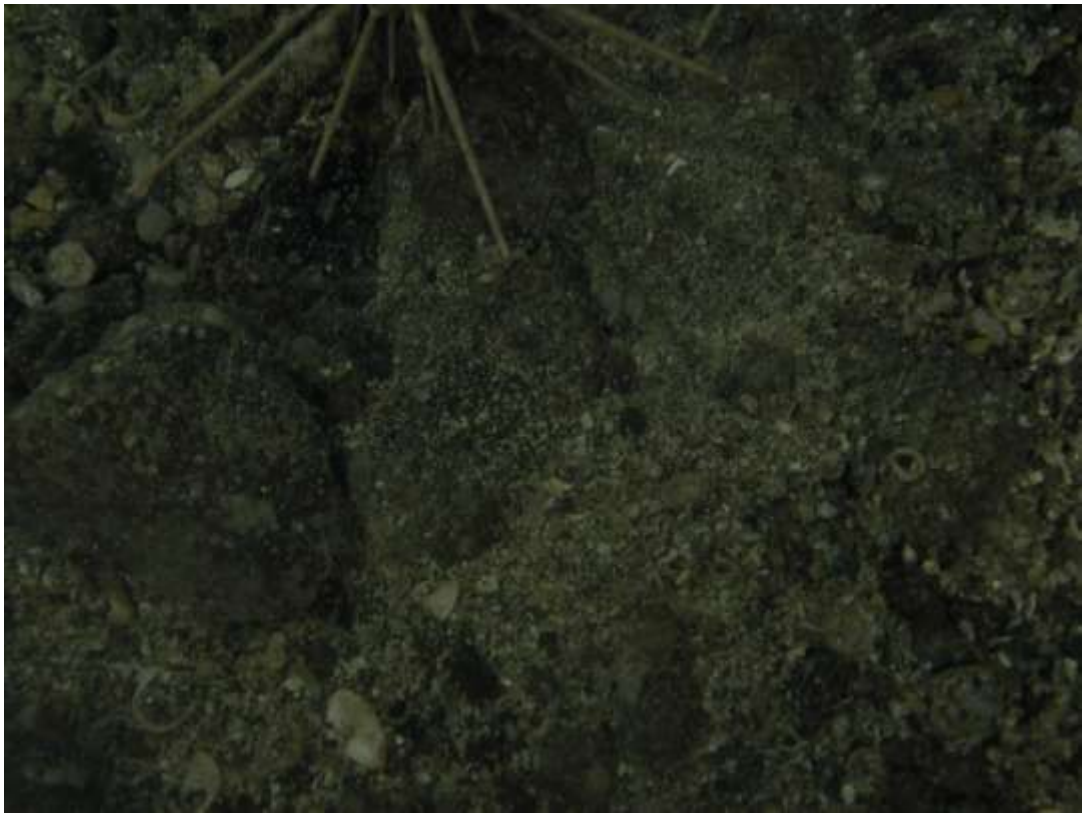


Plate 17: ER-O#1 image 4. © BERR.

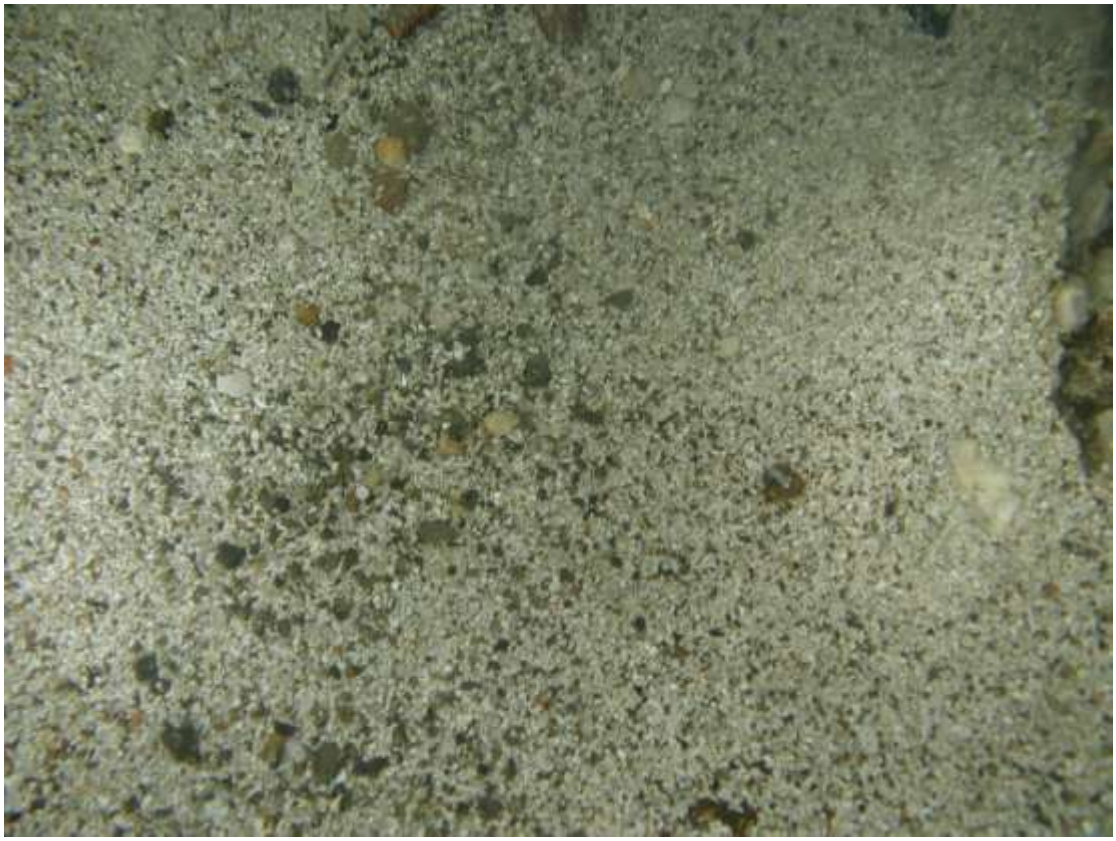


Plate 18: ER-O#1 image 75. © BERR.

Plate 19: ER-O#1 image 71. © BERR.

Plate 20: ER-M#2 image 1. © BERR.

Plate 21: ER-M#2 image 20. © BERR.

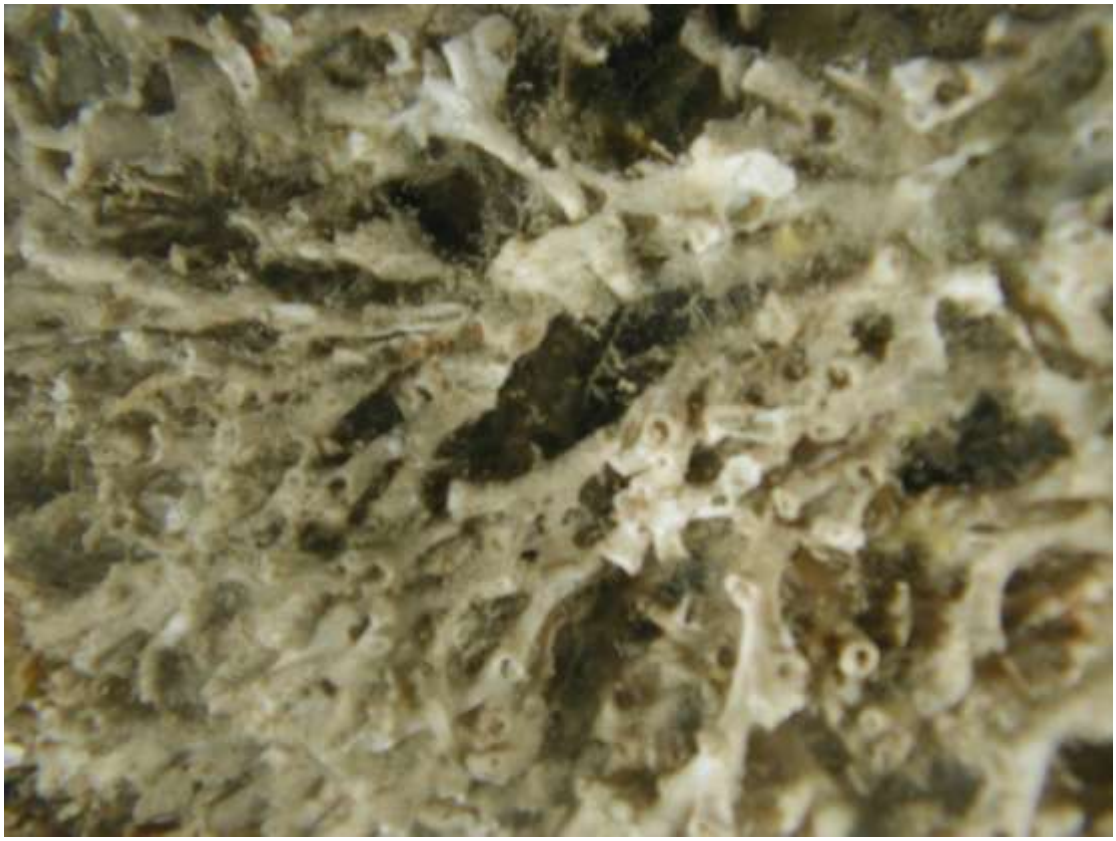


Plate 22: ER-M#2 image 17. © BERR.

Plate 23: ER-M#2 image 32. © BERR.

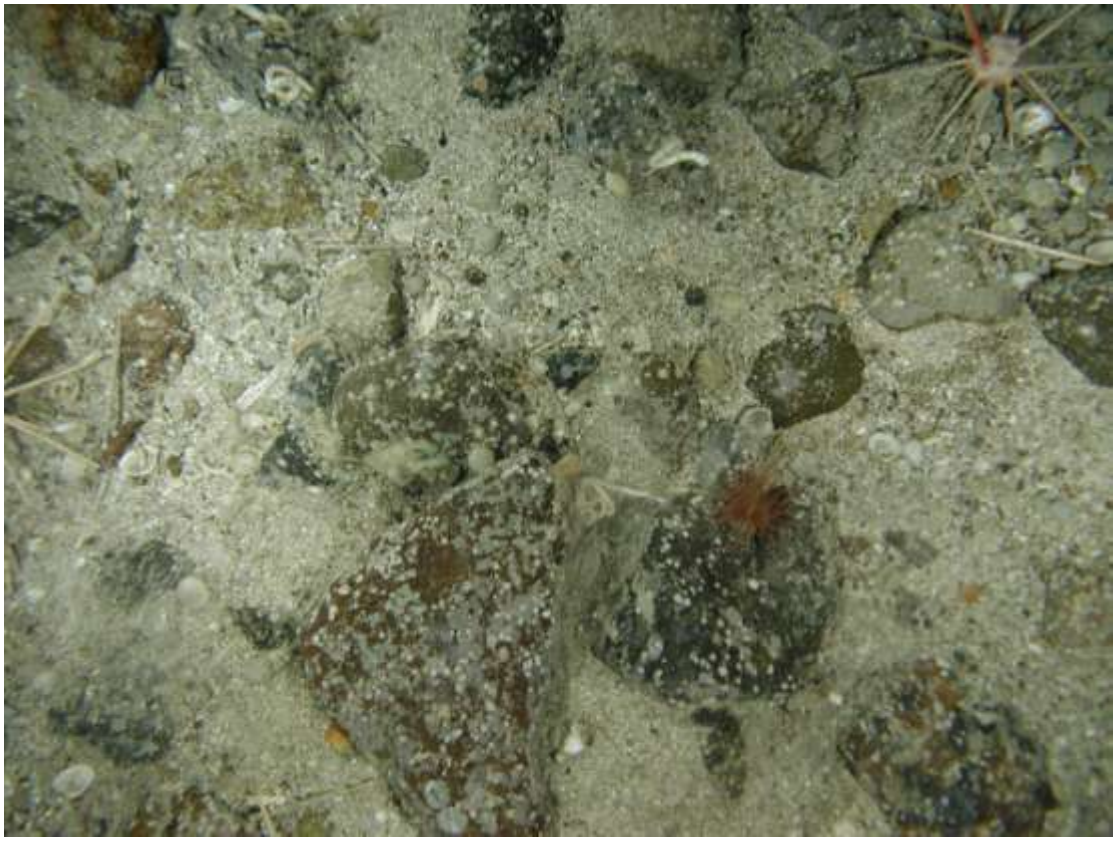


Plate 24: ER-N#1 image 32. © BERR.

Plate 25: ER-N#1 image 47. © BERR.

Plate 26: ER-N#1 image 52. © BERR.

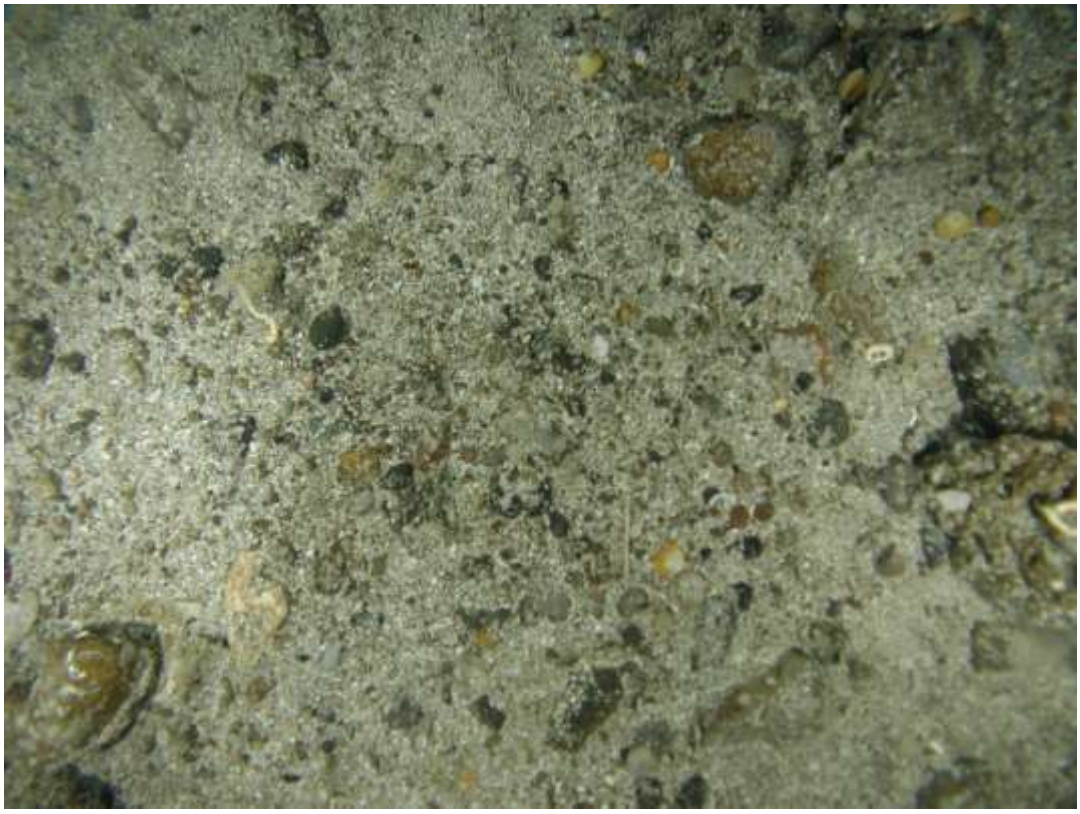


Plate 27: ER-B#1 image 3. © BERR.

Plate 28: ER-B#1 image 22. © BERR.

Plate 29: ER-B#1 image 6. © BERR.

Plate 30: ER-C#1 image 9. © BERR.

Plate 31: ER-C#1 image 10. © BERR.

Plate 32: ER-C#1 image 3. © BERR.

Plate 33: ER-D#1 image 13. © BERR.

Plate 34: ER-D#1 image 1. © BERR.

Plate 35: ER-D#1 image 4. © BERR.

Plate 36: ER-D#1 image 3. © BERR.

Plate 37: ER-F#1 image 5. © BERR.

Plate 38: ER-F#1 image 14. © BERR.

Plate 39: ER-L#1 image 12. © BERR.

Plate 40 ER-G#1 image 10. © BERR.

Plate 41: ER-E#4 image 1. © BERR.

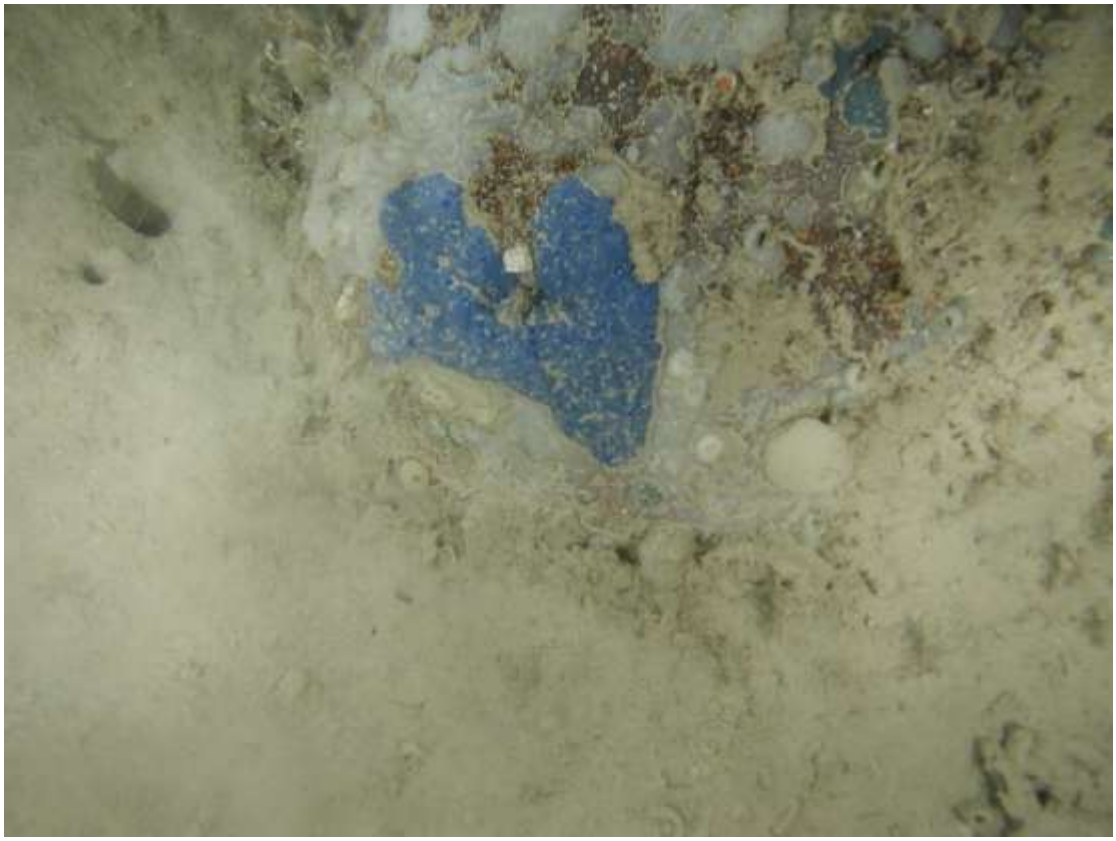


Plate 42: ER-E#4 image 4. © BERR.

Appendix 4.2: Rockall Bank FRS/JNCC stations 2005

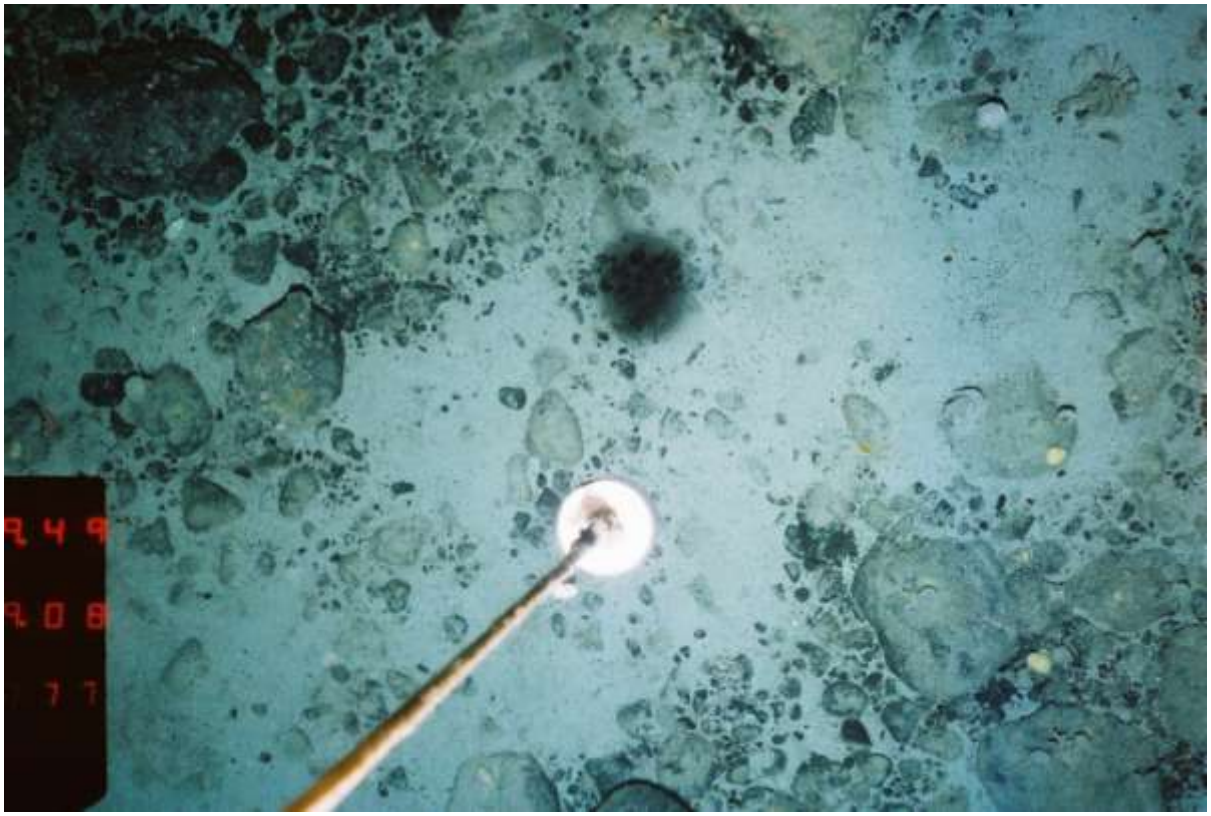


Plate 43: COR0510 image 177. © FRS/JNCC/UoP.

Plate 44: COR0510 image 181. © FRS/JNCC/UoP.

Plate 45: COR0510 image 182. © FRS/JNCC/UoP.

Plate 46: COR0512 image 206. © FRS/JNCC/UoP.

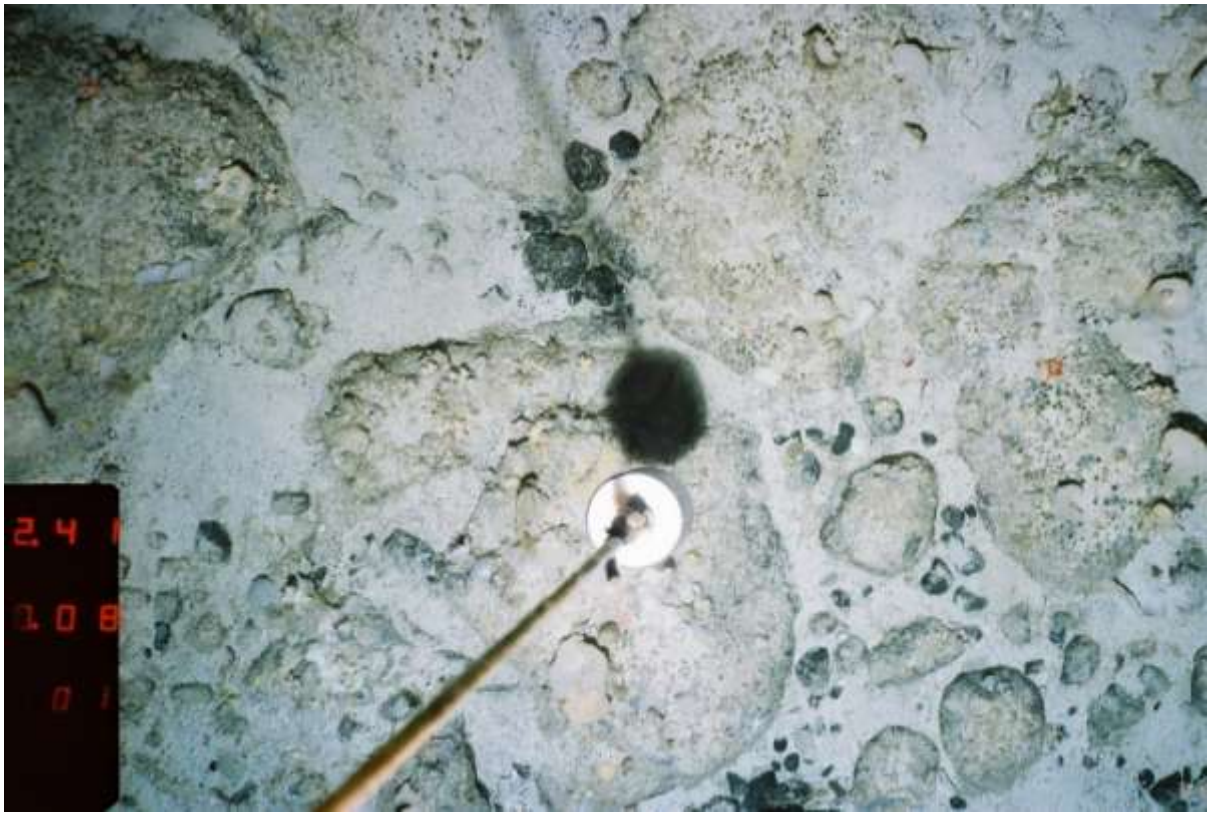


Plate 47: COR0512 image 201. © FRS/JNCC/UoP.

Plate 48: COR0512 image 208. © FRS/JNCC/UoP.

Plate 49: COR0513 image 213. © FRS/JNCC/UoP.

Plate 50: COR0513 image 215. © FRS/JNCC/UoP,

Plate 51: COR0513 image 220. © FRS/JNCC/UoP.

Plate 52: COR0513 image 216. © FRS/JNCC/UoP.

Plate 53: COR0514 image 238. © FRS/JNCC/UoP.

Plate 54: COR0515 image 50. © FRS/JNCC/UoP.

Plate 55: COR0515 image 51. © FRS/JNCC/UoP.

Plate 56: COR0516 image 66. © FRS/JNCC/UoP.

Plate 57: COR0516 image 69. © FRS/JNCC/UoP.

Plate 58: COR0516 image 71. © FRS/JNCC/UoP.

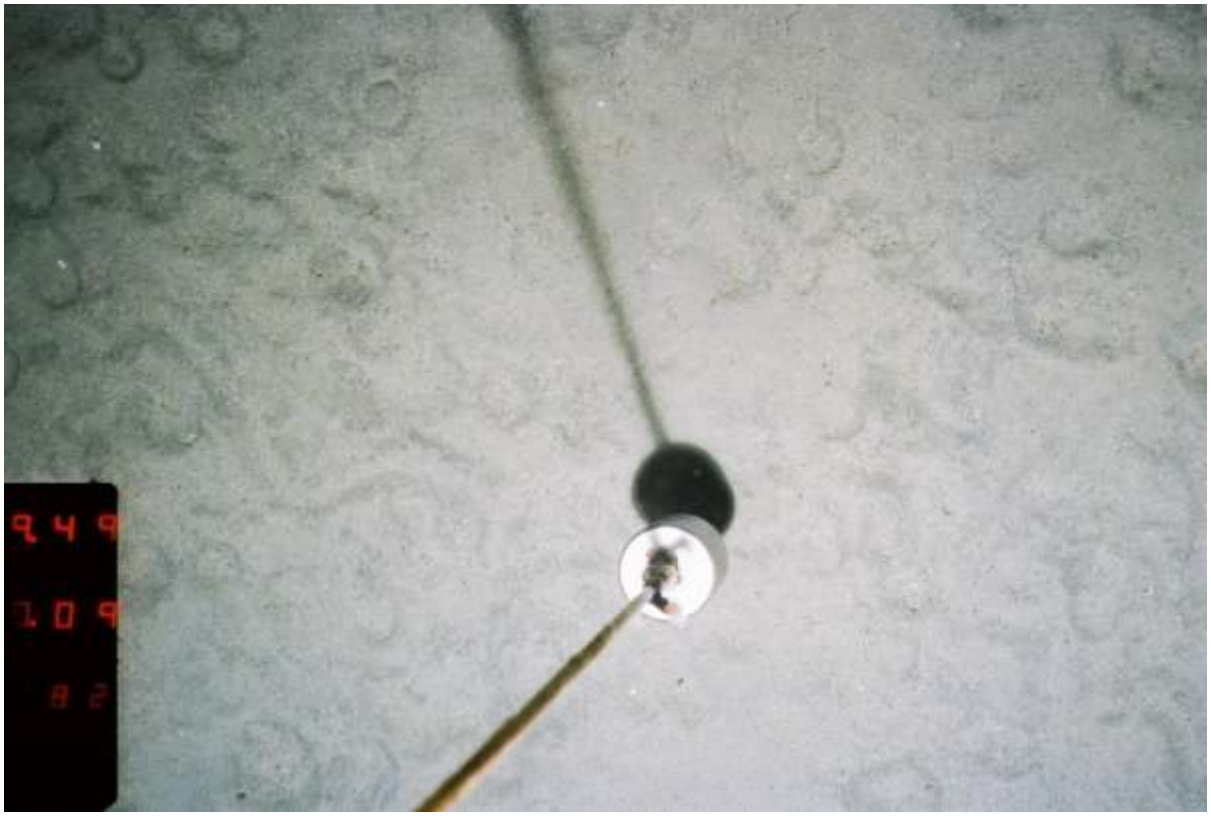


Plate 59: COR0517 image 82. © FRS/JNCC/UoP.

Plate 60: COR0517 image 83. © FRS/JNCC/UoP.

Plate 61: COR0517 image 86. © FRS/JNCC/UoP.

Plate 62: COR0509 image 11. © FRS/JNCC/UoP.

Plate 63: COR0509 image 20. © FRS/JNCC/UoP.

Plate 64: COR0507 image 181. © FRS/JNCC/UoP.

Plate 65: COR0507 image 182. © FRS/JNCC/UoP.

Plate 66: COR0502 image 52. © FRS/JNCC/UoP.

Plate 67: COR0502 image 71. © FRS/JNCC/UoP.

Plate 68: COR0502 image 67. © FRS/JNCC/UoP.

Plate 69: COR0502 image 63. © FRS/JNCC/UoP.

Plate 70: COR0503 image 87. © FRS/JNCC/UoP.

Plate 71: COR0503 image 84. © FRS/JNCC/UoP.

Plate 72: COR0503 image 86. © FRS/JNCC/UoP.

Plate 73: COR0501 image 25. © FRS/JNCC/UoP.

Plate 74: COR0506 image 149. © FRS/JNCC/UoP.

Plate 75: COR0506 image 161. © FRS/JNCC/UoP.

Plate 76: COR0505 image 114. © FRS/JNCC/UoP.

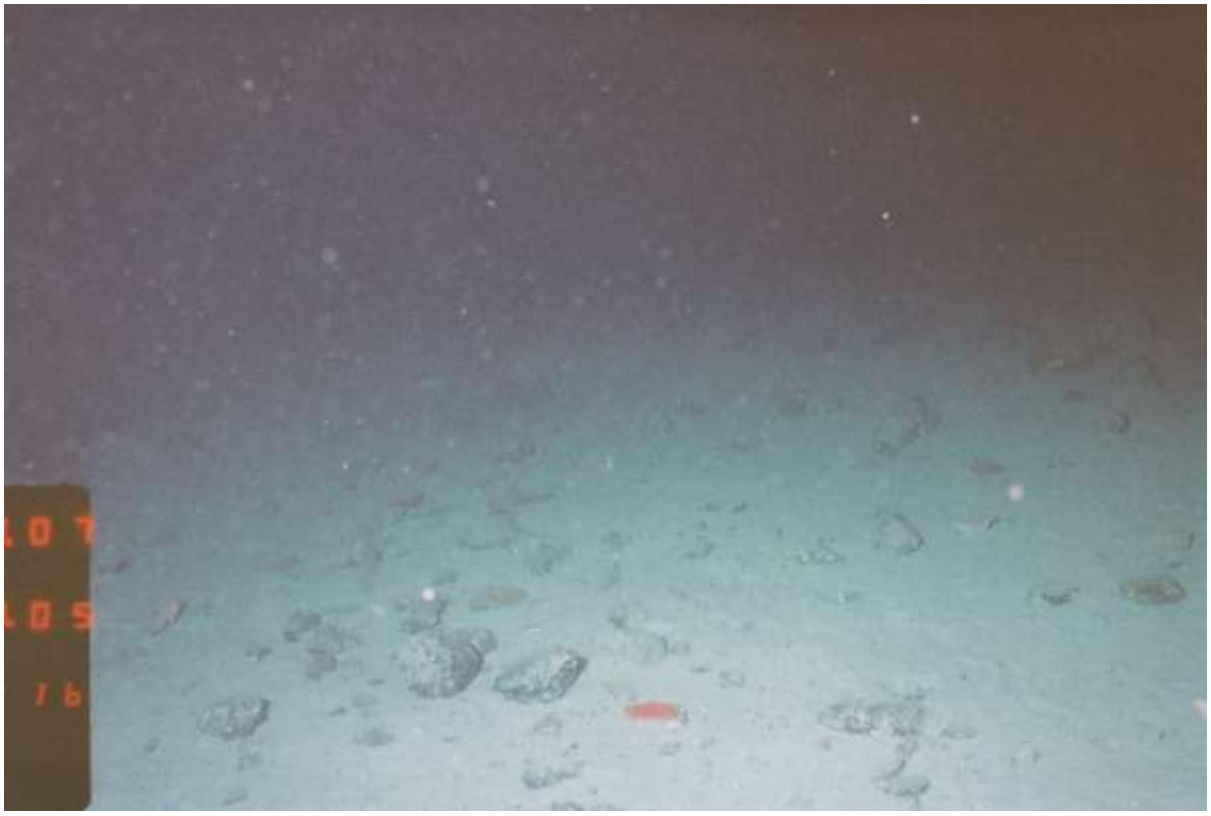


Plate 77: COR0505 image 116. © FRS/JNCC/UoP.

Plate 78: COR0504 image 106. © FRS/JNCC/UoP.

Plate 79: DW05909 image 68. © FRS/JNCC/UoP.

Plate 80: DW05903 image 49. © FRS/JNCC/UoP.

Plate 81: DW05904 image 63. © FRS/JNCC/UoP.

Plate 82: DW05905 image 67. © FRS/JNCC/UoP.

Plate 83: DW05901 image 37. © FRS/JNCC/UoP.

Appendix 4.3: Rockall Bank FRS/JNCC stations 2006

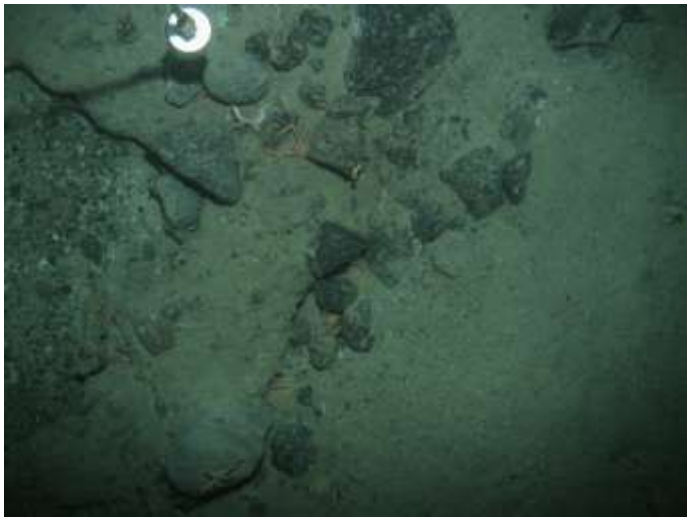


Plate 84: Rockall_3 image 31. © FRS/JNCC/UoP.

Plate 85: Rockall_4 image 14. © FRS/JNCC/UoP.

Plate 86: Rockall_10 image 71. © FRS/JNCC/UoP.

Plate 87: Rockall_11 image 94. © FRS/JNCC/UoP.

Plate 88: Rockall_12 image 120. © FRS/JNCC/UoP.