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Analysis of video and still images to characterise habitats and macrobenthos of the Wyville Thomson Ridge SCI and Faroe-Shetland Sponge Belt Scottish Nature Conservation MPA Proposal (1512S)

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Summary

Marine EcoSol was contracted by the Joint Nature Conservation Committee (JNCC) to analyse seabed imagery from an offshore survey undertaken jointly between JNCC and Marine Scotland Science (MSS) aboard the *FRV Scotia* in 2012 to the Wyville Thomson Ridge (WTR) Site of Community Importance (SCI) and Faroe-Shetland Sponge Belt (FSC[1]) Scottish Nature Conservation MPA Proposal. The current report details video and stills analysis methods employed together with major findings of interest.

The 2012 *FRV Scotia* survey to the area west of Shetland (October to November 2012) was dedicated to gathering data:

1. To facilitate fisheries management discussions in relation to the designated WTR SCI
2. To provide evidence to aid potential designation of Faroe-Shetland Sponge Belt (FSC) Scottish Nature Conservation MPA Proposal

In total, the survey undertook:

1. Twenty-nine camera-sled tows (comprising video and still images taken every 20 or 60 seconds) from the WTR SCI;
2. Twenty camera-sled tows from the FSC Scottish Nature Conservation MPA Proposal; and
3. Twelve camera-sled tows from an area labelled as FSC B near the FSC Scottish Nature Conservation MPA Proposal.

Video and still imagery aimed to better characterise the habitats and biological communities present within the survey areas and, in the case of the SCI, to provide evidence in order to facilitate management discussions. In addition, imagery allowed identification of Annex I reef subtypes and search features of the Scottish MPA project.

Four repeat camera transects were undertaken, to be compared with surveys undertaken by previous Strategic Environmental Assessment and Special Areas and Special Areas of Conservation research (SEA SAC) and the Atlantic Frontier Environmental Network (AFEN) surveys. Wherever possible Marine EcoSol aimed to analyse the imagery in a way to enable comparisons between data sets.

Wyville Thomson Ridge SCI

Within the Wyville Thomson Ridge SCI, 17.6km of transects were taken over 29 tows, with a total surveyed area of approximately 28,204m^2 of video and 729 individual still images (approximately 1.6m^2 each). Only three of the video transects were found to have two clear habitats, whilst most tows were thought to be either of a single habitat or a mosaic of two habitats, totalling 32 Marine Recorder split video samples (habitats) each analysed individually. The majority of habitats were found to be deep-sea mixed substrata (EUNIS Habitat Level 3, A6.2). Mixed substrate comprised largely of low quality reef (not diverse enough to be considered Annex 1) and mixed coarse sediments. Three habitats were dominated by boulders on the deep-sea bed (EUNIS Habitat Level 4, A6.14), whilst 11 stills were thought to show deep-sea bedrock (A6.11). Twenty two more detailed habitat names were assigned to video and stills. retain

[1] This MPA proposal was originally named “Faroe-Shetland Channel” leading to the abbreviation of FSC. The original abbreviation has been retained in this report to maintain consistency with the corresponding survey data and metadata.

Two video tows (WTR_VTR28 & 29) were found to have definite Annex 1 Reef, whilst a further video tow (WTR_VTR25) and 33 stills images were found to have potential Annex 1 Reef. Blue ling (*Molva dypterygia)* and coral gardens (offshore waters) were the only two Scottish MPA search features identified from WTR imagery. Additional species of conservation interest (for which the search included nationally rare or scarce marine species, Scottish species Priority Marine Features, Scottish and UK Species of Conservation Importance, Scottish Biodiversity List, IUCN vulnerable species, UK Biodiverstiy Action Plan, and those protected by the OSPAR Convention) identified in the area included the deep water coral *Lophelia pertusa* (a UK Species of Conservation Importance), several species of Octocorallia (Scottish Biodiversity List) and Gorgonian soft coral (IUCN Red List). WTR_VTR29 was the most taxon rich site with over 25 different taxa recorded (15.6 taxon m^{-2}).

In total, six incidences of trawl scars or marks possibly caused by trawling, otter doors or pots were seen in the Wyville Thomson Ridge SCI tows, the deepest incidence at 623m below sea level. Thirty seven incidences of litter, primarily rope and cable, were also recorded.

Faroe-Shetland Sponge Belt Scottish Nature Conservation MPA Proposal

Over 32 tows, 31.4km of video transects were taken within the Faroe-Shetland Sponge Belt Scottish Nature Conservation MPA Proposal and FSC B surrounding area in 2012. Thirty six separate video transects and 1,249 stills images were analysed over a total survey area of approximately 50,308m^2.

Four EUNIS level 3 habitats were identified within the FSC tows: deep-sea mixed substrata which dominated the video transects; deep-sea sand, present in five video tows; deep sea mud present in only one video tow; and deep-sea muddy sand, only evident in two still images.

Fifty three more detailed individual habitat names were also assigned to FSC imagery. Blue ling (*Molva dypterygia,* a UK Biodiversity Action Plan priority species*)* and deep-sea sponge aggregations were the only two Scottish MPA search features identified from FSC seabed imagery, the latter present in six videos and 67 stills images.

Additional species of conservation interest identified in the area included the Fireworks anemone *(Pachycerianthus,* a UK Biodiversity Action Plan priority species), several species of Octocorallia and Torsk (*Brosme brosme,* both on the Scottish Biodiversity List). Xenophyphore (*Syringammina fragilissima)* mounds were also indentified in densities of up to approximately 2n.m^{-2}. Potential iceberg ploughmarks (an Annex I reef subtype) were also identified in this area.

FSC B7 was the most taxon rich video tow with 28 taxa in one image (standardised to 17.5 taxon m^{-2}) and several images with more than 20 taxa in each (12.5m^{-2}). Taxa 'hotspots' with over 20 taxa per sample (12.5m^{-2}) were in FSC_B6, B7, B8, B9 & B12.

In total, nineteen possible trawl scars were seen in Faroe-Shetland Sponge Belt Scottish Nature Conservation MPA proposal tows, the deepest incidence at 519m below sea level. Nineteen additional incidences of litter, predominately rope and cable, were also recorded.

All data for the 2012 JNCC Wyville Thomson Ridge SCI and Faroe-Shetland Sponge Belt Scottish Nature Conservation MPA Proposal search areas (1512S) was entered into Marine Recorder v4.17 and ArcGIS and provided to JNCC together with this report.

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1 Introduction

Marine EcoSol was contracted by the Joint Nature Conservation Committee (JNCC) to analyse seabed imagery from an offshore survey in Scottish waters undertaken jointly by JNCC and Marine Scotland Science (MSS) staff in 2012:

1. 2012 Wyville Thomson Ridge Site of Community Importance (SCI) (entered into Marine Recorder as "2012 JNCC Wyville Thomson Ridge SCI 1512S Survey"
2. 2012 Faroe-Shetland Sponge Belt Scottish Nature Conservation MPA Proposal (entered into Marine Recorder as "2012 JNCC Faroe Shetland Channel SMPA 1512S Survey"

The survey was undertaken by JNCC and Marine Scotland Science on *FRV Scotia* in the area West of Shetland in October and November 2012. Biological data were collected using Hamon grab, rock dredge and camera drop-frame, with video and stills cameras, in order to develop an understanding of habitat distribution within the site and to facilitate SCI site management discussions. The survey also gathered additional data from nearby Scottish Nature Conservation MPA Proposal search locations for deep-sea sponge aggregations in the Faroe-Shetland Sponge Belt. Survey areas are displayed in Figure 1. The current report only presents findings of the seabed imagery aspect of the biological data.

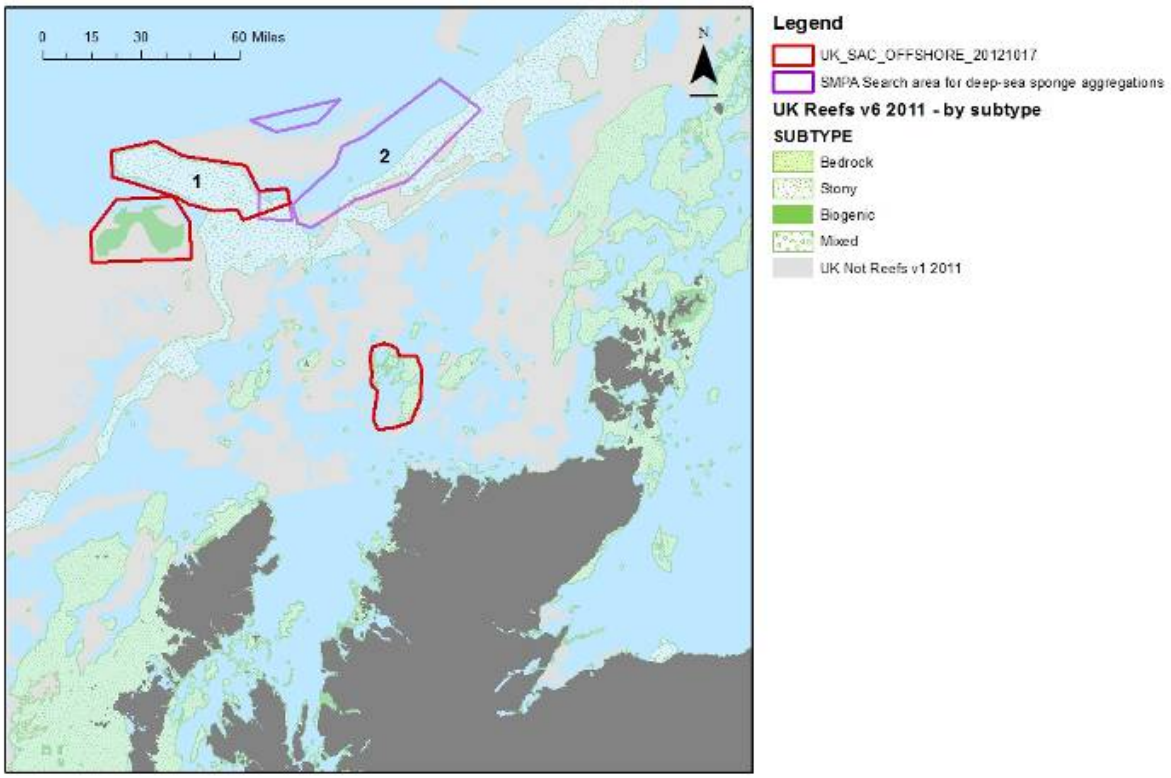


Figure 1. Overview of JNCC-MSS Wyville Thomson Ridge SCI and Faroe-Shetland Sponge Belt Scottish Nature Conservation MPA Proposal 1512S Survey region: 1) Wyville Thomson Ridge SCI and 2) Scottish Nature Conservation MPA Proposal area of search for deep-sea sponge aggregations. Map provided by JNCC.Wyville Thomson Ridge (WTR) SCI was submitted to the UK Government in August 2010 and was one of the first offshore SACs in the UK to be designated. WTR SCI has now been approved by the European Commission as a Site of Community Importance, under the Offshore Marine Conservation (Natural Habitats &c.) Regulations 2007 (as amended) (Commission of The European Community, 2007).

The Wyville Thomson Ridge is a rock ridge at the northern end of Rockall Trough rising from over 1000 metres at its deepest point to 400 metres at the summit. Along the ridge there are large areas of stony reef, thought to have been formed by the ploughing movement of icebergs through the seabed at the end of the last ice age. Bedrock reef is present on the flanks of the ridge and, due to the differences in water masses, there are different species compositions on either side. These reef communities support sea urchins, sea spiders, sea cucumbers and a range of colourful sponges and soft corals (JNCC, 2010).

As part of the Scottish Marine Protected Area (SMPA) Project, areas of search near the Faroe-Shetland Sponge Belt were also investigated during the survey (URL[1]:JNCC 2013. Scottish MPA Project). A background to the Faroe-Shetland Sponge Belt can be found in Bett (2003). The Scottish Nature Conservation MPA proposal part of the survey aims to provide advice to Scottish Ministers on the selection of MPAs under the Marine (Scotland) Act and the Marine and Coastal Access Act in the seas around Scotland. Marine Scotland is leading the Scottish MPA Project, Scottish National Heritage (SNH) is leading on advice concerning Nature Conservation MPAs within Scottish territorial waters and JNCC is leading on advice concerning Nature Conservation MPAs in offshore waters adjacent to Scotland.

In total, the 2012 *FRV Scotia* survey undertook:

4. Twenty-nine camera-sled tows (comprising video and still images taken every 20 or 60 seconds) from the WTR SCI;
5. Twenty camera-sled tows from the FSC Scottish Nature Conservation MPA Proposal; and
6. Twelve camera-sled tows from an area labelled as FSC B near the FSC Scottish Nature Conservation MPA Proposal.

Video and still imagery aimed to better characterise the habitats and biological communities present within the survey areas and, in the case of the SCI, to provide evidence in order to facilitate management discussions. In addition, imagery allowed identification of Annex I reef subtypes and search features of the Scottish MPA project.

Four repeat camera transects were undertaken, to be compared with surveys undertaken by previous Strategic Environmental Assessment and Special Areas and Special Areas of Conservation research (SEA SAC) and the Atlantic Frontier Environmental Network (AFEN) surveys. Wherever possible Marine EcoSol aimed to analyse the imagery in a way to enable comparisons between data sets.

All data for the 2012 JNCC Wyville Thomson Ridge SCI and Faroe-Shetland Sponge Belt Scottish Nature Conservation MPA Proposal search areas was also entered into Marine Recorder v4.17 and ArcGIS and provided to JNCC together with this report.

2 Methods

Video footage was collected during the survey using an Insite Pegasus 1366 standard definition colour camera on a PAL system (25 frames per second) mounted on a Marine Scotland Science (MSS) drop-frame. Both stills and video camera were downward facing. The camera frame was fitted with a standard definition stills camera, a 64 x 64mm laser grid to judge sediment size, and a hanging weight of 60mm diameter, on a 1.5m piece of rope in order to maintain 1.5m off the seabed. At 1.5m above the seabed, the field of view was approx 1.6m^2 (diagonal lens angle of the video and still cameras were 63^o and 62^o respectively). On this survey, due to a significant sea swell, the camera frame was of variable height off the seabed, so the field of view was not consistent. Furthermore, as a consequence of the rough weather, in places the footage and still images were of reduced quality, and in extreme cases not fit for purpose (therefore unuseable).

The length of video tows varied with different survey objectives, ranging from approximately 500m to 1km. Stills were taken either at 20 or 60 second intervals depending on survey objectives, with some additional images taken at points of interest. It was not possible to analyse all video and still images.

2.1 Imagery Processing

Prior to any analysis, boat logs were digitised as an audit tool. This ensured that analysts could cross-reference all date, time, positional, and habitat data to ensure that no imagery was accidently assigned to the wrong tow.

Seabed imagery required processing prior to analysis as follows.

2.1.1 Stills processing

Images (stills) were all supplied in the Joint Photographic Experts Group compressed (JPEG) format. JPEG is the preferred format for analysis to ensure that all images could be previewed quickly in Windows Explorer (thumbnail view) and that no specialist software was required to open or edit the images. Microsoft Picture Manager was used to view and edit all JPEG images for ease of opening, whilst occasionally Adobe Photoshop CS2 was used to edit very poor images.

During analysis it became clear that there were several images with the same name (which should be unique). It is recommended that in future all cameras should be set to create a unique filename for each still to avoid confusion over duplicates.

Marine EcoSol and JNCC worked together to extract relevant positional data for each still from the boat's GPS logs based on time and date stamps.

2.1.2 Video processing

All video footage was supplied on Digital Video (DV) tapes, with each tape storing multiple video tows and with some tows split between two tapes. All DV tapes were captured in real-time to PC using a Sony DV camcorder and Adobe Premiere software. The encoding system used was Phase Alternating Line (PAL). All files were output from Adobe Premiere in Audio Video Interleaved (AVI) format, ensuring that the maximum possible resolution was captured.

2.2 Imagery analysis

To ensure consistency between surveys, and prior to any analysis, the recording protocols were confirmed and practised. Marine EcoSol undertook rigorous QA to minimise avoidable inconsistencies in the datasets. This is particularly important for less familiar deep sea taxa and habitats. Inter surveyor and inter survey comparability was reduced as much as possible for this largely un-described bathyal community by training surveyors together and by using tools provided by Howell and Davies (2010).

2.2.1 Quality Assurance of Imagery Analysis

To ensure all surveyors undertook analysis and recording in the same way, and to minimise inter-surveyor variability, the first few days of analysis were used for Quality Assurance (QA) purposes. Whilst working together, the team watched and split the first few video tows and analysed the video habitat samples and several corresponding stills (following the methods laid out in 2.2.2 and 2.2.3). This aimed to ensure recording was consistent and any difficulties in species or substrate identification were highlighted and ironed out. During this initial group-scoring, a set of rules was created to overcome differences in interpretation between surveyors and therefore ensure the highest levels of recording consistency was maintained between different surveyors. Any resulting changes to pre-defined analysis and recording protocols were agreed and the recording *pro forma* updated accordingly. The resulting recording protocol was written out and a copy kept with each surveyor as a reminder.

An Excel spreadsheet was prepared (Appendix 1: Marine Recorder Excel template) to record all Marine Recorder v4.17 (MR) 'required' information, relevant MR 'optional' fields and also additional non-MR fields required for the GIS element of the project. Once all surveyors were happy with the recording protocol and data entry spreadsheet, the imagery was divided between surveyors and analysed individually. Regular discussion was maintained between the surveyors throughout analysis.

To ensure species and habitat identification was consistent between surveyors, all surveyors saved screen-grabs of taxa from stills and video, and organised these by phyla. Screen grabs were taken of both identifiable taxa and also taxa that presented ID difficulties either due to image clarity or ID uncertainty. At least once a week during the analysis stage, the surveyors spent half a day together reviewing any uncertain taxa, agreeing how to deal with them, the appropriate taxonomic level that they should be recorded to and, where appropriate, a relevant qualifier.

After the analysis stage for each survey area was complete, a minimum of 10% of video clips and stills were re-analysed by a different surveyor to ensure inter-surveyor variability was reduced to a minimum. If after reanalysis, the Quality Assurance (QA) highlighted significant (levels of magnitude of difference) inter-worker variability, the two surveyors worked together to determine where discrepancies occurred and formulated specific rules to overcome such differences for future analysis. If significant differences were identified between surveyors, an additional 10% of imagery was subject to further QA using the same process and surveyors agreed on whether re-analysis was necessary or whether any consistent errors could be corrected post analysis (for instance, in consistent misnaming of one taxa). The qualifiers of some taxa were changed as part of quality control to ensure consistency following surveyor discussions at the end of the contract, whilst some taxa were merged (for instance, where several different encrusting sponges were the same sponge at different exposure levels), prior to Marine Recorder (MR) data entry.

As with the initial imagery analysis, Excel spreadsheets were used to audit which data was reanalysed for QA purposes and by whom. Recorded within the audit spreadsheets was the date of QA, the name of the QA surveyor, QA reanalysis results, comments relating to differences in results between surveyors, and any remedial actions undertaken.

2.2.2 Video analysis

Analysis of video clips required each clip to be viewed three times as follows:

i. The first view of video clip (prior to stills analysis):

The first stage of image analysis required all video clips be viewed once in real time or upto 2x speed and split into habitats based upon broad changes in substrate composition and associated fauna. Resulting habitat splits were aimed at EUNIS level 3 (or higher) habitat type. During this view the following were noted:

1. Event description (summary of main habitat characteristics; where appropriate using Folk (1954) & Long (2006) methods to classify sublittoral sediments).
2. Basic habitat description ('Habitat Name' fewer than 100 words, based loosely on a list of standards developed throughout the project and where appropriate using Folk (1954) & Long (2006).
3. Whether the video was of suitable quality for assessing the habitat and fauna.
4. Start and end times, date, depths and GPS positions for the video clip.
5. A visual assessment of the substrate composition (% MNCR substrate type).
6. Where habitat is dominated by rock, a semi-quantitative assessment of rock features, using the MNCR 1 to 5 scale for each feature; a record of the presence of other MNCR rock features such as 'Sediment on Rock' and 'Boulders / Cobbles on Sediment'; and a record of the percentage of rocky seabed that fell within each of the five MNCR inclination categories

   OR

   Where dominated by sediments, a semi-quantitative assessment of sediment features, using the MNCR 1 to 5 scale for each feature and a record of the presence of other MNCR sediment features such as 'Mounds or Casts', 'Burrows or Holes', 'Tubes', 'Waves', and 'Ripples'.

Results from video analysis were made directly into the spreadsheet.

Where video tows comprised multiple habitats, videos were split in Adobe Premier and the filename of each resulting video clip was renamed yyyymmdd_FSC/WTR#_VHab1 or VHab2 to indicate, firstly that it is a video file, and secondly the habitat (sample) number within the video tow. The filename was then used as the unique sample reference throughout analysis and data entry.

Once all video had been split into habitats, the corresponding stills were also divided using the habitat start and end times from the video, and the 'image created' time, from the file properties for the photographs.

ii **The second view** of the video clip included recording (after stills analysis, detailed in 2.2.3):

7. Annex 1 reef habitat subtypes (see section 2.4 for detail)
8. Scottish MPA project search features (as described in Appendix 2). Deep sea sponge aggregations were allocated where large Demospongiae reached densities of over $0.5m^{-2}$, following the OSPAR definition (OSPAR Commission 2010).

9. Species of conservation interest. These included any species mentioned in the following lists: Scottish UK Species Conservation Importance and Priority Marine Features (Moore & Roberts, 2011), Scottish Biodiversity List, UK Biodiversity Action Plan priority species or habitats, UK Species of Conservation Importance, Nationally rare or scarce marine species (UK), IUCN Red List vulnerable species (URL[5]: The IUCN Red List) and any species protected by the OSPAR Convention (OSPAR Commission, 2008).
10. Any visible impacts or other modifiers, including trawl marks, discarded fishing gear, litter, visible physical damage, evidence of strong currents.
11. Identifying, quantifying and recording all taxa to the lowest possible taxonomic level using either the SACFOR scale together with MNCR abundance guidance (Connor & Hiscock, 1996), or counts either where the SACFOR scale was deemed inappropriate or to remain comparable to previous surveys. When identification of fauna was uncertain, a higher classification was used. In cases where taxa could not be identified to a specific genus or species, a higher taxonomic classification was used and additional descriptive information was included with details of life-forms present in less than 10 characters in the 'qualifier' field. More information on the identification of taxa has been provided in section 2.3.

iii **The third non-stop view** of the video clip:

12. Review all data to ensure sediment composition, species abundance and habitat description all made sense when viewed as a whole.
13. Assign EUNIS habitats and JNCC biotope(s) to the habitat as described in section 2.5.

2.2.3 Stills analysis

Full still image sets, of stills taken every 20 seconds, were analysed for at least six full tows of each different broad habitat. Full tows analysed included the four repeat transects from SEA and AFEN surveys.

Capture protocol for stills imagery was variable (either at 20, 40 or 60 second intervals). JNCC advised that sub-sampling was appropriate for some camera tows. Sub-samples were taken for homogenous substrates based on an initial scan of the images for a given tow (sand, mixed substrates and low quality stony reef with low species richness). The full image set was reviewed to determine the number of stills required to appropriately assess the habitat. For instance, in the case of a patchy habitat of coarse mixed sediments with rare boulders, images were split by habitat to ensure that the sub-sampled image set was representative of the overall habitat (e.g. where only 10 in 80 images contained boulders, only one image analysed would be a boulder and at least seven would be coarse mixed sediment). At least 10% of images were sub-sampled for each tow, but if it was deemed that this may not have sufficiently captured the characterising species of the habitat, then a further 10% of images were analysed.

Recording of image analysis was in digital format into the data entry spreadsheet, although each analyst kept a scratch pad on their desk for taxon counts. The filename of each image (including the video tow and image number) was used as unique sample reference for all analysis and data entry. All stills corresponding to a single video sample were analysed consecutively prior to analysis of the video clip.

Analysis of each still required the following process:

1. Briefly describing the habitat in one sentence.
2. Recording whether the still was usable for assessing both the habitat and any fauna.
3. Recording the time, date, depth and GPS position the photo was taken.
4. Visually assessing the substrate composition using percent cover for each MNCR substrate type.
5. Recording the type of any Scottish MPA project search feature, any Annex 1 reef habitat, or species of conservation concern (as described in sections 2.2.2 and 2.4 respectively)
6. Where the habitat is dominated by rock, semi-quantitatively assessing rock features, using the MNCR 1 to 5 scale for each feature; recording the presence of other MNCR rock features such as 'Sediment on Rock' or 'Boulders / Cobbles on Sediment'; and recording the percentage of the rocky seabed that fell within each of the five MNCR inclination categories.

   OR

   Where dominated by sediments, semi-quantitatively assessing sediment features, using the MNCR 1 to 5 scale for each feature and recording the presence of other MNCR sediment features such as 'Mounds or Casts', 'Burrows or Holes', 'Tubes', 'Waves', 'Ripples'.
7. Recording the presence of any visible impacts or other modifiers, including trawl marks, discarded fishing gear, litter, visible physical damage, evidence of strong currents.
8. Identifying, quantifying and recording all taxa to the lowest possible taxonomic level using either the SACFOR scale together with MNCR abundance guidance (Connor & Hiscock, 1996), or counts either where the SACFOR scale was deemed inappropriate or to remain comparable to previous surveys. When identification of fauna was uncertain, a higher classification was used. In cases where taxa could not be identified to a specific genus or species, a higher taxonomic classification was used and additional descriptive information was included with details of life-forms present in less than 10 characters in the 'qualifier' field. More information on the identification of taxa has been provided in section 2.3.
9. Assigning a biotope to the still as described in section 2.5.

2.2.4 Taxon (species) Richness

Taxon richness was calculated as all individual taxa, or 'species' as entered into Marine Recorder, including all species, individual morphotypes, groups of species or genera with qualifiers within a sample (single video habitat or stills image). This information was entered into the Sample Description box in the data entry template. In addition to recording all individual encrusting Porifera and Bryozoan taxa, surveyors were also asked to consistently record the overall abundance of 'all' Porifera and Bryozoa crusts (to ensure that their overall presence was recorded if individual taxon were not).

It was not possible to assess species diversity within the scope of the current contract, as this requires consistent count information for all taxa.

2.3 Identification of taxa and assessing their abundance

2.3.1 Classification of taxa

Consistent identification of deep sea epibenthic taxa from imagery is more challenging than their shallow counterparts due to limited resources and lack of specimen collections. All surveyors are experienced scientific divers, used to seeing a range of circalittoral species *in situ*, and three out of four of the analyses team had previous experience of survey from the Rockall Bank, North Sea, and Rona-Windsock area.

To avoid confusion between several species of Porifera and Bryozoan crusts, before trying to distinguish between each species, ALL crusts were noted. This information was used if individual crusts were not deemed comparable and could not be combined due to the use of the SACFOR scale.

All taxa and abundance analyses aimed to be comparable with previous SEA (DTIU 2003 & 2007) and AFEN (Axellson 1998) surveys. As a result, the Howell & Davies Deep Sea Imagery catalogue (2010) was consulted to ensure consistent classification and comparable counts were used wherever possible. Where there was agreement between the Marine EcoSol team and Howell's taxa they were entered either as the same species, or, if described, into the Qualifier column of Marine Recorder. For example: Porifera Encrusting Sp.1 was entered into Marine Recorder as Porifera with the qualifier 'Enc Sp 1'. Any additional taxa not identified from Howell's catalogue were alphabetised in the qualifier field, to distinguish between Howell and Marine EcoSol taxa. All 'qualified' taxa and images were logged within the accompanying Species Log.xls. The following deep sea image catalogues were also used to inform classification: Deep Sea Conservation.org, Lophelia.org and the Deepseascape.org (URLS[2-4]).

When identification of fauna was uncertain, a higher classification was used. In cases where taxa could not be identified to a specific genus or species (as with many Porifera where samples are absent), a higher taxonomic classification was used and additional descriptive information was included with details of life-forms present in less than 10 characters in the 'qualifier' field. Quality assurance and a close working team during image analysis, together with quality control post analyses (section 2.2.1) aimed to ensure consistent recording of the same taxa both between current and previous surveyors.

2.3.2 Quantification of taxa

The contract specified that all recording should be quantified using the SACFOR scale. However *"SACFOR recording should be undertaken over an extended area of the habitat, rather than being restricted to a quadrat or strictly defined transect, to ensure more widely spaces aspects of the habitat and its species recorded"* (Connor & Hiscock 1996), and is therefore not always appropriate for recording from photographic stills of an area 1.6m^2.

The current contract also required analysis to be undertaken in a way that was comparable to previous surveys. Therefore, following discussions with JNCC project officers, either SACFOR scale was used in conjunction with MNCR abundance guidance where appropriate, or counts where the SACFOR scale was deemed inappropriate or to remain comparable to previous surveys (Howell & Davies 2010), as detailed in Table 1.

In summary, counts were taken for large individuals not forming a colony where SACFOR was deemed inappropriate (Cnidaria, Annelida, Crustacea, Echinodermata, Pisces).

Table 1. Method of quantification used in analysing different taxa for 2012 Wyville Thomson Ridge SCI and Faroe-Shetland Sponge Belt Scottish Nature Conservation MPA Proposal seabed imagery. This list is not exhaustive and further detail should be sought from the 2012 Species ID Log.xls.

Taxa	Description	Scale used
Syringammina fragillissima		SACFOR
Porifera	All crusts	SACFOR
Porifera	All mass	SACFOR
Cnidaria	Large individuals (where not forming dense cover)	Count
Actiniaria	Others	Count
Alcyonacea	Others	SACFOR
Scleractinia	Colony	SACFOR
Scleractinia	Small individuals	Count
Annelida	Large individuals	Count
Serpulidae		SACFOR
Paguridae		Count
Pycnogonida	All	Count
Anomiidae		SACFOR
Polyplacophora		Count
Brachiopoda		Count
Bryozoa	All crusts	SACFOR
Bryozoa	Large solitary	Count
Echinodermata		Count
Ophiuridae	Dense small brittlestars	SACFOR
Ophuiridae	Arms	SACFOR
Tunicata	Large solitary	Count
Pisces		Count

2.4 Delineation of Annex I reef sub-types

Definitions of Annex 1 reef habitats were assigned to stills and video clips using information and definitions from CEC (2007), Blythe-Skyrme *et al* (2008) and Irving (2009).

Annex 1 reef was assigned to any 'high quality' reef (Irving 2009) observed, and to any medium quality reef with live *Lophelia pertusa* habitat subtype.

Where 'medium quality' reef (Irving 2009) was encountered, it was assigned as 'potential' Annex 1 reef.

Subsequently, 'low quality' stony reef (Irving 2009) was not allocated Annex 1 status, but instead noted in a separate data row and mentioned in sample descriptions when entered into Marine Recorder.

Reef habitat included hard, compact substrata, comprising biogenic concretions (biogenic reef), or substrata of geogenic origin, comprising bedrock (bedrock reef) or boulders and cobbles (stony reef). To be classed as Annex 1 reef habitat, the hard substrata had to be topographically distinct from the surrounding solid or soft seafloor, and had to be greater in area than $25m^2$ (an area of 5m x 5m). To be assigned as stony reef, the area required greater than 10% (more typically 40%) cover of boulders and cobbles, and the majority of any fauna present had to be dependent upon the hard substrata rather than any sediment elements of the seafloor.

2.5 Habitat type and biotope assignment

Habitats (EUNIS level 3) or biotope complexes (EUNIS level 4) were assigned to stills and video clips using information from EUNIS guidance (Davies et al, 2004). Marine Habitat Classification for Britain & Ireland (v04.05, Connor et al, 2004) was not applicable to offshore biotopes, and could therefore not be assigned to the 2012 seabed imagery.

Areas with two or more biotopes mixed together, interspersed or regularly repeating, such as with waves of coarse and then fine sediments, were defined as being a mosaic of all contributing habitats/biotopes.

Scottish MPA project search features (detailed in Appendix 2) were also assigned to stills and video samples during analysis.

2.6 Marine Recorder v4 Data entry

During methods discussions, prior to analysis, an Excel spreadsheet was prepared (Appendix 1) to record all Marine Recorder v4.17 (MR) 'required' information, all relevant MR 'optional' fields and also several additional non-MR fields required for the GIS. Fields within the Excel spreadsheet were arranged in the same order as data is entered into MR therefore ensuring data entry was as quick and straightforward as possible.

Data from each distinct survey area was entered into MR corresponding to a separate MR survey, each with a separate MR location. Survey and location boxes were drawn up in the GIS prior to data entry. Each video tow represented a MR event and each video clip demonstrating an individual habitat (aimed at EUNIS level 3 or higher) corresponded to a MR sample. Additionally each photograph also corresponded to a MR sample.

As EUNIS habitats, Annex 1 reef, Scottish MPA Search features, species of conservation importance, litter, trawl marks, and taxon richness do not have fields in Marine Recorder, they have been entered into the sample descriptions (for each individual stills image or video habitat).

2.6.1 Marine Recorder data entry QA

When preparing Excel data entry spreadsheets for import into GIS and entry into Marine Recorder v4 (MR), a thorough process of data cleaning was undertaken to ensure the quality of data within these formats. Data cleaning included using: the 'Spell Checker' to ensure spelling mistakes were removed; the 'Find and Replace' function to remove any unwanted spaces or other characters; and Excel 'text string' and 'value' functions & calculations to validate data types within text and value specific fields.

Upon completion of MR data entry a minimum of 10% of MR samples were compared with cleansed (post QA and QC) recording sheets. Where any differences between original and final formats were identified, remedial action was taken to ensure data quality. If frequent and consistent errors were identified, the data was explored to identify any data entry or data import systematic errors. Excel spreadsheets were used to audit which samples were checked and any remedial actions undertaken.

MR validation matrices and Snapshots were utilised to find any gaps among events where data had been missed accidently. These were then populated.

3 Results

The following section describes results from the analysis of video and stills from the offshore Scottish towed video survey undertaken. For the purposes of Marine Recorder data entry, data were split by the two separate survey aims:

1. 2012 Wyville Thomson Ridge Site of Community Importance (SCI) (entered into Marine Recorder as "2012 JNCC Wyville Thomson Ridge SCI 1512S Survey"
2. 2012 Faroe-Shetland Sponge Belt Scottish Nature Conservation MPA Proposal (entered into Marine Recorder as "2012 JNCC Faroe Shetland Channel SMPA 1512S Survey"

JNCC provided Marine EcoSol with 3500 stills images and 61 video tows, which were to be split by habitat and individually analysed, with each useable video habitat or still analysed and entered as a sample into Marine Recorder. Eleven weeks were allocated to achieve this with four full time surveyors (Liz Morris, Melanie Harding, Lin Baldock and Thomas Stamp). Sub-sampling was utilised in homogenous non-target habitats. Where ever possible at least six tows were fully analysed at 20 second stills intervals for each new habitat found. In total, 1975 individual stills and 68 video habitats were entered as 2043 samples (split video habitats and stills) into Marine Recorder, within 61 events (imagery tows), under two surveys (1 and 2 above). Table 2 summarises the Annex 1 reef habitat, Scottish MPA search features and any species of conservation interest identified in each survey area.

Table 2. Annex 1 Habitats, Scottish MPA Search Features and Species of Conservation Concern were found at the Wyville Thomson Ridge SCI and Faroe-Shetland Sponge Belt Scottish Nature Conservation MPA proposal.

	Annex 1 Reef Present		MPA Search Features Identified			Species of Conservation Interest						
	Definite	Potential	Potential coral gardens (offshore waters)	Deep sea sponge aggregations	Blue Ling (*Molva dypterygia*)	Blue Ling (*Molva dypterygia*)	*Lophelia pertusa / Madrepora oculata*	Octocorallia	Gorgonacea	*Pachycerianthus*	Torsk (*Brosme brosme*)	Tows with multiple Species of Conservation Interest
Wyville Thomson Ridge SCI	WTR_VTR 29 & 29	WTR_VTR 14 & 25	WTR_VTR 29	None	WTR_VTR 8, 16, 17, 18, 19, 20,	see previous	WTR_VTR 14, 26 & 28 (possible alive	WTR_VTR15, 16 & 29	WTR_VTR6	None	None	VTR16 & 28
Faroe Shetland Channel SMPA	None	FSC_15, 16	None	FSC_B5, B7, B8, B9, B10, B11 (Potential in FSC_B6, B15,	FSC_01, 03, 04, 05, 08, 10, 13, B4, B5,	see previous	None	FSC_B9	None	FSC_16	FSC_18	None
	Annex 1 Reef Present		MPA Search Features Identified			Species of Conservation Interest						
	Definite	Potential	Potential coral gardens (offshore waters)	Deep sea sponge aggregations	Blue Ling (*Molva dypterygia*)	Blue Ling (*Molva dypterygia*)	*Lophelia pertusa / Madrepora oculata*	Octocorallia	Gorgonacea	*Pachycerianthus*	Torsk (*Brosme brosme*)	Tows with multiple Species of Conservation Interest
Wyville Thomson Ridge SCI	WTR_VTR 29 & 29	WTR_VTR 14 & 25	WTR_VTR 29	None	WTR_VTR 8, 16, 17, 18, 19, 20,	see previous	WTR_VTR 14, 26 & 28 (possible alive	WTR_VTR15, 16 & 29	WTR_VTR6	None	None	VTR16 & 28
Faroe Shetland Channel SMPA	None	FSC_15, 16	None	FSC_B5, B7, B8, B9, B10, B11 (Potential in FSC_B6, B15,	FSC_01, 03, 04, 05, 08, 10, 13, B4, B5,	see previous	None	FSC_B9	None	FSC_16	FSC_18	None

3.1 Wyville Thomson Ridge SCI

3.1.1 Summary of seabed imagery analysed

In total over 17.6km of video transects were taken over 29 tows within the Wyville Thomson Ridge SCI in 2012, with a total surveyed area of approximately 28,204m^2. Figure 2 shows the locations of the 2012 WTR transects.

Twenty six of the 29 seabed imagery transects captured photographic stills every 20 seconds, although only 12 of these were fully analysed due to lac of heterogeneity. WTR_VTR27a was not of high enough quality for analysis. Seven hundred and twenty nine individual images were analysed. Table 3 provides a breakdown of each seabed imagery transect. Only three of the video transects were found to have two clear habitats, whilst most tows were thought to be either of a single habitat or a mosaic of two habitats, totalling 32 split video samples (habitats) analysed individually.

Appendix 3 presents a fuller summary of each WTR seabed imagery transect.

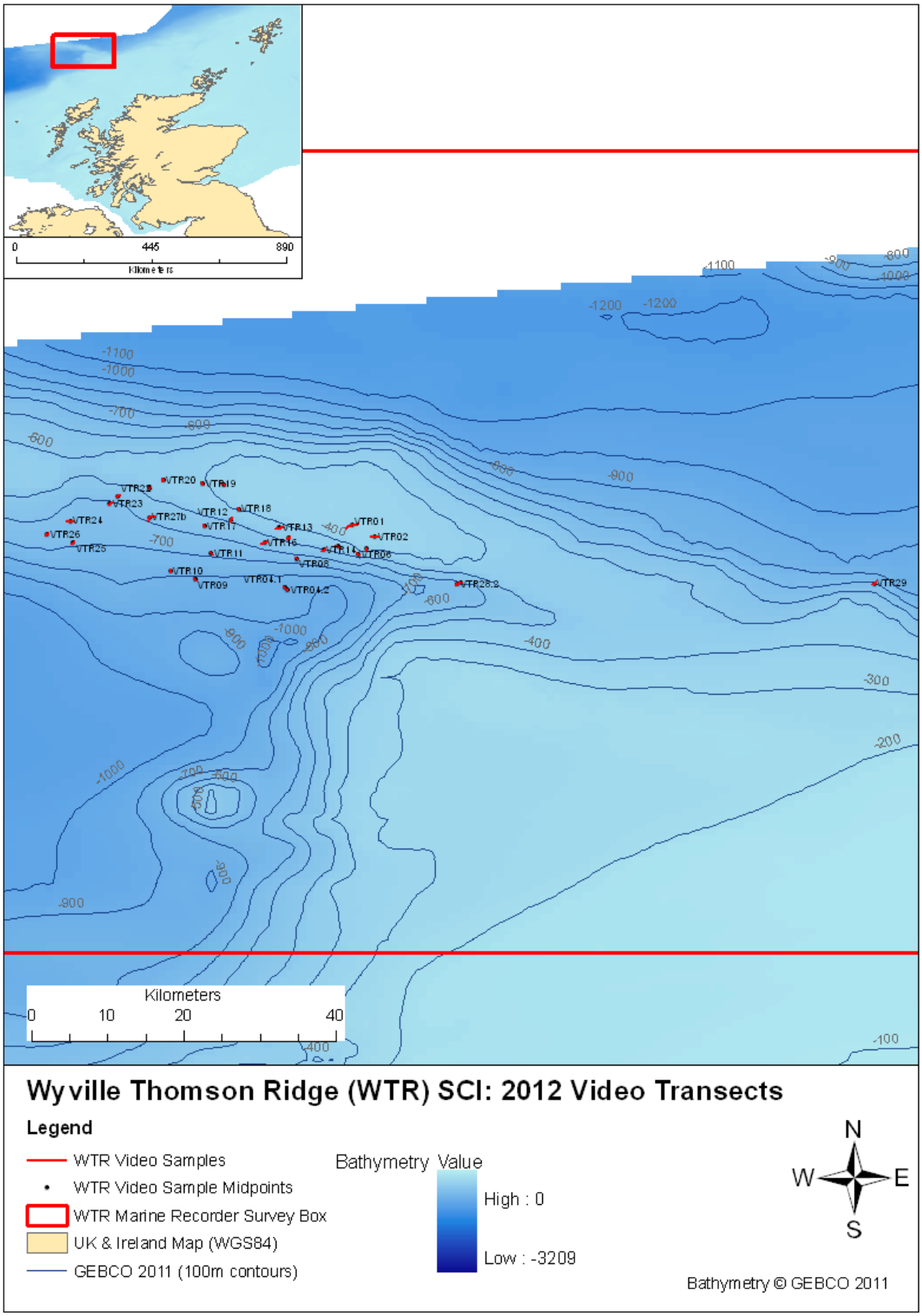


Figure 2. Map showing the location of the 2012 Wyville Thomson Ridge SCI survey area off Scotland showing individual video samples (WTR Video Polylines) and video sample centre points (WTR Video Points). Photo samples (WTR Stills Points) were analysed from all stations however are not visible at the current map scale.

Table 3. Summary of each WTR tow and the number of video and photographic stills samples provided and analysed within each. 12 tows (emboldened) where stills were taken every 20 seconds were fully analysed, whilst others were subsampled [!]Some stills were not analysed due to poor quality, others due to sub-sampling. R* Repeat transects of SEA SAC 4 & 7 surveys (DTI 2003 & 2007). 27a was not of high enough quality for analysis.

WTR Tow	Position Start	Position End	Length of Tow (m)	Approx area (m^2) of tow analysed	Stills interval (secs)	Total No. of Stills taken	No. of stills analysed[!]	No. of video habitats analysed
VTR1	59.9387 -6.0631	59.93315 -6.0799	1350	2160	20	218	22	2
VTR2	59.923016 - 6.037066	59.923966 - 6.048333	633	1013	20	59	6	1
VTR3	59.9831 - 6.051866	59.98665 - 6.059016	621	994	60	43	5	1
VTR4	59.86483 - 6.15133	59.860533 - 6.145583	651	1041	20	80	8	2
VTR5	59.91145 - 6.053316	59.906866 - 6.054016	521	834	20	48	5	1
VTR6	**59.904483 - 6.065166**	**59.9008 -6.059716**	**528**	**845**	**20**	**46**	**44**	**1**
VTR7	59.913166 - 6.091116	59.91045 -6.08265	554	887	20	46	5	1
VTR8	**59.899883 - 6.636683**	**59.895883 - 6.633566**	**503**	**806**	**20**	**52**	**46**	**1**
VTR9	59.875333 - 6.090583	59.870983 - 6.08655	551	882	20	52	6	1
VTR10	59.885766 - 6.1169	59.88105 - 6.117216	542	868	20	48	5	1
VTR11	59.906133 - 6.07145	59.868683 - 6.067583	493	790	30	37	4	1
VTR12	59.9461 -6.04445	59.940833 - 6.045566	736	1178	20	67	67	1
VTR13	**59.935983 - 6.150816**	**59.932533 - 6.160166**	**653**	**1045**	**20**	**49**	**45**	**1**
VTR14	**59.909616 - 6.10025**	**59.906266 -6.1065**	**507**	**812**	**20**	**60**	**58**	**1**
VTR15	**59.923933 - 6.1425**	**59.920416 - 6.148016**	**475**	**760**	**20**	**53**	**48**	**1**
VTR16	**59.918216 - 6.001333**	**59.914966 - 6.011433**	**672**	**1076**	**20**	**77**	**73**	**1**
VTR17	59.938366 - 6.0782	59.93375 - 6.076733	623	997	20	42	5	1
VTR18	59.954183 - 6.035816	59.9582 -6.0387	483	773	20	46	8	1
VTR19	59.983866 - 6.077983	59.988416 - 6.080666	523	837	20	57	9	1
VTR20	59.98805 -6.127	59.9927 -6.127	525	840	20	30	9	1
VTR21	**59.97945 - 6.142083**	**59.9838 -6.140683**	**491**	**785**	**20**	**41**	**31**	**2**
VTR22	59.969 -6.01465	59.9738 -6.0105	596	954	20	48	5	1
VTR23	**59.9645 -6.01935**	**59.960566 - 6.024916**	**549**	**879**	**20**	**43**	**38**	**1**
VTR24	59.942616 - 6.06495	59.941433 - 6.073933	548	877	20	55	6	1
VTR25	59.9185 - 6.063333	59.9144 -6.06785	544	871	20	60	6	1
VTR26	**59.927983 - 6.093333**	**59.924516 - 6.098733**	**516**	**826**	**20**	**54**	**48**	**1**
VTR27b[a]	59.945166 - 6.144316	59.9480666 - 6.136616	1035	1657	40	53	5	1
VTR28[R*]	**59.87065 - 6.106783**	**59.86695 -6.11515**	**663**	**1061**	**20**	**63**	**55**	**2**
VTR29[R*]	**59.87075 - 5.951483**	**59.867133 - 5.957283**	**537**	**859**	**20**	**63**	**57**	**1**
		Totals	**17627**	**28204**		**1690**	**729**	**33**

3.1.2 Summary of EUNIS Habitats present

Habitats (EUNIS level 3) or biotope complexes (EUNIS level 4) were assigned to stills and video clips using information from EUNIS guidance (Davies et al, 2004). Two EUNIS level 3 habitats were identified within the WTR tows: Deep-sea mixed substrata, which dominated the video transects, and Deep-sea rock and artificial hard substrata, which was present in only three video tows (Table 4). One EUNIS level 4 biotope, Boulders on the deep-sea bed, was recognised in three video tows, whilst Deep-sea bedrock was also identified from 11 stills. The video of areas of Deep-sea bedrock covered an area over 100m in tow length on transect WTR VTR 28, but was not of high enough quality to distinguish it from areas of boulders in video so it was probably overall a mosaiced area. The single image of Deep-sea bedrock on transect WTR VTR29 was probably too small to be considered a full EUNIS biotope but has been noted by the surveyor.

Table 4. EUNIS Habitats assigned to WTR imagery and the number of tows, video and stills samples each was assigned to

EUNIS Habitat (code)	EUNIS level	No of video samples present in	No of stills present in
Deep-sea mixed substrata (A6.2)	3	30	614
Deep-sea rock and artificial hard substrata (A6.1)	3	3	112
Boulders on the deep-sea bed (A6.14)	4	3	101
Deep-sea bedrock (A6.11)	4	0	11

A map of the locations of these EUNIS habitats is provided in Figure 3.

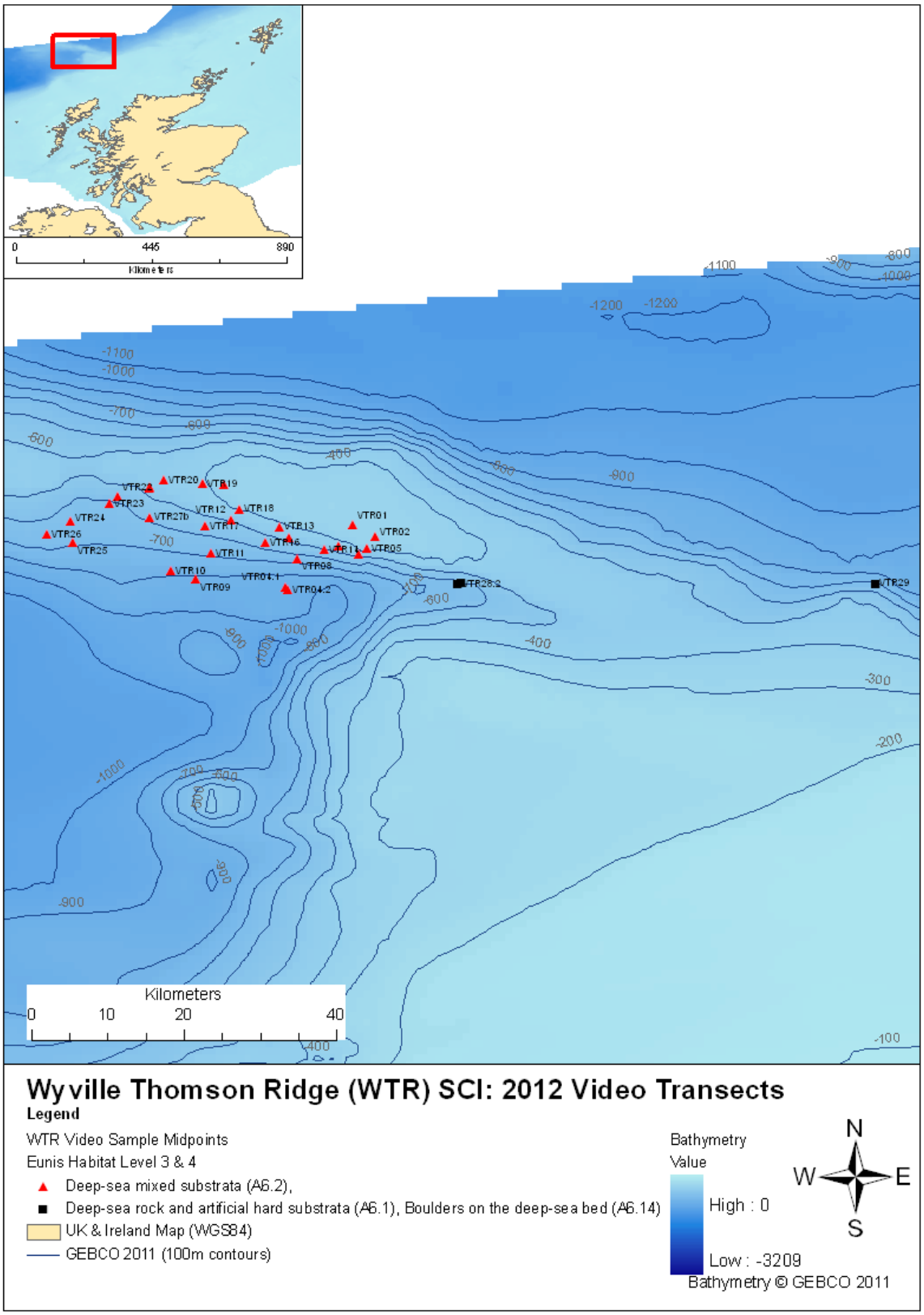


Figure 3. Locations of EUNIS habitats within the 2012 Wyville Thomson Ridge SCI survey area off Scotland (WTR Scottish Location Box) using video sample centre points (WTR Video Points). Photo samples (WTR Stills Points), taken at approximately 20 or 60 second intervals, were analysed from all stations however are not visible at the current map scale.

3.1.3 Description of habitat types present

Three broad habitat types were observed in the Wyville Thomson Ridge SCI seabed imagery survey: Annex 1 Reef (and potential), low quality reef (not of high enough quality to be deemed Annex 1 “reef”) and bathyal mixed substrates. Examples of these, together with the number of samples of each, are presented in Table 5. Where more than six video tows were dominated by a broad habitat type, six full seabed imagery tows were analysed. Several video tows also included mosaics of more than one broad habitat type.

More detailed habitat names, describing the substrate and dominant taxa, were also assigned to each sample for the purposes of Marine Recorder data entry. In total, 22 individual habitat names were assigned (Table 6).

Areas with two or more biotopes mixed together, interspersed or regularly repeating, such as waves of coarse and then fine sediments, were defined as being a mosaic of all contributing habitats/biotopes.

Refer to Appendix 3 for representative images for each tow together with further detail on characterising and dominant species found within each WTR habitat.

Table 5. Broad habitat types observed in 2012 Wyville Thomson Ridge seabed imagery and the number of tows, video and stills samples each was assigned to. Where stills were available at 20 second intervals 6 whole tows were analysed for each broad habitat type.

Habitat Type	Typical image	No of still samples	No of video habitats (samples)	No of tows analysed @ 20 sec intervals
Annex 1 Reef (potential & definite)		112	3	2
Low Quality Reef		262	4	6
Bathyal Mixed Substrates		352	17	6
Bathyal Mosaics	n/a	0	9	2

Table 6. A breakdown of detailed habitat names assigned seabed imagery tow on the Wyville Thomson Ridge SCI, 2012.

Broad Habitat type	Detailed Habitat Name	No of samples where this habitat dominated:	
Annex 1 Reef	Bathyal Annex 1 stony reef with Lophelia +/- Madrepora & Porifera crusts	No of stills	18
		No of video habitats	1
Annex 1 Reef	Bathyal Annex 1 stony reef with Porifera, Cnidaria & Echinoderms	No of stills	57
		No of video habitats	1
Potential Annex 1 Reef	Bathyal Potential Annex 1 stony reef with Lophelia +/- Madrepora	No of stills	4
		No of video habitats	0
Potential Annex 1 Reef	Bathyal Potential Annex 1 stony reef with Lophelia +/- Madrepora & Porifera	No of stills	24
		No of video habitats	1
Potential Annex 1 Reef	Bathyal Potential Annex 1 stony reef with Porifera	No of stills	8
		No of video habitats	0
Potential Annex 1 Reef	Bathyal Potential Annex 1 stony reef with Porifera, Cnidaria & Echinoderms	No of stills	1
		No of video habitats	0
Low Quality Reef	Bathyal Low Quality stony reef with no evidence of epifauna	No of stills	4
		No of video habitats	0
Low Quality Reef	Bathyal Low Quality stony reef with Porifera	No of stills	48
		No of video habitats	0
Low Quality Reef	Bathyal Low Quality stony reef with Porifera & Cnidaria	No of stills	3
		No of video habitats	0
Low Quality Reef	Bathyal Low Quality stony reef with Serpulids	No of stills	1
		No of video habitats	0
Low Quality Reef	Bathyal Low Quality stony reef with Serpulids & Cnidarians	No of stills	1
		No of video habitats	0
Low Quality Reef	Bathyal Low Quality stony reef with Serpulids & encrusting sponge	No of stills	19
		No of video habitats	
Low Quality Reef	Bathyal Low Quality stony reef with very sparse epifauna	No of stills	186
		No of video habitats	4
Bathyal Mixed Substrates	Bathyal mixed sediment with sparse epifauna	No of stills	4
		No of video habitats	0
Bathyal Mixed Substrates	Bathyal mixed sediment, no visible epifauna	No of stills	0
		No of video habitats	1
Bathyal Mixed Substrates	Bathyal mixed sediment, sparse epifauna	No of stills	6
		No of video habitats	1
Bathyal Mixed Substrates	Bathyal mixed sediment, very sparse epifauna	No of stills	77
		No of video habitats	4
Bathyal Mixed Substrates	Bathyal mixed substrates dominated by coarse sediments with no evidence of epifauna	No of stills	50
		No of video habitats	0
Bathyal Mixed Substrates	Bathyal mixed substrates dominated by coarse sediments with Porifera	No of stills	55
		No of video habitats	1
Bathyal Mixed Substrates	Bathyal mixed substrates dominated by coarse sediments with very sparse epifauna	No of stills	153
		No of video habitats	9
Bathyal Mixed Substrates	Bathyal-sea mixed substrates	No of stills	1
		No of video habitats	0
Bathyal Mixed Substrates	Bioturbated bathyal mixed sediment, very sparse epifauna	No of stills	6
		No of video habitats	1
Bathyal Mosaics	Mosaic of Bathyal coarse mixed substrates and cobble reef	No of stills	0
		No of video habitats	1
Bathyal Mosaics	Mosaic of Bathyal mixed substrates and low quality stony reef	No of stills	0
		No of video habitats	8
	Total Count of Stills (including 3 not good enough quality to assign habitat)		726
	Total No of video habitats		33

Low quality stony reef was assigned to a large proportion of samples (262 stills and four video samples). This was clast supported poorly sorted reef that comprised greater than 10% cobbles or boulders, was not greatly elevated from the seafloor, and with a mix of infauna and epifaunal life, as described by Irving 2009. Table 7 gives examples of low quality stony reef not classified as Annex 1 reef.

Table 7. Examples of low quality stony reef not deemed to be of high enough quality to be considered an Annex 1 Reef feature of the SCI.

WTR_VTR4

WTR_VTR6

WTR_VTR15

WTR_VTR18

3.1.4 Annex 1 Features present

Definite Annex 1 rocky reef was observed on bedrock and boulders at WTR_VTR28 & 29, example images of which are provided in Table 8 below. In total 71 stills images contained definite Annex 1 reef (Table 9), all at WTR_VTR 28 and 29.

Table 8. Typical images of Annex 1 Reef (rocky reef) features observed on the Wyville Thomson Ridge during 2012 surveys.

Annex 1 Reef at WTR_VTR29

Annex 1 Reef at WTR_VTR29

Potential Annex 1 Reef at WTR_VTR28

Potential Annex 1 Reef at WTR_VTR28

Potential Annex 1 reef was also identified in a further 35 images, two from WTR_VTR14 and the rest from WTR_VTR28. Potential Annex 1 reef was not identified from video at WTR_VTR 14, which could be due to the quality of the video or an insuffient size of area to be classified as Annex 1 rocky reef.

Potential Annex 1 reef was also identified during video tows at WTR_VTR25. As no photographic stills from WTR_VTR25 were thought to contain Annex 1 reef, it is possible that the video tow was not of high enough quality to accurately assess the habitat to Annex 1 quality.

Table 9. Annex 1 habitats assigned to WTR imagery and the number of tows, video and stills samples each was assigned to.

Video Tow (WTR event)	Sample Ref	Annex 1 Reef	Method	Position start / point	Position End	Depth (m bsl)
VTR14	WTR_VTR14 IMG_0798	Potential	Photographic stills	59.90809 - 6.603025		533
VTR14	WTR_VTR14 IMG_0819	Potential	Photographic stills	59.906915 - 6.605376		564
VTR25	20121102_WTR_VTR25 VHab1	Potential	Towed Video	59.9185 - 6.063333	59.9144 - 6.06785	775
VTR28	20121102 WTR_VTR28 V Hab 1	Potential	Towed Video	59.87065 - 6.106783	59.86945 -6.110333	655
VTR28	20121102 WTR_VTR28 V Hab 2	Definite	Towed Video	59.869433 - 6.11035	59.86695 -6.11515	723
VTR28	WTR_VTR28 IMG_1468	Potential	Photographic stills	59.870402 - 6.440418		674
VTR28	WTR_VTR28 IMG_1469	Potential	Photographic stills	59.870318 - 6.440498		684
VTR28	WTR_VTR28 IMG_1470	Potential	Photographic stills	59.870257 - 6.440571		694
VTR28	WTR_VTR28 IMG_1472	Potential	Photographic stills	59.870106 - 6.440967		704
VTR28	WTR_VTR28 IMG_1473	Potential	Photographic stills	59.870077 - 6.441166		701
VTR28	WTR_VTR28 IMG_1474	Potential	Photographic stills	59.870040 - 6.441452		705
VTR28	WTR_VTR28 IMG_1475	Potential	Photographic stills	59.870008 - 6.441828		711
VTR28	WTR_VTR28 IMG_1476	Potential	Photographic stills	59.869986 - 6.442043		709
VTR28	WTR_VTR28 IMG_1477	Potential	Photographic stills	59.869984 - 6.442210		715
VTR28	WTR_VTR28 IMG_1478	Potential	Photographic stills	59.869953 - 6.442396		717
VTR28	WTR_VTR28 IMG_1479	Potential	Photographic stills	59.869914 - 6.442561		717
VTR28	WTR_VTR28 IMG_1482	Potential	Photographic stills	59.869788 - 6.442945		721
VTR28	WTR_VTR28 IMG_1486	Potential	Photographic stills	59.869511 - 6.443557		723
VTR28	WTR_VTR28 IMG_1487	Definite	Photographic stills	59.869464 - 6.443657		723
VTR28	WTR_VTR28 IMG_1488	Definite	Photographic stills	59.869292 - 6.443927		723
VTR28	WTR_VTR28 IMG_1489	Definite	Photographic stills	59.869237 - 6.4440665		724
VTR28	WTR_VTR28 IMG_1490	Definite	Photographic stills	59.869162 - 6.444247		723
VTR28	WTR_VTR28 IMG_1491	Definite	Photographic stills	59.869119 - 6.444357		724
VTR28	WTR_VTR28 IMG_1492	Definite	Photographic stills	59.869047 - 6.444496		724
VTR28	WTR_VTR28 IMG_1493	Definite	Photographic stills	59.869005 - 6.444656		723
VTR28	WTR_VTR28 IMG_1494	Definite	Photographic stills	59.868925 - 6.444794		723
VTR28	WTR_VTR28 IMG_1495	Definite	Photographic stills	59.868923 - 6.444833		723
VTR28	WTR_VTR28 IMG_1496	Definite	Photographic stills	59.86889 - 6.444892		723
VTR28	WTR_VTR28 IMG_1497	Definite	Photographic stills	59.86886 - 6.444972		723
VTR28	WTR_VTR28 IMG_1498	Definite	Photographic stills	59.868798 - 6.445106		723

Video Tow (WTR event)	Sample Ref	Annex 1 Reef	Method	Position start / point	Position End	Depth (m bsl)
VTR28	WTR_VTR28 IMG_1499	Definite	Photographic stills	59.868722 - 6.445183		723
VTR28	WTR_VTR28 IMG_1500	Potential	Photographic stills	59.868675 - 6.445304		723
VTR28	WTR_VTR28 IMG_1501	Potential	Photographic stills	59.868610 - 6.445387		723
VTR28	WTR_VTR28 IMG_1502	Potential	Photographic stills	59.868498 - 6.445534		722
VTR28	WTR_VTR28 IMG_1503	Potential	Photographic stills	59.868395 - 6.445705		723
VTR28	WTR_VTR28 IMG_1504	Potential	Photographic stills	59.868322 - 6.445805		722
VTR28	WTR_VTR28 IMG_1506	Potential	Photographic stills	59.868131 - 6.4460578		720
VTR28	WTR_VTR28 IMG_1507	Definite	Photographic stills	59.868102 - 6.44608		721
VTR28	WTR_VTR28 IMG_1508	Potential	Photographic stills	59.868023 - 6.446153		720
VTR28	WTR_VTR28 IMG_1509	Potential	Photographic stills	59.867967 - 6.446206		720
VTR28	WTR_VTR28 IMG_1510	Potential	Photographic stills	59.867879 - 6.446293		715
VTR28	WTR_VTR28 IMG_1512	Potential	Photographic stills	59.867712 - 6.446501		718
VTR28	WTR_VTR28 IMG_1513	Potential	Photographic stills	59.867614 - 6.446575		719
VTR28	WTR_VTR28 IMG_1514	Potential	Photographic stills	59.867562 - 6.446700		719
VTR28	WTR_VTR28 IMG_1515	Potential	Photographic stills	59.867471 - 6.4468006		719
VTR28	WTR_VTR28 IMG_1516	Potential	Photographic stills	59.867429 - 6.446851		718
VTR28	WTR_VTR28 IMG_1517	Potential	Photographic stills	59.867362 - 6.447009		717
VTR28	WTR_VTR28 IMG_1518	Potential	Photographic stills	59.867274 - 6.447117		717
VTR28	WTR_VTR28 IMG_1519	Potential	Photographic stills	59.867210 - 6.447364		717
VTR28	WTR_VTR28 IMG_1520	Potential	Photographic stills	59.867116 - 6.447556		716
VTR28	WTR_VTR28 IMG_1521	Potential	Photographic stills	59.867103 - 6.447756		716
VTR28	WTR_VTR28 IMG_1522	Potential	Photographic stills	59.867053 - 6.447925		715
VTR29	20121102WTR_VTR29 V Hab 1	Definite	Towed Video	59.87075 - 5.951483	59.867133 -5.957283	701
VTR29	WTR VTR29 IMG_1526	Definite	Photographic stills	59.87076 - 5.95148		701
VTR29	WTR VTR29 IMG_1527	Definite	Photographic stills	59.87065 - 5.95161		700
VTR29	WTR VTR29 IMG_1528	Definite	Photographic stills	59.87062 - 5.95166		700
VTR29	WTR VTR29 IMG_1529	Definite	Photographic stills	59.87054 - 5.95177		700
VTR29	WTR VTR29 IMG_1530	Definite	Photographic stills	59.87046 - 5.95186		700
VTR29	WTR VTR29 IMG_1531	Definite	Photographic stills	59.87039 - 5.95194		700
VTR29	WTR VTR29 IMG_1532	Definite	Photographic stills	59.87032 - 5.95204		695
VTR29	WTR VTR29 IMG_1533	Definite	Photographic stills	59.87027 - 5.95209		695
VTR29	WTR VTR29 IMG_1534	Definite	Photographic stills	59.87021 -		693

Video Tow (WTR event)	Sample Ref	Annex 1 Reef	Method	Position start / point	Position End	Depth (m bsl)
				5.95217		
VTR29	WTR VTR29 IMG_1535	Definite	Photographic stills	59.8701 - 5.95234		691
VTR29	WTR VTR29 IMG_1536	Definite	Photographic stills	59.87005 - 5.95242		691
VTR29	WTR VTR29 IMG_1537	Definite	Photographic stills	59.86997 - 5.95249		691
VTR29	WTR VTR29 IMG_1538	Definite	Photographic stills	59.86992 - 5.95251		690
VTR29	WTR VTR29 IMG_1539	Definite	Photographic stills	59.86987 - 5.95256		689
VTR29	WTR VTR29 IMG_1540	Definite	Photographic stills	59.86983 - 5.95257		685
VTR29	WTR VTR29 IMG_1541	Definite	Photographic stills	59.86973 - 5.95264		683
VTR29	WTR VTR29 IMG_1542	Definite	Photographic stills	59.86967 - 5.95272		683
VTR29	WTR VTR29 IMG_1543	Definite	Photographic stills	59.86963 - 5.95276		682
VTR29	WTR VTR29 IMG_1544	Definite	Photographic stills	59.86954 - 5.95278		681
VTR29	WTR VTR29 IMG_1545	Definite	Photographic stills	59.86947 - 5.95286		681
VTR29	WTR VTR29 IMG_1546	Definite	Photographic stills	59.86942 - 5.95292		681
VTR29	WTR VTR29 IMG_1547	Definite	Photographic stills	59.86937 - 5.95303		679
VTR29	WTR VTR29 IMG_1548	Definite	Photographic stills	59.86932 - 5.95313		679
VTR29	WTR VTR29 IMG_1549	Definite	Photographic stills	59.86921 - 5.9533		677
VTR29	WTR VTR29 IMG_1550	Definite	Photographic stills	59.86917 - 5.95334		679
VTR29	WTR VTR29 IMG_1551	Definite	Photographic stills	59.86914 - 5.95343		678
VTR29	WTR VTR29 IMG_1552	Definite	Photographic stills	59.86905 - 5.95352		676
VTR29	WTR VTR29 IMG_1553	Definite	Photographic stills	59.86898 - 5.9536		674
VTR29	WTR VTR29 IMG_1554	Definite	Photographic stills	59.86891 - 5.95368		675
VTR29	WTR VTR29 IMG_1555	Definite	Photographic stills	59.86887 - 5.95377		675
VTR29	WTR VTR29 IMG_1556	Definite	Photographic stills	59.86879 - 5.95392		668
VTR29	WTR VTR29 IMG_1557	Definite	Photographic stills	59.86875 - 5.95398		666
VTR29	WTR VTR29 IMG_1558	Definite	Photographic stills	59.8687 - 5.95406		671
VTR29	WTR VTR29 IMG_1559	Definite	Photographic stills	59.86862 - 5.9542		666
VTR29	WTR VTR29 IMG_1560	Definite	Photographic stills	59.86856 - 5.95433		663
VTR29	WTR VTR29 IMG_1561	Definite	Photographic stills	59.86851 - 5.95446		661
VTR29	WTR VTR29 IMG_1562	Definite	Photographic stills	59.86845 - 5.95459		661
VTR29	WTR VTR29 IMG_1563	Definite	Photographic stills	59.8684 - 5.95474		660
VTR29	WTR VTR29 IMG_1564	Definite	Photographic stills	59.86836 - 5.95486		660
VTR29	WTR VTR29 IMG_1565	Definite	Photographic stills	59.8683 - 5.95507		659

Video Tow (WTR event)	Sample Ref	Annex 1 Reef	Method	Position start / point	Position End	Depth (m bsl)
VTR29	WTR VTR29 IMG_1566	Definite	Photographic stills	59.86811 - 5.95554		657
VTR29	WTR VTR29 IMG_1567	Definite	Photographic stills	59.86803 - 5.95569		651
VTR29	WTR VTR29 IMG_1568	Definite	Photographic stills	59.86798 - 5.95578		649
VTR29	WTR VTR29 IMG_1569	Definite	Photographic stills	59.86793 - 5.95593		649
VTR29	WTR VTR29 IMG_1570	Definite	Photographic stills	59.86786 - 5.95611		644
VTR29	WTR VTR29 IMG_1571	Definite	Photographic stills	59.86779 - 5.95622		643
VTR29	WTR VTR29 IMG_1572	Definite	Photographic stills	59.86774 - 5.95628		646
VTR29	WTR VTR29 IMG_1573	Definite	Photographic stills	59.8677 - 5.95632		646
VTR29	WTR VTR29 IMG_1574	Definite	Photographic stills	59.86762 - 5.95643		645
VTR29	WTR VTR29 IMG_1575	Definite	Photographic stills	59.86759 - 5.95648		640
VTR29	WTR VTR29 IMG_1576	Definite	Photographic stills	59.86755 - 5.95656		641
VTR29	WTR VTR29 IMG_1577	Definite	Photographic stills	59.86753 - 5.9566		640
VTR29	WTR VTR29 IMG_1578	Definite	Photographic stills	59.86744 - 5.95671		639
VTR29	WTR VTR29 IMG_1579	Definite	Photographic stills	59.8674 - 5.95682		639
VTR29	WTR VTR29 IMG_1580	Definite	Photographic stills	59.86734 - 5.95692		637
VTR29	WTR VTR29 IMG_1581	Definite	Photographic stills	59.86729 - 5.95707		637
VTR29	WTR VTR29 IMG_1582	Definite	Photographic stills	59.86718 - 5.95718		635

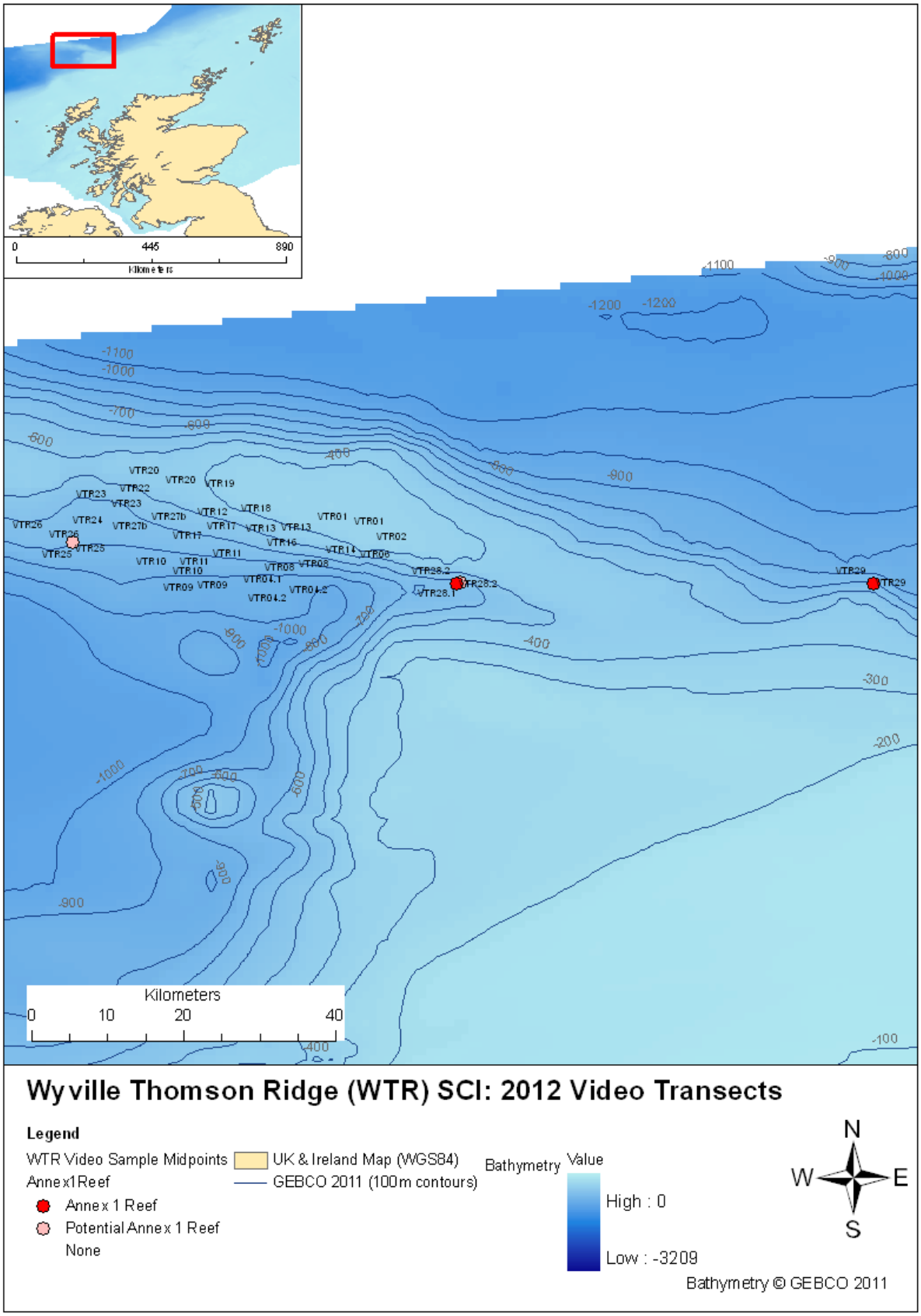


Figure 4. Locations of Annex 1 habitats observed within the 2012 Wyville Thomson Ridge SCI survey area off Scotland (WTR Scottish Location Box) displaying individual video sample centre points (WTR Video Points). Photo samples (WTR Stills Points), taken at approximately 20 or 60 second intervals, were analysed from all stations however are not visible at the current map scale

3.1.5 Scottish Marine Protected Area Search Features present

Two Scottish MPA search features were identified in the WTR 2012 seabed imagery (Table 10): Blue Ling (*Molva dypterygia*) was present in 6 video habitats and 8 stills images, and potential octocoral dominated 'Coral gardens (offshore waters)' were present in one video habitat and 57 stills images all at WTR_VTR29.

Figure 5 shows locations of these features on video tows alone (not including stills which are too small and many for maps).

Table 10. Scottish MPA search features assigned to WTR imagery and the position of each. Where the feature is missing in the first column, the sample contains the last listed Scottish MPA aearch feature.

Scottish MPA Search Feature Present	Video Tow (event)	Sample Ref	Method	Position start / point	Position End	Depth (m bsl)
Blue Ling (Molva dypterygia) - potential	WTR_VTR1	20121028_WTR_VTR1_Hab1	Towed Video	59.9387 - 6.0631	59.93383 - 6.077833	336
	WTR_VTR1	WTR_VTR1 IMG_0206	Photographic still	59.933747 -6.577939		337
	WTR_VTR13	20121101_WTR_VTR13_Hab1	Towed Video	59.935983 -6.150816	59.932533 -6.160166	355
Blue Ling (Molva dypterygia) - definite	WTR_VTR16	WTR VTR16_0932	Photographic still	59.91632 - 6.67407		575
	WTR_VTR18	WTR VTR18__1047	Photographic still	59.95719 - 6.70455		360
	WTR_VTR19	20121102_WTR_VTR19_VHab1	Towed Video	59.98386 - 6.077983	59.988416 -6.080666	373
	WTR_VTR19	WTR VTR19 IMG__1068	Photographic still	59.98416 - 6.7449		373
	WTR_VTR19	WTR VTR19 IMG__1085	Photographic still	59.98557 - 6.7461		377
	WTR_VTR20	20121102_WTR_VTR20_VHab1	Towed Video	59.98805 - 6.127	59.9927 - 6.127	433
	WTR_VTR20	WTR VTR20 IMG_1139	Photographic still	59.99066 - 6.79252		430
	WTR_VTR23	20121102_WTR_VTR23 VHab1	Towed Video	59.9645 - 6.01935	59.960566 -6.0249166	605
	WTR_VTR28	20121102 WTR_VTR28 V Hab 1	Towed Video	59.87065 - 6.106783	59.86945 - 6.110333	655
	WTR_VTR28	WTR_VTR28 IMG_1468	Photographic still	59.870402 -6.440418		674
	WTR_VTR8	WTR VTR8__0558	Photographic still	59.89644 - 6.63383		680
Potential Coral Gardens (offshore waters)	WTR_VTR29	20121102WTR_VTR29 V Hab 1	Towed Video	59.87075 - 5.95148	59.8671333 -5.957283	701
	WTR_VTR29	WTR VTR29 IMG_1526	Photographic still	59.87076 - 5.95148		701
	WTR_VTR29	WTR VTR29 IMG_1527	Photographic still	59.87065 - 5.95161		700
	WTR_VTR29	WTR VTR29 IMG_1528	Photographic still	59.87062 - 5.95166		700
	WTR_VTR29	WTR VTR29 IMG_1529	Photographic still	59.87054 - 5.95177		700
	WTR_VTR29	WTR VTR29 IMG_1530	Photographic still	59.87046 - 5.95186		700

Scottish MPA Search Feature Present	Video Tow (event)	Sample Ref	Method	Position start / point	Position End	Depth (m bsl)
Potential Coral Gardens (offshore waters)	WTR_VTR29	WTR VTR29 IMG_1531	Photographic still	59.87039 - 5.95194		700
	WTR_VTR29	WTR VTR29 IMG_1532	Photographic still	59.87032 - 5.95204		695
	WTR_VTR29	WTR VTR29 IMG_1533	Photographic still	59.87027 - 5.95209		695
	WTR_VTR29	WTR VTR29 IMG_1534	Photographic still	59.87021 - 5.95217		693
	WTR_VTR29	WTR VTR29 IMG_1535	Photographic still	59.8701 - 5.95234		691
	WTR_VTR29	WTR VTR29 IMG_1536	Photographic still	59.87005 - 5.95242		691
	WTR_VTR29	WTR VTR29 IMG_1537	Photographic still	59.86997 - 5.95249		691
	WTR_VTR29	WTR VTR29 IMG_1538	Photographic still	59.86992 - 5.95251		690
	WTR_VTR29	WTR VTR29 IMG_1539	Photographic still	59.86987 - 5.95256		689
	WTR_VTR29	WTR VTR29 IMG_1540	Photographic still	59.86983 - 5.95257		685
	WTR_VTR29	WTR VTR29 IMG_1541	Photographic still	59.86973 - 5.95264		683
	WTR_VTR29	WTR VTR29 IMG_1542	Photographic still	59.86967 - 5.95272		683
	WTR_VTR29	WTR VTR29 IMG_1543	Photographic still	59.86963 - 5.95276		682
	WTR_VTR29	WTR VTR29 IMG_1544	Photographic still	59.86954 - 5.95278		681
	WTR_VTR29	WTR VTR29 IMG_1545	Photographic still	59.86947 - 5.95286		681
	WTR_VTR29	WTR VTR29 IMG_1546	Photographic still	59.86942 - 5.95292		681
	WTR_VTR29	WTR VTR29 IMG_1547	Photographic still	59.86937 - 5.95303		679
	WTR_VTR29	WTR VTR29 IMG_1548	Photographic still	59.86932 - 5.95313		679
	WTR_VTR29	WTR VTR29 IMG_1549	Photographic still	59.86921 - 5.9533		677
	WTR_VTR29	WTR VTR29 IMG_1550	Photographic still	59.86917 - 5.95334		679
	WTR_VTR29	WTR VTR29 IMG_1551	Photographic still	59.86914 - 5.95343		678
	WTR_VTR29	WTR VTR29 IMG_1552	Photographic still	59.86905 - 5.95352		676
	WTR_VTR29	WTR VTR29 IMG_1553	Photographic still	59.86898 - 5.9536		674
	WTR_VTR29	WTR VTR29 IMG_1554	Photographic still	59.86891 - 5.95368		675
	WTR_VTR29	WTR VTR29 IMG_1555	Photographic still	59.86887 - 5.95377		675
	WTR_VTR29	WTR VTR29 IMG_1556	Photographic still	59.86879 - 5.95392		668
	WTR_VTR29	WTR VTR29 IMG_1557	Photographic still	59.86875 - 5.95398		666
	WTR_VTR29	WTR VTR29 IMG_1558	Photographic still	59.8687 - 5.95406		671
	WTR_VTR29	WTR VTR29 IMG_1559	Photographic still	59.86862 - 5.9542		666
	WTR_VTR29	WTR VTR29 IMG_1560	Photographic still	59.86856 - 5.95433		663

Scottish MPA Search Feature Present	Video Tow (event)	Sample Ref	Method	Position start / point	Position End	Depth (m bsl)
	WTR_VTR29	WTR VTR29 IMG_1561	Photographic still	59.86851 - 5.95446		661
Potential Coral Gardens (offshore waters)	WTR_VTR29	WTR VTR29 IMG_1562	Photographic still	59.86845 - 5.95459		661
	WTR_VTR29	WTR VTR29 IMG_1563	Photographic still	59.8684 - 5.95474		660
	WTR_VTR29	WTR VTR29 IMG_1564	Photographic still	59.86836 - 5.95486		660
	WTR_VTR29	WTR VTR29 IMG_1565	Photographic still	59.8683 - 5.95507		659
	WTR_VTR29	WTR VTR29 IMG_1566	Photographic still	59.86811 - 5.95554		657
	WTR_VTR29	WTR VTR29 IMG_1567	Photographic still	59.86803 - 5.95569		651
	WTR_VTR29	WTR VTR29 IMG_1568	Photographic still	59.86798 - 5.95578		649
	WTR_VTR29	WTR VTR29 IMG_1569	Photographic still	59.86793 - 5.95593		649
	WTR_VTR29	WTR VTR29 IMG_1570	Photographic still	59.86786 - 5.95611		644
	WTR_VTR29	WTR VTR29 IMG_1571	Photographic still	59.86779 - 5.95622		643
	WTR_VTR29	WTR VTR29 IMG_1572	Photographic still	59.86774 - 5.95628		646
	WTR_VTR29	WTR VTR29 IMG_1573	Photographic still	59.8677 - 5.95632		646
	WTR_VTR29	WTR VTR29 IMG_1574	Photographic still	59.86762 - 5.95643		645
	WTR_VTR29	WTR VTR29 IMG_1575	Photographic still	59.86759 - 5.95648		640
	WTR_VTR29	WTR VTR29 IMG_1576	Photographic still	59.86755 - 5.95656		641
	WTR_VTR29	WTR VTR29 IMG_1577	Photographic still	59.86753 - 5.9566		640
	WTR_VTR29	WTR VTR29 IMG_1578	Photographic still	59.86744 - 5.95671		639
	WTR_VTR29	WTR VTR29 IMG_1579	Photographic still	59.8674 - 5.95682		639
	WTR_VTR29	WTR VTR29 IMG_1580	Photographic still	59.86734 - 5.95692		637
	WTR_VTR29	WTR VTR29 IMG_1581	Photographic still	59.86729 - 5.95707		637
	WTR_VTR29	WTR VTR29 IMG_1582	Photographic still	59.86718 - 5.95718		635

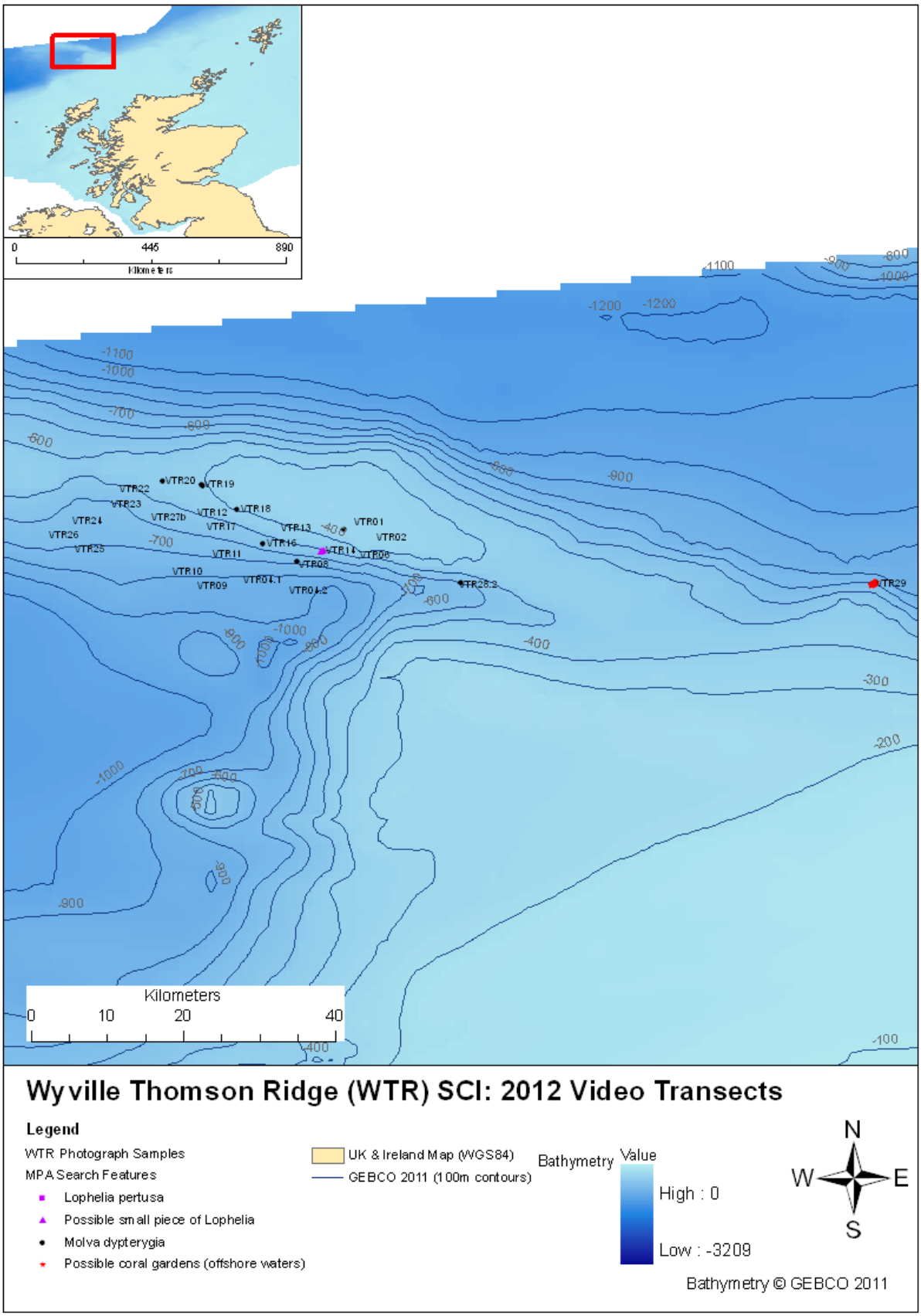


Figure 5. Locations of Scottish Marine Protected Area Search Features observed within the 2012 Wyville Thomson Ridge SCI survey area off Scotland (WTR Scottish Location Box) displaying individual video sample centre points (WTR Video Points). Photo samples (WTR Stills Points), taken at approximately 20 or 60 second intervals, were analysed from all stations however are not visible at the current map scale

3.1.6 Other Species of Conservation Interest Identified

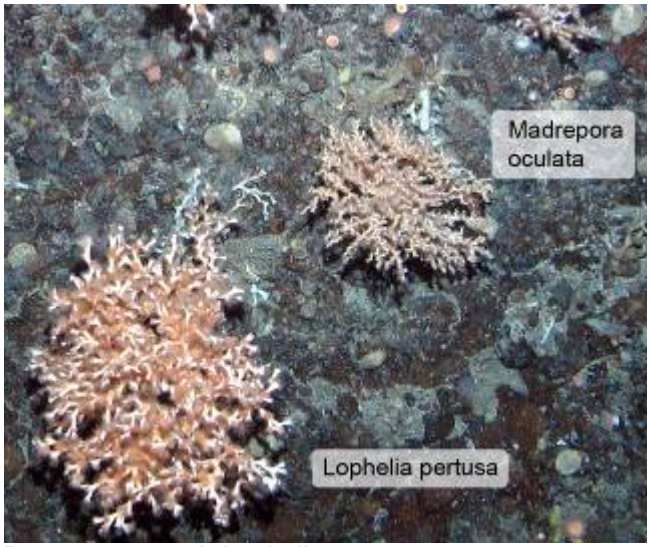
Other species of conservation interest included any species mentioned in the following lists: Scottish UK Species Conservation Importance and Priority Marine Features (Moore & Roberts, 2011), Scottish Biodiversity List, UK Biodiversity Action Plan priority species or habitats, UK Species of Conservation Importance, Nationally rare or scarce marine species (UK), IUCN Red List vulnerable species (URL[5]: The IUCN Red List) and any species protected by the OSPAR Convention (OSPAR Commission, 2008).

The following species of conservation interest were identified in the WTR 2012 seabed imagery:

- **Deep water coral** (*Lophelia pertusa*), UK species of conservation importance present in 4 video tows and 46 stills images (Table 11). Also when habitat or reef forming *Lophelia* forms a UK BAP habitat, OSPAR habitat, and Habitats Directive Annex I (reef)),
- **Octocorallia** (soft corals), Scottish Biodiversity list, present in two video tows and 65 stills images (Table 11)
- **Gorgonacea** (Gorgonian soft corals), IUCN Red List, present in at least one photographic still (Table 11)
- **Blue Ling** *(Molva dypterygia),* UK Biodiversity Action Plan priority species, present in 6 video habitats and 8 stills images (Pictured in Table 11, detailed in Table 10 Scottish MPA Search Feature above).

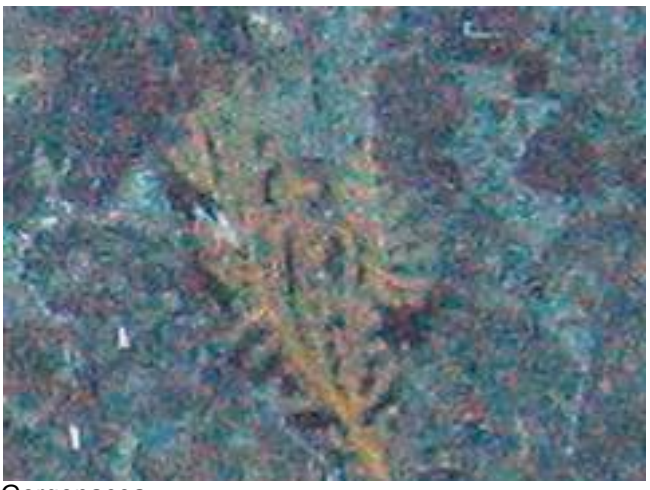
Positions and depth of each Species of Conservation Interest are detailed in Table 12 below, and presented on a map in Figure 6.

Table 11. Examples of species of conservation interest identified in 2012 WTR seabed imagery.

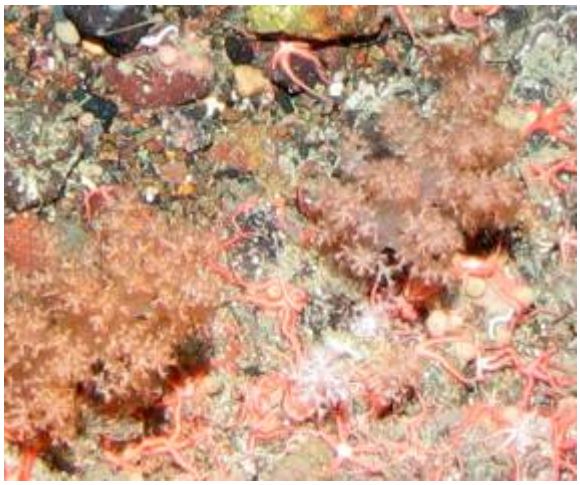


Deep water coral, *Lophelia pertusa*
UK Species of Conservation Importance

Blue Ling (*Molva dypterygia*)
UK Biodiversity Action Plan priority species
& Scottish MPA Search Feature



Gorgonacea
IUCN Red List



Octocorallia
Scottish Biodiversity List

Table 12. Species of conservation importance identified in the 2012 WTR seabed imagery and the positions of each.

Species	Conservation Interest	Video Tow (event)	Sample Ref	Method	Position start / point	Position End	Depth (m bsl)
Deep water coral (*Lophelia pertusa*)	UK Sp Conservation Importance	WTR_VTR14	WTR_VTR14 IMG_0798	Photographic still	59.909098 - 6.603025		533
		WTR_VTR26	WTR_VTR26_ IMG1368	Photographic still	59.92732 -6.92789		750
		WTR_VTR26	WTR_VTR26_ IMG1389	Photographic still	59.92588 -6.93058		756
		WTR_VTR26	WTR_VTR26_ IMG1405	Photographic still	59.92495 -6.932		758
		WTR_VTR28	20121102 WTR_VTR28 V Hab 1	Towed Video	59.87065 -6.106783	59.86945 -6.110333	655
		WTR_VTR28	WTR_VTR28 IMG_1468	Photographic still	59.870402 - 6.440418		674
		WTR_VTR28	WTR_VTR28 IMG_1469	Photographic still	59.870318 - 6.440498		684
		WTR_VTR28	WTR_VTR28 IMG_1470	Photographic still	59.870257 - 6.440571		694
		WTR_VTR28	WTR_VTR28 IMG_1472	Photographic still	59.870106 - 6.440967		704
		WTR_VTR28	WTR_VTR28 IMG_1482	Photographic still	59.869788 - 6.442945		721
		WTR_VTR28	WTR_VTR28 IMG_1486	Photographic still	59.869511 - 6.443557		723
		WTR_VTR28	WTR_VTR28 IMG_1487	Photographic still	59.869464 - 6.443657		723
		WTR_VTR28	WTR_VTR28 IMG_1488	Photographic still	59.869292 - 6.443927		723
		WTR_VTR28	WTR_VTR28 IMG_1489	Photographic still	59.869237 - 6.444066		724
		WTR_VTR28	WTR_VTR28 IMG_1490	Photographic still	59.869162 - 6.444247		723
		WTR_VTR28	WTR_VTR28 IMG_1491	Photographic still	59.869119 - 6.444357		724
		WTR_VTR28	WTR_VTR28 IMG_1492	Photographic still	59.869047 - 6.444496		724
		WTR_VTR28	WTR_VTR28 IMG_1494	Photographic still	59.868925 - 6.444794		723
		WTR_VTR28	WTR_VTR28 IMG_1495	Photographic still	59.868923 - 6.444833		723
		WTR_VTR28	WTR_VTR28 IMG_1496	Photographic still	59.868894 - 6.444892		723
		WTR_VTR28	WTR_VTR28 IMG_1497	Photographic still	59.868868 - 6.444972		723

Species	Conservation Interest	Video Tow (event)	Sample Ref	Method	Position start / point	Position End	Depth (m bsl)
Deep water coral (*Lophelia pertusa*)	UK Sp Conservation Importance	WTR_VTR28	WTR_VTR28 IMG_1498	Photographic still	59.868798 - 6.445106		723
		WTR_VTR28	WTR_VTR28 IMG_1499	Photographic still	59.868722 - 6.445183		723
		WTR_VTR28	WTR_VTR28 IMG_1500	Photographic still	59.868675 - 6.445304		723
		WTR_VTR28	WTR_VTR28 IMG_1501	Photographic still	59.868610 - 6.445387		723
		WTR_VTR28	WTR_VTR28 IMG_1502	Photographic still	59.868498 - 6.445534		722
		WTR_VTR28	WTR_VTR28 IMG_1503	Photographic still	59.868395 - 6.445705		723
		WTR_VTR28	WTR_VTR28 IMG_1504	Photographic still	59.868322 - 6.445805		722
		WTR_VTR28	WTR_VTR28 IMG_1506	Photographic still	59.868131 - 6.446057		720
		WTR_VTR28	WTR_VTR28 IMG_1507	Photographic still	59.868102 - 6.44608		721
		WTR_VTR28	WTR_VTR28 IMG_1508	Photographic still	59.868023 - 6.446153		720
		WTR_VTR28	WTR_VTR28 IMG_1509	Photographic still	59.867967 - 6.446206		720
		WTR_VTR28	WTR_VTR28 IMG_1510	Photographic still	59.867879 - 6.446293		715
		WTR_VTR28	WTR_VTR28 IMG_1512	Photographic still	59.867712 - 6.446501		718
		WTR_VTR28	WTR_VTR28 IMG_1513	Photographic still	59.867614 - 6.446575		719
		WTR_VTR28	WTR_VTR28 IMG_1514	Photographic still	59.867562 - 6.446700		719
		WTR_VTR28	WTR_VTR28 IMG_1515	Photographic still	59.867471 - 6.446800		719
		WTR_VTR28	WTR_VTR28 IMG_1516	Photographic still	59.867429 - 6.446851		718
		WTR_VTR28	WTR_VTR28 IMG_1517	Photographic still	59.867362 - 6.447009		717
		WTR_VTR28	WTR_VTR28 IMG_1518	Photographic still	59.867274 - 6.447117		717
		WTR_VTR28	WTR_VTR28 IMG_1519	Photographic still	59.867210 - 6.447364		717
		WTR_VTR28	WTR_VTR28 IMG_1520	Photographic still	59.867116 - 6.447556		716

Species	Conservation Interest	Video Tow (event)	Sample Ref	Method	Position start / point	Position End	Depth (m bsl)
Deep water coral (*Lophelia pertusa*)	UK Sp Conservation Importance	WTR_VTR28	WTR_VTR28 IMG_1521	Photographic still	59.867103 - 6.447756		716
		WTR_VTR28	WTR_VTR28 IMG_1522	Photographic still	59.867053 - 6.447925		715
		WTR_VTR28	20121102 WTR_VTR28 V Hab 2	Towed Video	59.869433 - 6.11035	59.86695 -6.11515	723
Deep water coral (Lophelia pertusa) - potential	UK Sp Conservation Importance	WTR_VTR14	WTR_VTR14 IMG_0802	Photographic still	59.907894 - 6.603428		538
		WTR_VTR14	WTR_VTR14 IMG_0819	Photographic still	59.906915 - 6.605376		564
		WTR_VTR25	20121102_WTR_VTR25 VHab1	Towed Video	59.9185 - 6.063333	59.9144 - 6.06785	775
Deep water coral (Lophelia pertusa and / or Madrepora oculata)	UK Sp Conservation Importance	WTR_VTR26	20121102_WTR_VTR26_VHab 1	Towed Video	59.927983 - 6.093333	59.924516 - 6.098733	749
Octocorallia	Scottish Biodiversity List	WTR VTR15	WTR VTR15_0879	Photographic still	59.92088 -6.64714		486
		WTR VTR16	WTR VTR16_0889	Photographic still	59.9181 - 6.66838		547
		WTR VTR16	WTR VTR16_0893	Photographic still	59.91801 -6.66879		549
		WTR VTR16	WTR VTR16_0903	Photographic still	59.91759 -6.67031		555
		WTR VTR16	WTR VTR16_0942	Photographic still	59.91588 -6.67542		583
		WTR VTR29	WTR VTR29 IMG_1526	Photographic still	59.87076 -5.95148		701
		WTR VTR29	WTR VTR29 IMG_1527	Photographic still	59.87065 -5.95161		700
		WTR VTR29	WTR VTR29 IMG_1528	Photographic still	59.87062 -5.95166		700
		WTR VTR29	WTR VTR29 IMG_1529	Photographic still	59.87054 -5.95177		700
		WTR VTR29	WTR VTR29 IMG_1530	Photographic still	59.87046 -5.95186		700
		WTR VTR29	WTR VTR29 IMG_1531	Photographic still	59.87039 -5.95194		700
		WTR VTR29	WTR VTR29 IMG_1532	Photographic still	59.87032 -5.95204		695
		WTR VTR29	WTR VTR29 IMG_1533	Photographic still	59.87027 -5.95209		695
		WTR VTR29	WTR VTR29 IMG_1534	Photographic still	59.87021 -5.95217		693
		WTR VTR29	WTR VTR29 IMG_1535	Photographic still	59.8701 - 5.95234		691
		WTR VTR29	WTR VTR29 IMG_1536	Photographic still	59.87005 -5.95242		691
		WTR VTR29	WTR VTR29 IMG_1537	Photographic still	59.86997 -5.95249		691

Species	Conservation Interest	Video Tow (event)	Sample Ref	Method	Position start / point	Position End	Depth (m bsl)
Octocorallia	Scottish Biodiversity List	WTR VTR29	WTR VTR29 IMG_1538	Photographic still	59.86992 -5.95251		690
		WTR VTR29	WTR VTR29 IMG_1539	Photographic still	59.86987 -5.95256		689
		WTR VTR29	WTR VTR29 IMG_1540	Photographic still	59.86983 -5.95257		685
		WTR VTR29	WTR VTR29 IMG_1541	Photographic still	59.86973 -5.95264		683
		WTR VTR29	WTR VTR29 IMG_1542	Photographic still	59.86967 -5.95272		683
		WTR VTR29	WTR VTR29 IMG_1543	Photographic still	59.86963 -5.95276		682
		WTR VTR29	WTR VTR29 IMG_1544	Photographic still	59.86954 -5.95278		681
		WTR VTR29	WTR VTR29 IMG_1545	Photographic still	59.86947 -5.95286		681
		WTR VTR29	WTR VTR29 IMG_1546	Photographic still	59.86942 -5.95292		681
		WTR VTR29	WTR VTR29 IMG_1547	Photographic still	59.86937 -5.95303		679
		WTR VTR29	WTR VTR29 IMG_1548	Photographic still	59.86932 -5.95313		679
		WTR VTR29	WTR VTR29 IMG_1549	Photographic still	59.86921 -5.9533		677
		WTR VTR29	WTR VTR29 IMG_1550	Photographic still	59.86917 -5.95334		679
		WTR VTR29	WTR VTR29 IMG_1551	Photographic still	59.86914 -5.95343		678
		WTR VTR29	WTR VTR29 IMG_1552	Photographic still	59.86905 -5.95352		676
		WTR VTR29	WTR VTR29 IMG_1553	Photographic still	59.86898 -5.9536		674
		WTR VTR29	WTR VTR29 IMG_1554	Photographic still	59.86891 -5.95368		675
		WTR VTR29	WTR VTR29 IMG_1555	Photographic still	59.86887 -5.95377		675
		WTR VTR29	WTR VTR29 IMG_1556	Photographic still	59.86879 -5.95392		668
		WTR VTR29	WTR VTR29 IMG_1557	Photographic still	59.86875 -5.95398		666
		WTR VTR29	WTR VTR29 IMG_1558	Photographic still	59.8687 - 5.95406		671
		WTR VTR29	WTR VTR29 IMG_1559	Photographic still	59.86862 -5.9542		666
		WTR VTR29	WTR VTR29 IMG_1560	Photographic still	59.86856 -5.95433		663
		WTR VTR29	WTR VTR29 IMG_1561	Photographic still	59.86851 -5.95446		661
		WTR VTR29	WTR VTR29 IMG_1562	Photographic still	59.86845 -5.95459		661
		WTR VTR29	WTR VTR29 IMG_1563	Photographic still	59.8684 - 5.95474		660
		WTR VTR29	WTR VTR29 IMG_1564	Photographic still	59.86836 -5.95486		660

Species	Conservation Interest	Video Tow (event)	Sample Ref	Method	Position start / point	Position End	Depth (m bsl)
Octocorallia	Scottish Biodiversity List	WTR VTR29	WTR VTR29 IMG_1565	Photographic still	59.8683 -5.95507		659
		WTR VTR29	WTR VTR29 IMG_1566	Photographic still	59.86811 -5.95554		657
		WTR VTR29	WTR VTR29 IMG_1567	Photographic still	59.86803 -5.95569		651
		WTR VTR29	WTR VTR29 IMG_1568	Photographic still	59.86798 -5.95578		649
		WTR VTR29	WTR VTR29 IMG_1569	Photographic still	59.86793 -5.95593		649
		WTR VTR29	WTR VTR29 IMG_1570	Photographic still	59.86786 -5.95611		644
		WTR VTR29	WTR VTR29 IMG_1571	Photographic still	59.86779 -5.95622		643
		WTR VTR29	WTR VTR29 IMG_1572	Photographic still	59.86774 -5.95628		646
		WTR VTR29	WTR VTR29 IMG_1573	Photographic still	59.8677 -5.95632		646
		WTR VTR29	WTR VTR29 IMG_1574	Photographic still	59.86762 -5.95643		645
		WTR VTR29	WTR VTR29 IMG_1575	Photographic still	59.86759 -5.95648		640
		WTR VTR29	WTR VTR29 IMG_1576	Photographic still	59.86755 -5.95656		641
		WTR VTR29	WTR VTR29 IMG_1577	Photographic still	59.86753 -5.9566		640
		WTR VTR29	WTR VTR29 IMG_1578	Photographic still	59.86744 -5.95671		639
		WTR VTR29	WTR VTR29 IMG_1579	Photographic still	59.8674 -5.95682		639
		WTR VTR29	WTR VTR29 IMG_1580	Photographic still	59.86734 -5.95692		637
		WTR VTR29	WTR VTR29 IMG_1581	Photographic still	59.86729 -5.95707		637
		WTR VTR29	WTR VTR29 IMG_1582	Photographic still	59.86718 -5.95718		635
		WTR_VTR12	WTR_VTR12 IMG_0755	Photographic still	59.941507 -6.713178		510
		WTR_VTR12	WTR_VTR12 IMG_0762	Photographic still	59.941337 -6.712829		510
		WTR_VTR16	20121102_WTR_VTR16 Hab 1	Towed Video	59.918216 -6.001333	59.914966 -6.011433	546
		WTR_VTR29	20121102WTR_VTR29 V Hab 1	Towed Video	59.87075 -5.951483	59.867133 -5.957283	701
Octocorallia - potential	Scottish Biodiversity List	WTR_VTR12	WTR_VTR12 IMG_0741	Photographic still	59.943011 -6.712930		502
Gorgonacea	IUCN Red List	WTR_VTR06	WTR_VTR06 IMG_0464	Photographic still	59.901699 -6.560997		460
Blue Ling *(Molva dypterygia)*	*UK Biodiversity Action Plan priority species*	*See Table 10 for detail*					

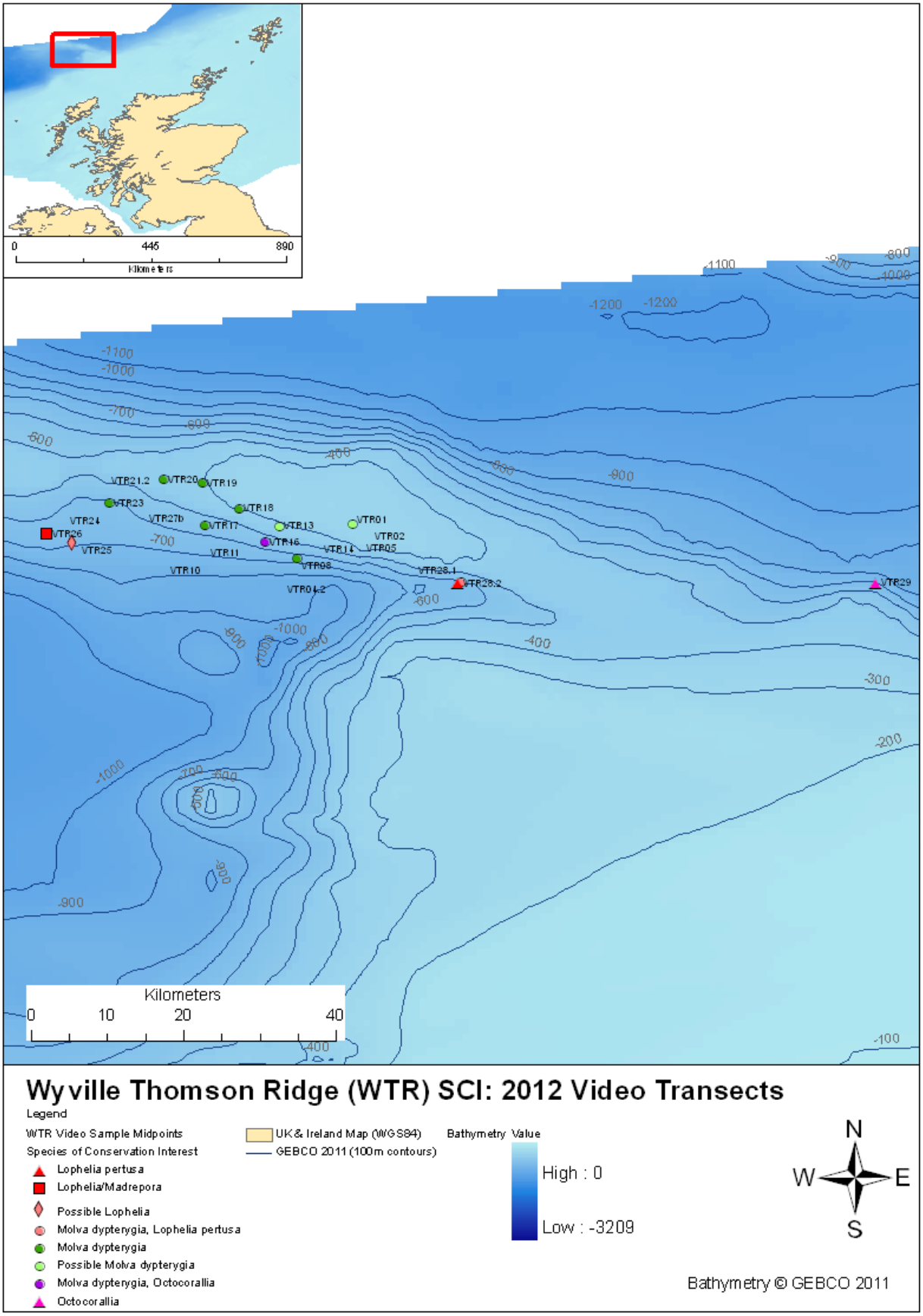


Figure 6. Locations of species of conservation importance identified in the 2012 WTR seabed imagery surveys. Individual video sample centre points (WTR Video Points) are displayed. Photo samples (WTR Stills Points), taken at approximately 20 or 60 second intervals, were analysed from all stations however are not visible at the current map scale.

3.1.7 Taxon Richness

The current report provides an introduction to the taxon richness found on the Wyville Thomson Ridge, but more detailed analysis of this data is required before any solid conclusions can be drawn about taxon richness.

Taxon richness was calculated as all individual taxa, or 'species' as entered into Marine Recorder, including all species, individual morphotypes, groups of species or genera with qualifiers within a sample. In addition to recording all individual encrusting Porifera and Bryozoan taxa, surveyors were also asked to consistently record the overall abundance of 'all' Porifera and Bryozoa crusts (to ensure that their overall presence was recorded if individual taxon were not).

Taxon richness has been entered into Marine Recorder as number of taxa for each still image per 1.6m^2 (size of the still image) or for the video sample area. For the presentation of results the number of taxa has been standardised and is presented as the number of taxa per m^2, referred to herafter as taxa per m^2.

Almost 4% of Wyville Thomson Ridge (WTR) images analysed contained no taxon at all, 11% contained more than 10 taxa per m^2, 89% contained less than 10 taxa per m^2. The maximum taxon richness observed on the WTR was 15.6 taxa per m^2 (25 taxa in 1.6m^2) in three single images at WTR_VTR29 (Figure 7). This was also the only video transect where Annex 1 rocky reef was also present. Several individual images from seven video transects had no taxa at all associated to them (WTR_VTRs 6, 8, 12, 13, 15, 16 and 23). 'Bands' of points in Figure 7 represent a large number of images with this number of taxa per m^2, for example 75 images had a standardised taxon richness of 3.75 taxa per m^2.

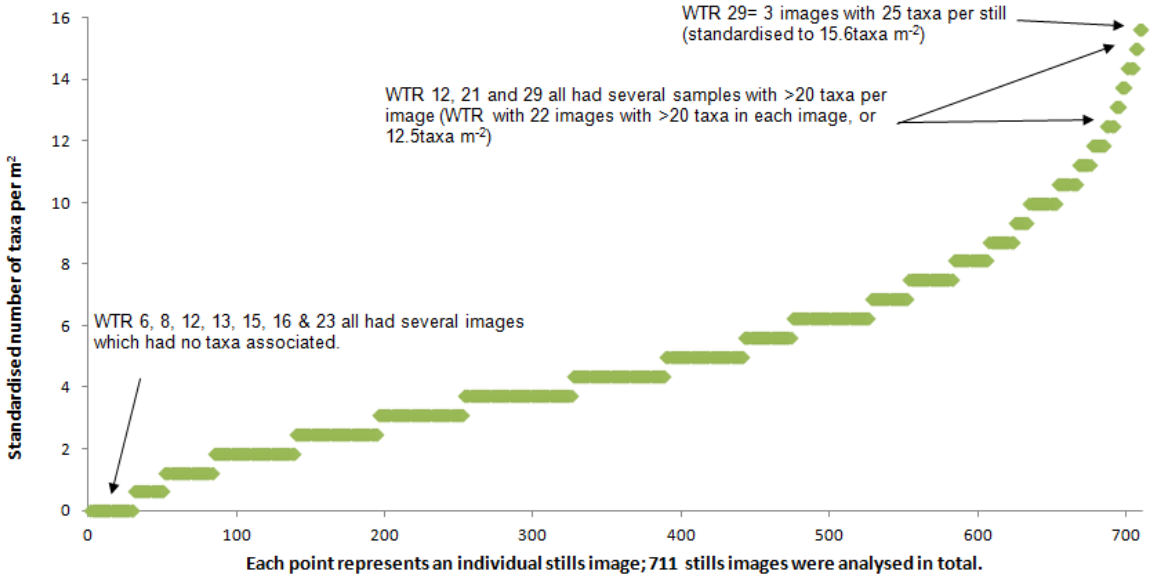


Figure 7. Taxon richness (standardised to taxa per m^2) assigned following seabed imagery analysis of the Wyville Thomson Ridge SCI, 2012.

No clear pattern could be seen in the taxon richness over the survey area (Figures 8 & 9). The number of taxa observed in video tows ranging between 700 and 2,200m^2 was often less than the number of taxa observed in the average image of 1.6m^2 (Figure 8), which is solely down to the better resolution of stills (up to 25 taxa per sample) versus video (up to 14 taxa per sample). These numbers can not be standardised as the taxon richness was cumulative over a tow. However, despite the best efforts of quality assurance, taxon richness must not be over-analysed as differences in surveyor observations with such low numbers of

taxa may account for apparent differences in taxon richness between tows. One example of this is that if one surveyor forgot to record 'total' Bryozoa and Porifera crusts (although they were recording individual identifyable crust taxon, just not the category of 'all' crusts), two tows may already have a difference in two taxa. Figure 8 confirms that video alone is not of high enough quality to soley assess taxon richness.

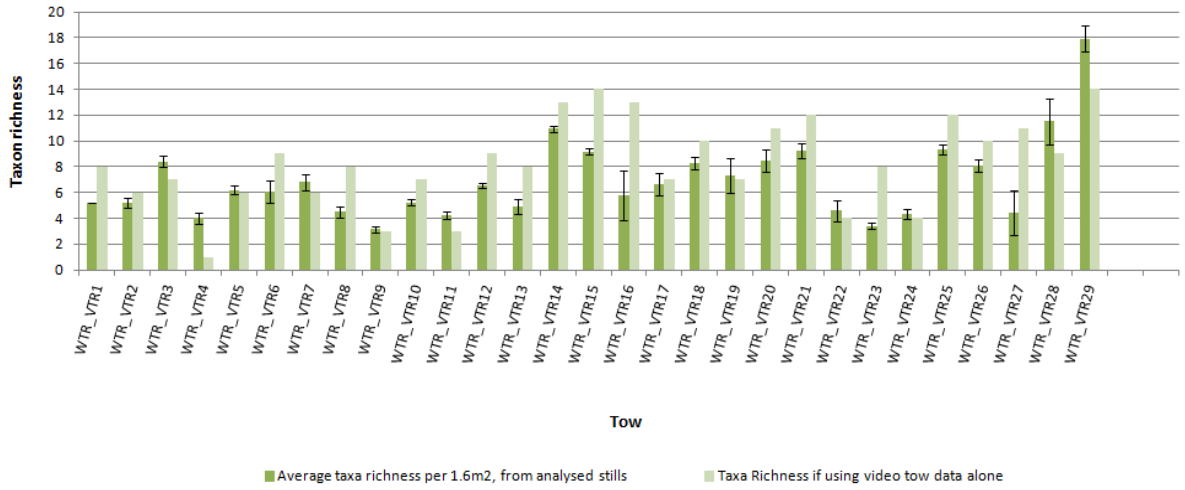


Figure 8. Taxon richness from seabed imagery analysis at Wyville Thomson Ridge SCI. Dark green bars represent the average richness per still over than entire transect taken from stills, together with standard error bars. Light green bars are the total number of taxa observed over the whole tow from video (over two habitats for several samples).

The video tows from some stations showed more taxon richness than the average stills image (Figure 8). An example of this is WTR VTR16, where a brief look at the data shows that the higher number of species could be related to the video picking up larger mobile species which images do not. Where taxon richness was higher in stills than video, for example in WTR VTR29, there were fewer large mobile species but more diversity in smaller cryptic species. However, more frequent stills along the tow might even out these differences and pick up more large mobile species eventually. A brief look at the raw data also shows differences in the video taxon list compared to the stills taxon list, with several Asteroids being recorded at a higher level, and some taxon being missed altogether from video samples (for example Serpulids or indivdual Porifera crusts).

The current report provides an introduction to the taxon richness found on the Wyville Thomson Ridge, but more detailed analysis of this data is required before any solid conclusions can be drawn about taxon richness.

Appendix 3 provides an average taxon richness found per tow, calculated as an average number of species for all the images associated with a given camera tow.

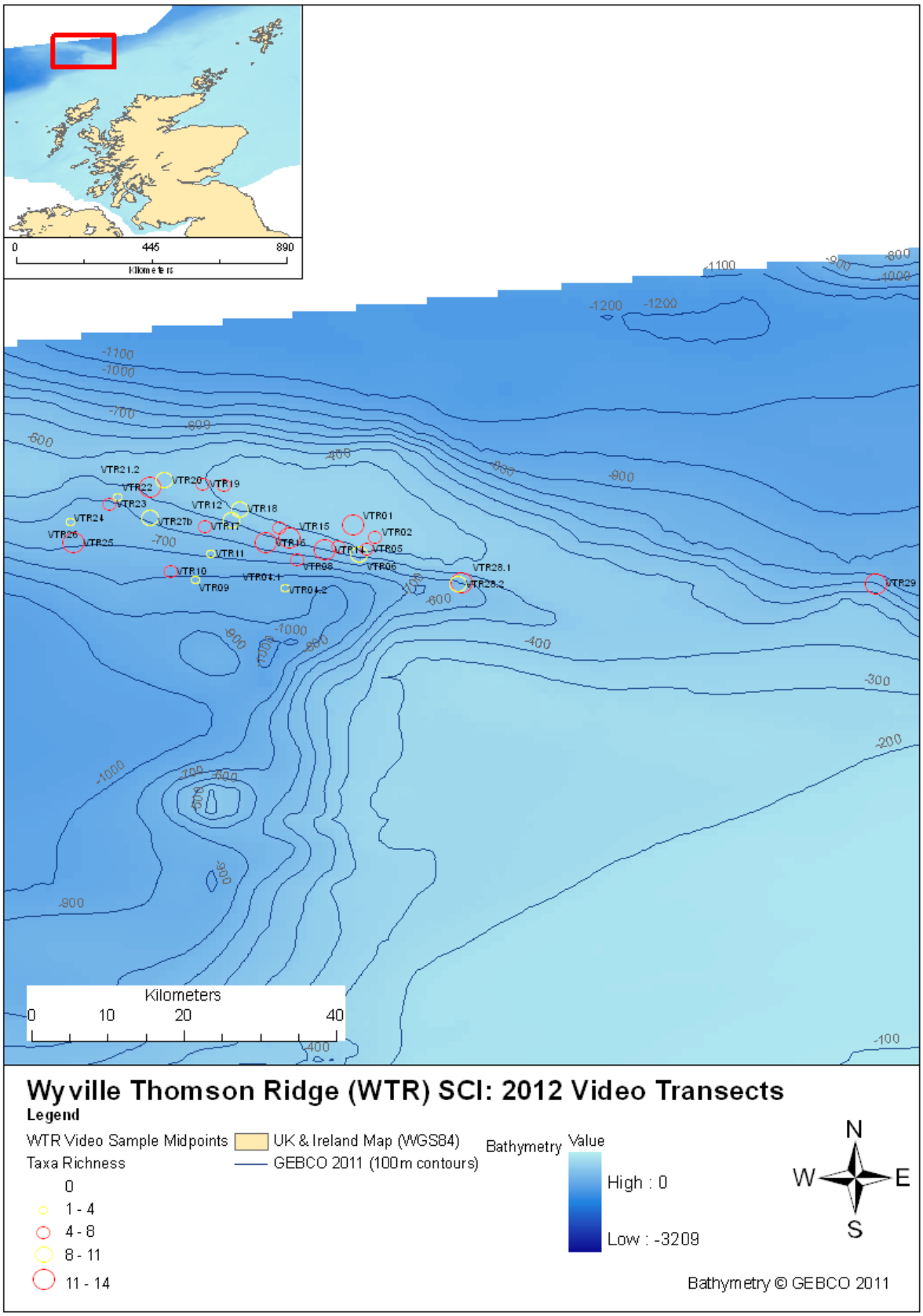
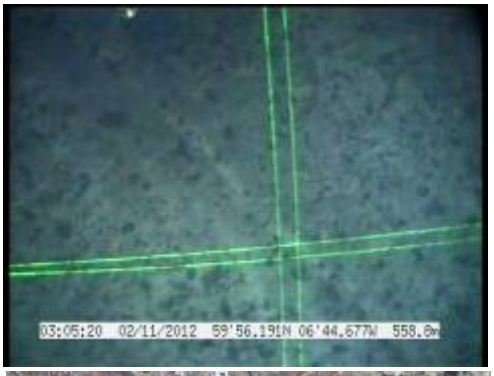
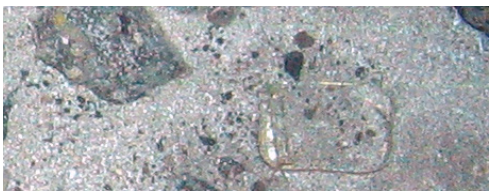


Figure 9. Distribution of taxon richness assigned following seabed imagery analysis of the Wyville Thomson Ridge SCI, 2012. Taxon richness from video samples alone is presented, with areas ranging from 700m^2 - 1,600m^2. Individual video sample centre points (WTR Video Points) are displayed. Photo samples (WTR Stills Points), taken at approximately 20 or 60 second intervals, were also analysed from all stations but are not visible at the current map scale.

3.1.8 Evidence of trawling, disturbance and litter identified

Examples of some types of evidence of trawling and litter observed on the Wyville Thomson Ridge are provided in Table 13.

Table 13. Evidence of trawling and litter in the Wyville Thomson Ridge SCI survey area, 2012.

Disturbance Feature	Example image	Image taken from sample:
Potential trawl marks		WTR_VTR5 IMG_0385
Potential trawl marks		WTR_VTR17 V Hab 1
Rope over Madrepora		WTR_VTR28 IMG_1503
Sardine tin & oil filter	 	WTR VTR20 IMG_1139

In total, six possible incidences of trawl scars or potential evidence of trawling, otter beam marks or possible dragging pot marks were seen in the Wyville Thomson Ridge SCI tows, the deepest incidence of which was recorded at 623m below sea level. Thirty seven incidences of litter, predominately rope and cable, were also recorded (listed in Table 14, displayed on a map in Figure 10).

Table 14. Positions of evidence of trawling and litter in the Wyville Thomson Ridge SCI survey area, 2012.

Disturbance Feature	Video Tow (event)	Sample Ref	Method	Position start / point	Position End	Depth (m bsl)
Rope & other litter	WTR_VTR1	20121028_WTR_VTR1_Hab1	Towed Video	59.9387 - 6.0631	59.933833 -6.077833	336
Rope	WTR_VTR1	WTR_VTR1 IMG_0108	Photographic Still	59.937029 -6.570564		340
Rope	WTR_VTR13	WTR_VTR13 IMG_0049	Photographic Still	59.932673 -6.659863		408
Rope	WTR_VTR14	20121101_WTR_VTR14_Hab1	Towed Video	59.909616 -6.10025	59.906266 -6.1065	484
Cable	WTR_VTR14	WTR_VTR14 IMG_0779	Photographic Still	59.909113 -6.60119		500
Hook	WTR_VTR14	WTR_VTR14 IMG_0788	Photographic Still	59.908474 -6.60233		519
Rope	WTR_VTR14	WTR_VTR14 IMG_0808	Photographic Still	59.907489 -6.604223		550
Rope	WTR_VTR14	WTR_VTR14 IMG_0809	Photographic Still	59.907447 -6.604260		550
Potential trawl marks	WTR_VTR15	20121102_WTR_VTR15 Hab1	Towed Video	59.923933 -6.1425	59.920416 -6.148016	441
Potential trawl marks	WTR_VTR16	20121102_WTR_VTR16 Hab 1	Towed Video	59.918216 -6.001333	59.914966 -6.011433	546
Rope	WTR_VTR16	WTR VTR16_0887	Photographic Still	59.91818 - 6.66819		546
Unidentified litter	WTR_VTR16	WTR VTR16_0933	Photographic Still	59.9163 - 6.67414		576
Definite trawl marks	WTR_VTR17	20121102_WTR_VTR17 Hab1	Towed Video	59.938366 -6.0782	59.93375 - 6.076733	554
Rope	WTR_VTR17	WTR VTR17_0972	Photographic Still	59.93803 - 6.74482		555
Rope	WTR_VTR18	WTR VTR18__1024	Photographic Still	59.95492 - 6.70272		372
Rope	WTR_VTR18	WTR VTR18__1028	Photographic Still	59.9554 - 6.703		369
Definite trawl marks	WTR_VTR19	20121102_WTR_VTR19_VHab1	Towed Video	59.983866 -6.077983	59.988416 -6.080666	373
Rope	WTR_VTR2	20121028 WTR_VTR2_Hab1	Towed Video	59.923016 -6.037066	59.923966 -6.048333	348
Rope	WTR_VTR20	20121102_WTR_VTR20_VHab1	Towed Video	59.98805 - 6.127	59.9927 - 6.127	433
Sardine tin, oil filter	WTR_VTR20	WTR VTR20 IMG_1139	Photographic Still	59.99066 - 6.79252		430
Rope	WTR_VTR21	20121102_WTR_VTR21_VHab2	Towed Video	59.980783 -6.80885	59.9838 - 6.140683	479
Rope	WTR_VTR21	WTR VTR21 IMG_0071	Photographic Still	59.98141 - 6.80867		474
Rope	WTR_VTR21	WTR VTR21 IMG_0075	Photographic Still	59.98194 - 6.80848		470
Rope	WTR_VTR21	WTR VTR21 IMG_0091	Photographic Still	59.98372 - 6.80746		464
Rope	WTR_VTR21	WTR VTR21 IMG_0092	Photographic Still	59.98378 - 6.80739		464
Rope	WTR_VTR22	20121102_WTR_VTR22 VHab1	Towed Video	59.969 - 6.01465	59.9738 - 6.0105	609
Unidentified litter	WTR_VTR23	20121102_WTR_VTR23 VHab1	Towed Video	59.9645 - 6.01935	59.960566 -6.024916	605

Disturbance Feature	Video Tow (event)	Sample Ref	Method	Position start / point	Position End	Depth (m bsl)
Wire	WTR_VTR23	WTR VTR23 IMG_1213	Photographic Still	59.96345 -6.85459		605
Rope	WTR_VTR28	20121102 WTR_VTR28 V Hab 2	Towed Video	59.869433 -6.11035	59.86695 - 6.11515	723
Rope	WTR_VTR28	WTR_VTR28 IMG_1499	Photographic Still	59.868722 -6.445183		723
Rope	WTR_VTR28	WTR_VTR28 IMG_1500	Photographic Still	59.868675 -6.445304		723
Rope	WTR_VTR28	WTR_VTR28 IMG_1503	Photographic Still	59.868395 -6.445705		723
Rope	WTR_VTR28	WTR_VTR28 IMG_1508	Photographic Still	59.868023 -6.446153		720
Potential trawl marks	WTR_VTR5	20121101_WTR_VTR5_Hab1	Towed Video	59.91145 - 6.053316	59.906866 -6.054016	356
Rope & other litter	WTR_VTR5	20121101_WTR_VTR5_Hab1	Towed Video	59.91145 - 6.053316	59.906866 -6.054016	356
Rope	WTR_VTR6	20121101_WTR_VTR6 Hab1	Towed Video	59.904483 -6.065166	59.9008 - 6.059716	427
Rope	WTR_VTR6	WTR_VTR06 IMG_0454	Photographic Still	59.902369 -6.562302		452
Rope	WTR_VTR6	WTR_VTR06 IMG_0468	Photographic Still	59.901375 -6.560501		466
Rope	WTR_VTR6	WTR_VTR06 IMG_0471	Photographic Still	59.900968 -6.559944		469
Rope	WTR_VTR6	WTR_VTR06 IMG_0472	Photographic Still	59.900891 -6.559815		469
Potential trawl marks	WTR_VTR8	20121101_WTR_VTR8_Hab 1	Towed Video	59.899883 -6.636683	59.895883 -6.633566	623
Rope	WTR_VTR8	WTR VTR8__0550	Photographic Still	59.897 - 6.63451		658
Wire	WTR_VTR8	WTR VTR8__0556	Photographic Still	59.89658 - 6.63396		671

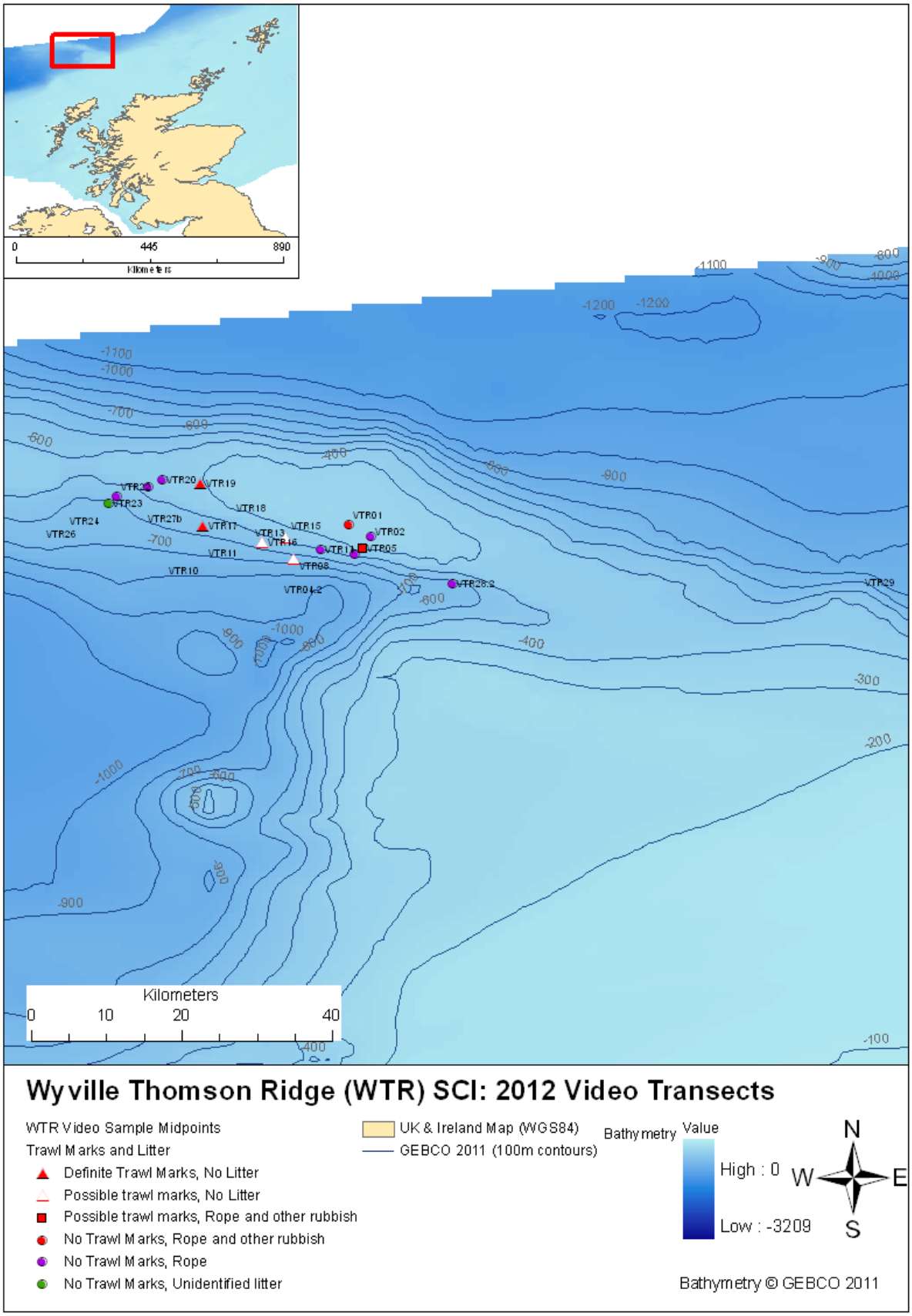


Figure 10. Locations of evidence of trawling, disturbance and litter on the Wyville Thompson Ridge SCI survey area in 2012. Individual video sample centre points (WTR Video Points) are displayed. Photo samples (WTR Stills Points), taken at approximately 20 or 60 second intervals, were analysed from all stations however are not visible at the current map scale.

3.2 Faroe-Shetland Sponge Belt Scottish Nature Conservation MPA Proposal

3.2.1 Summary of seabed imagery analysed

In total over 31.4km of video transects were taken over 32 tows within the Faroe-Shetland Sponge Belt and FSC_B surrounding area in 2012, with a total surveyed area of approximately 50,308m^2. Figure 11 shows the locations of the 2012 FSC transects.

Eighteen of the 32 seabed imagery transects had stills taken every 20 seconds, although only 15 of these were fully analysed. Table 15 provides a breakdown of each camera transect. Only four of the video transects were found to have two clear habitats, whilst most tows were thought to be either of a single habitat or a mosaic of two habitats.

Appendix 4 presents a more detailed summary of each FSC seabed imagery transect.

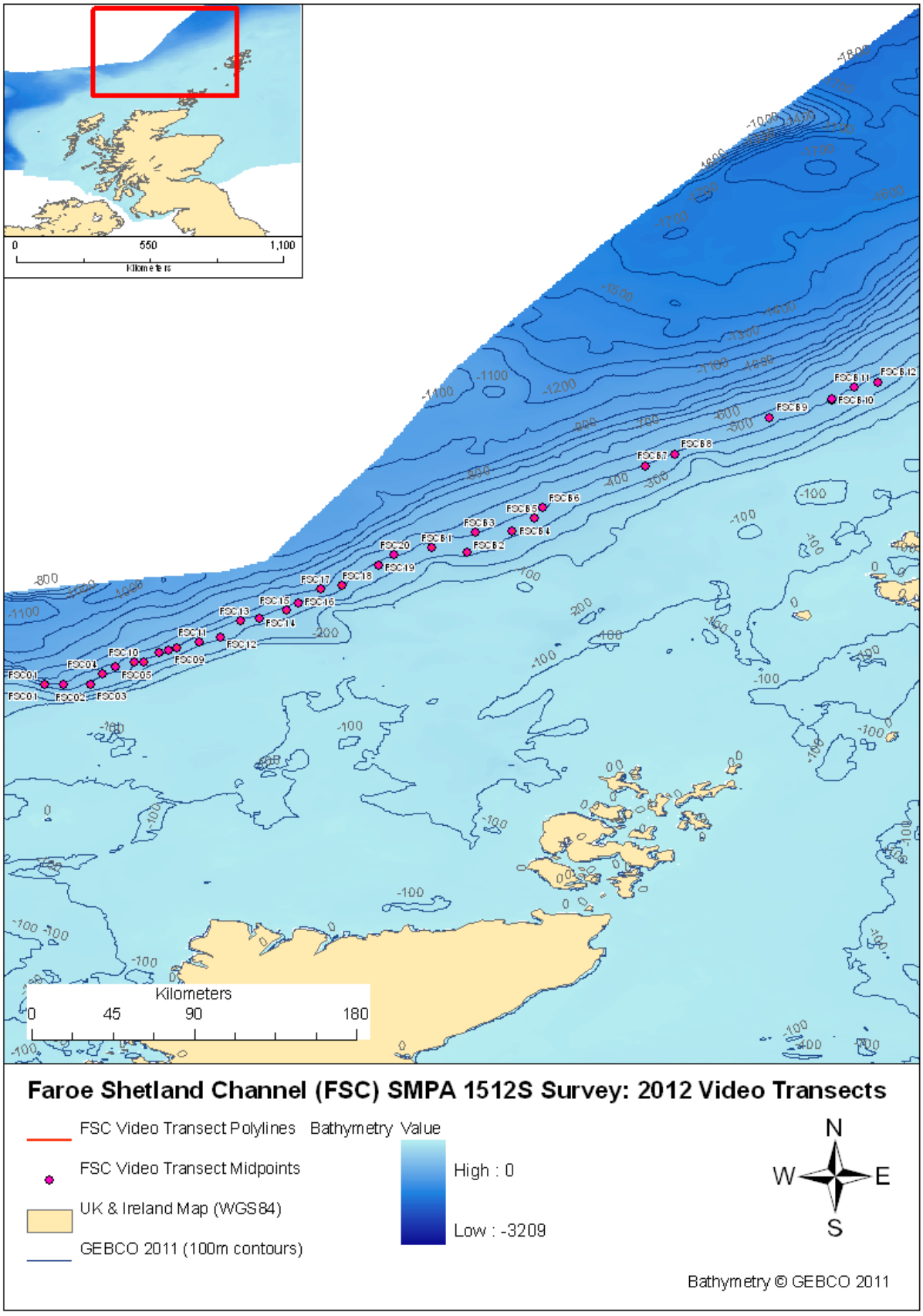


Figure 11. Map showing the location of the 2012 Faroe-Shetland Sponge Belt Scottish Nature Conservation MPA Proposal survey area (FSC Scottish Location Box), individual video samples (FSC Video Polylines) and video sample centre points (FSC Video Points). Photo samples (FSC Stills Points), taken at approximately 20 or 60 second intervals, were analysed from all stations however are not visible at the current map scale.

Table 15. Summary of each FSC tow and the number of video and photographic stills samples provided and analysed within each. Twelve tows (emboldened) where stills were taken every 20 seconds were fully analysed, whilst others were sub-sampled. [R00] Repeat transects of SEA SAC4 survey (DTI 2003). [R96] Repeat transects of AFEN survey (Axellson 2003).

Tow	Position Start	Position End	Length of Tow (m)	Approx area (m^2) of Tow analysed	Stills interval	Number of Stills	Number of stills analysed[!]	Number of video habitats analysed
FSC01	**59.794266 -5.827683**	**59.7858 - 5.8282**	**1058**	**1693**	**60**	**46**	**41**	**2**
FSC02	**59.790833 -5.734066**	**59.782026 -5.737253**	**1097**	**1755**	**60**	**62**	**55**	**1**
FSC03	**59.783266 -5.60615**	**59.790083 -5.596666**	**985**	**1577**	**20**	**39**	**35**	**1**
FSC04	**59.836033 -5.551683**	**59.84325 - 5.53995**	**1146**	**1834**	**60**	**49**	**45**	**1**
FSC05[R00]	59.8756 - 5.481233	59.884 - 5.474116	1008	1612	60	41	19	1
FSC06	59.897233 -5.3379	59.905533 -5.3303	1083	1733	60	45	8	1
FSC07	59.942333 -5.259016	59.951566 -5.2589	1033	1654	60	45	11	1
FSC08	**59.976633 -5.164666**	**59.968366 -5.17825**	**1219**	**1951**	**60**	**104**	**85**	**1**
FSC09	**59.9618 - 5.211816**	**59.952816 -5.211816**	**1000**	**1600**	**20**	**81**	**78**	**1**
FSC10	**59.9033 - 5.387766**	**59.8941 - 5.386133**	**1050**	**1681**	**20**	**72**	**62**	**1**
FSC11[R96]	**60.004316 -5.060983**	**59.9952 - 5.0602**	**1018**	**1628**	**20**	**75**	**73**	**1**
FSC12	**60.025483 -4.9551**	**60.020366 -4.95365**	**961**	**1537**	**20**	**40**	**31**	**2**
FSC13	**60.102883 -4.859083**	**60.107666 -4.859683**	**564**	**903**	**20**	**49**	**44**	**1**
FSC14	**60.117066 -4.763066**	**60.1234 - 4.76495**	**1062**	**1699**	**20**	**76**	**67**	**2**
FSC15	60.152033 -4.6311	60.160133 -4.623666	1110	1776	60	39	8	1
FSC16	60.192883 -4.56125	60.200333 -4.571266	1015	1624	60	65	12	1
FSC17	60.2612 - 4.451366	60.26555 - 4.466083	990	1584	60	41	8	1
FSC18	60.279166 -4.344983	60.283216 -4.361383	1013	1621	60	39	12	1
FSC19	60.38005 -4.166083	60.380466 -4.174783	484	775	60	17	13	1
FSC20	**60.433183 -4.087816**	**60.4364 - 4.093883**	**497**	**795**	**20**	**23**	**20**	**1**
FSC_B1	60.467216 -3.898666	60.473933 -3.91065	1000	1600	60	22	17	1
FSC_B2	**60.44275 -3.728783**	**60.451616 -3.731616**	**977**	**1562**	**20**	**71**	**61**	**1**
FSC_B3	**60.540833 -3.68255**	**60.548816 -3.6911**	**1045**	**1672**	**20**	**66**	**63**	**1**
FSC_B4	**60.5484 - 3.504883**	**60.556866 -3.499316**	**1082**	**1731**	**20**	**67**	**62**	**1**
FSC_B5	**60.6209 - 3.39485**	**60.612733 -3.3917**	**1014**	**1623**	**20**	**69**	**65**	**1**
FSC_B6	60.6748 - 3.35455	60.665566 -3.352883	1032	1652	20	77	8	1
FSC_B7	60.881466 -2.84545	60.871516 -2.844366	1135	1816	20	62	10	1
FSC_B8	60.9484 - 2.6934	60.939766 -2.701916	1034	1655	20	75	18	1
FSC_B9	**61.1135 -**	**61.122666**	**1112**	**1779**	**20**	**70**	**62**	**1**

Tow	Position Start	Position End	Length of Tow (m)	Approx area (m^2) of Tow analysed	Stills interval	Number of Stills	Number of stills analysed[!]	Number of video habitats analysed
	2.220616	-2.227116						
FSC_B10	61.2086 - 1.912466	61.21075 - 1.911883	554	887	60	35	22	2
FSC_B11	61.2628 - 1.802383	61.271983 -1.802533	1038	1660	20	71	67	1
FSC_B12	61.291366 -1.683666	60.30015 - 1.68905	1025	1640	20	76	67	1
		Totals	31443	50308		1809	1249	36

3.2.2 Summary of EUNIS Habitats present

Habitats (EUNIS level 3) were assigned to stills and video clips using information from EUNIS guidance (Davies et al, 2004). Four EUNIS level 3 habitats were identified within the FSC tows: deep-sea mixed substrata which dominated the video transects (present in 30), and deep-sea sand, present in five video tows, deep sea mud present in only one video tow, and deep-sea muddy sand, only evident in two stills images (Table 16).

Table 16. EUNIS Habitats (level 3) assigned to FSC imagery and the number of tows, video and stills samples each was assigned to.

EUNIS Habitat code	EUNIS level	No of video samples present in:	No of stills present in:
Deep-sea mixed substrata (A6.2)	3	29	946
Deep-sea mixed substrata (A6.2) & Deep Sand (A6.3)	3	1	1
Deep-sea mud (A6.5)	3	1	61
Deep-sea sand (A6.3)	3	4	238
Deep-sea muddy sand (A6.4)	3	0	2

A map of the locations of these EUNIS habitats is provided in Figure 12.

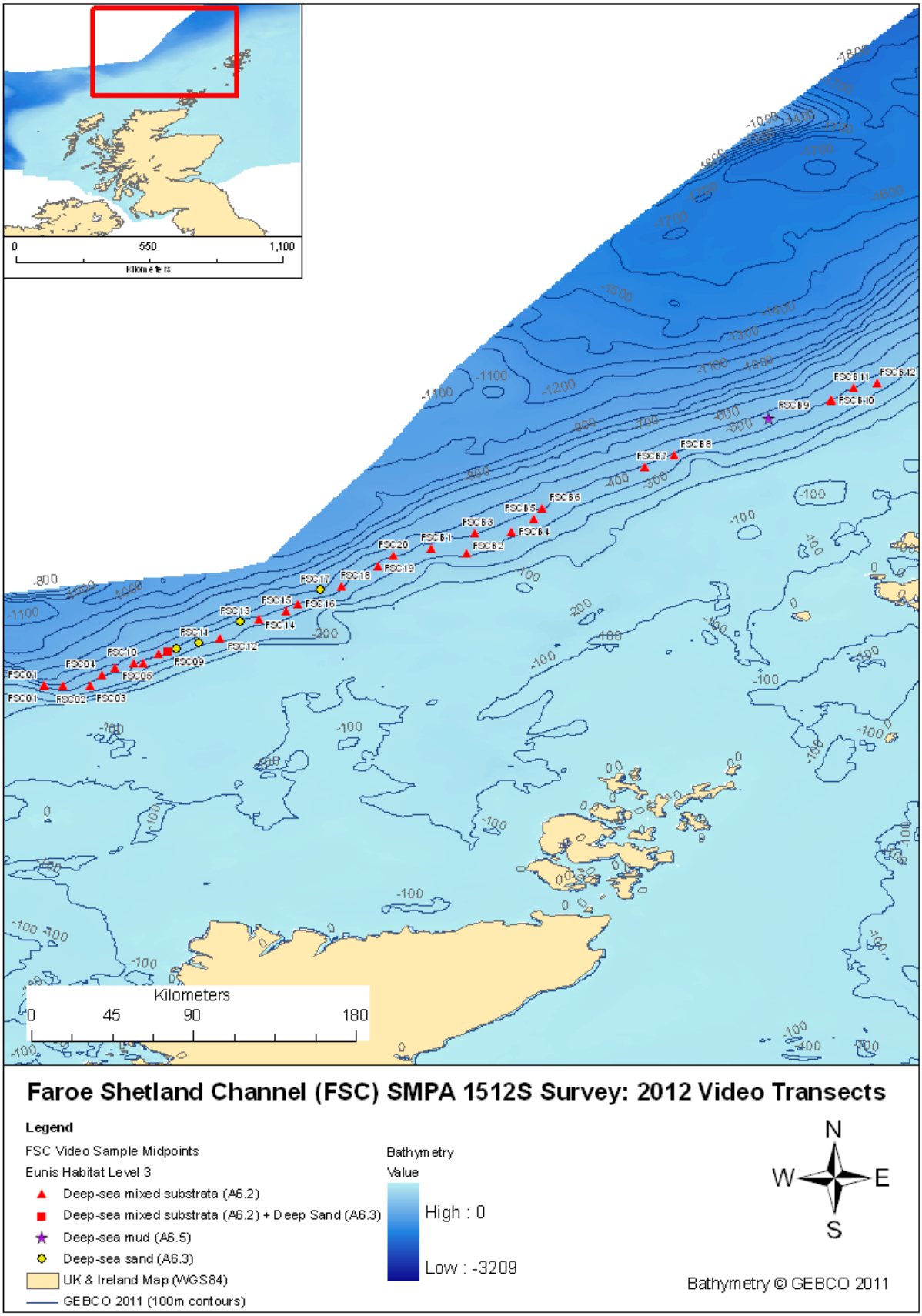


Figure 12. Location of EUNIS habitats within the 2012 Faroe-Shetland Sponge Belt Scottish Nature Conservation MPA Proposal survey area (FSC Scottish Location Box), displaying individual video sample centre points (FSC Video Points) only. Photo samples (FSC Stills Points), taken at approximately 20 or 60 second intervals, were analysed from all stations however are not visible at the current map scale.

3.2.3 Description of habitat types present

Five broad habitat types (of a mix of habitat classification systems) were observed in the Faroe-Shetland Sponge Belt (FSC) survey: 1) potential Annex 1 Reef, 2) low quality reef (not of high enough quality to be deemed Annex 1 "reef"), 3) bathyal mixed substrates, 4) bathyal sand and 5) bathyal mud with sand. Examples of these together with the number of samples of each are presented in Table 17. Where stills were available at 20 second intervals six whole tows were analysed for each broad habitat type. Several video tows also included mosaics of more than one broad habitat type. The occasional presence of a habitat in a video sample, but not an associated still, may be indicative that the video alone was not of sufficient quality to assess the habitat.

More detailed habitat names, akin to a biotope name describing the substrate and dominant taxa, were also assigned to each sample for the purposes of Marine Recorder data entry. In total, 53 individual habitat names were assigned to FSC seabed transects (Table 18), although some of these may reflect two different surveyors' opinion of the same habitat (although where possible any examples have been combined in QC).

Areas with two or more biotopes mixed together, interspersed or regularly repeating, such as with waves of coarse and then fine sediments, were defined as being a mosaic of all contributing habitats/biotopes.

Low quality stony reef (assessed using physical structure and associated community) was clast supported poorly sorted reef that comprised greater than 10% cobbles or boulders, not greatly elevated from the seafloor and with a mix of infauna and epifaunal life, as described by Irving 2009. These were not deemed of high enough quality, due to sparse distribution, small areas and few assicated epifaunal species, to be considered an Annex 1 "reef" feature.

Bathyal, or deep-sea, sand fields were present in five FSC_B tows, in keeping with observations of barchan sand dune fields and sandy contourite deposits as described in previous Strategic Environmental Assessments of the area (SEA4, Bett, 2003).

Representative images for each tow together with further detail on characterising and dominant species found within each FSC habitat are provided in Appendix 4.

Table 17. Broad habitat types observed in 2012 Faroe-Shetland Sponge Belt seabed imagery and the number of tows, video and stills samples each was assigned to. Where stills were available, six whole tows were analysed at 20 second intervals for each broad habitat type.

Habitat Type	Typical image	No of tows	Still samples	Video samples	Tows analysed @ 20s intervals
Potential Annex 1 Reef		0	0 (indicating that the video was of too poor quality to assess properly)	3	0
Low Quality Reef		9	79	2	1
Bathyal Mixed Substrates		29	994	22	6
Bathyal Sand		5	106	5	5

Habitat Type	Typical image	No of tows	Still samples	Video samples	Tows analysed @ 20s intervals
Bathyal mud with sponge		1	61	1	1
Bathyal Mosaics	n/a	6	5	6	n/a

Table 18. A breakdown of detailed habitat names assigned seabed imagery tow on the Faroe-Shetland Sponge Belt Scottish Nature Conservation MPA Proposal, 2012.

Broad Habitat type	Detailed Habitat Name	No of samples in habitat:	
Potential Annex 1 Reef	Bathyal Potential Annex 1 stony reef with Echinoderms	No of stills	1
		No of video habitats	0
Potential Annex 1 Reef	Bathyal Potential Annex 1 stony reef with Echinoderms & Porifera	No of stills	1
		No of video habitats	0
Potential Annex 1 Reef	Bathyal Potential Annex 1 stony reef with Porifera	No of stills	1
		No of video habitats	0
Low Quality Reef	Bathyal Low Quality stony reef with Echinoderms	No of stills	32
		No of video habitats	2
Low Quality Reef	Bathyal Low Quality stony reef with Porifera	No of stills	33
		No of video habitats	
Low Quality Reef	Bathyal Low Quality stony reef with Serpulids & encrusting sponge	No of stills	4
		No of video habitats	0
Low Quality Reef	Bathyal Low Quality stony reef with very sparse epifauna	No of stills	10
		No of video habitats	0
Bathyal Mixed Substrates	Bathyal coarse mixed sediment	No of stills	14
		No of video habitats	0
Bathyal Mixed Substrates	Bathyal coarse mixed sediments with cobbles	No of stills	4
		No of video habitats	0
Bathyal Mixed Substrates	Bathyal coarse mixed sediments with cobbles and Phakellia like sponge aggregations	No of stills	
		No of video habitats	3
Bathyal Mixed Substrates	Bathyal coarse mixed sediments with sparse cobbles and Porifera	No of stills	1
		No of video habitats	2
Bathyal Mixed Substrates	Bathyal coarse mixed substrates dominated by sand	No of stills	2

Broad Habitat type	Detailed Habitat Name	No of samples in habitat:	
		No of video habitats	0
Bathyal Mixed Substrates	Bathyal coarse mixed substrates dominated by sand with rare cobbles	No of stills	1
		No of video habitats	
Bathyal Mixed Substrates	Bathyal coarse mixed substrates dominated by sand with rare cobbles and echinoids	No of stills	2
		No of video habitats	0
Bathyal Mixed Substrates	Bathyal coarse sediments	No of stills	28
		No of video habitats	
Bathyal Mixed Substrates	Bathyal coarse sediments dominated by sand and gravels	No of stills	2
		No of video habitats	0
Bathyal Mixed Substrates	Bathyal mixed sediment, sparse epifauna	No of stills	19
		No of video habitats	
Bathyal Mixed Substrates	Bathyal mixed sediment, very sparse epifauna	No of stills	12
		No of video habitats	1
Bathyal Mixed Substrates	Bathyal mixed substrates dominated by coarse sediments with cobbles	No of stills	1
		No of video habitats	0
Bathyal Mixed Substrates	Bathyal mixed substrates dominated by coarse sediments with echinoderms	No of stills	38
		No of video habitats	
Bathyal Mixed Substrates	Bathyal mixed substrates dominated by coarse sediments with Porifera	No of stills	128
		No of video habitats	6
Bathyal Mixed Substrates	Bathyal mixed substrates dominated by coarse sediments with Porifera	No of stills	4
		No of video habitats	0
Bathyal Mixed Substrates	Bathyal mixed substrates dominated by coarse sediments with Sparse epifauna	No of stills	244
		No of video habitats	2
Bathyal Mixed Substrates	Bathyal mixed substrates dominated by gravel and pebbles with Cnidaria	No of stills	1
		No of video habitats	0
Bathyal Mixed Substrates	Bathyal mixed substrates dominated by gravel and pebbles with echinoderms	No of stills	5
		No of video habitats	
Bathyal Mixed Substrates	Bathyal mixed substrates dominated by gravel and pebbles with Porifera	No of stills	85
		No of video habitats	0
Bathyal Mixed Substrates	Bathyal mixed substrates dominated by gravel and pebbles with Porifera	No of stills	1
		No of video habitats	0
Bathyal Mixed Substrates	Bathyal mixed substrates dominated by gravel and pebbles with Porifera and Echinoderms	No of stills	3
		No of video habitats	0
Bathyal Mixed Substrates	Bathyal mixed substrates dominated by gravel and pebbles with Sparse Epifauna	No of stills	1
		No of video habitats	0
Bathyal Mixed Substrates	Bathyal mixed substrates dominated by gravel and pebbles with very sparse epifauna	No of stills	42
		No of video habitats	2
Bathyal Mixed Substrates	Bathyal mixed substrates dominated by sand and gravel	No of stills	32

Broad Habitat type	Detailed Habitat Name	No of samples in habitat:	
		No of video habitats	0
Bathyal Mixed Substrates	Bathyal mixed substrates dominated by sand and gravel with sparse epifauna	No of stills	26
		No of video habitats	0
Bathyal Mixed Substrates	Bathyal mixed substrates dominated by sand and gravel with very sparse epifauna	No of stills	101
		No of video habitats	2
Bathyal Mixed Substrates	Bathyal mixed substrates dominated by sand and pebbles	No of stills	1
		No of video habitats	0
Bathyal Mixed Substrates	Bathyal mixed substrates dominated by sand and pebbles with echinoids	No of stills	2
		No of video habitats	0
Bathyal Mixed Substrates	Bathyal mixed substrates dominated by sand with no evidence of epifauna	No of stills	3
		No of video habitats	0
Bathyal Mixed Substrates	Bathyal mixed substrates dominated by sand with rare cobbles	No of stills	18
		No of video habitats	0
Bathyal Mixed Substrates	Bathyal mixed substrates dominated by sand with rare cobbles and echinoids	No of stills	1
		No of video habitats	0
Bathyal Mixed Substrates	Bathyal mixed substrates dominated by sand with rare cobbles, echinoids and Porifera	No of stills	2
		No of video habitats	0
Bathyal Mixed Substrates	Bathyal mixed substrates dominated by sand with sparse epifauna	No of stills	74
		No of video habitats	0
Bathyal Mixed Substrates	Bathyal mixed substrates dominated by sand with very sparse epifauna	No of stills	91
		No of video habitats	2
Bathyal Mixed Substrates	Bathyal muddy gravel with Porifera	No of stills	1
		No of video habitats	0
Bathyal Mixed Substrates	Bathyal muddy substrates with gravel and pebbles and very sparse epifauna	No of stills	2
		No of video habitats	0
Bathyal Mixed Substrates	Bathyal sand and gravels with cobbles and pebbles	No of stills	0
		No of video habitats	1
Bathyal Mixed Substrates	Bathyal sand and pebbles	No of stills	1
		No of video habitats	0
Bathyal Mixed Substrates	Bathyal sandy coarse sediment with cobbles and sparse sponge	No of stills	0
		No of video habitats	1
Bathyal Mixed Substrates	Bathyal sparse cobble reef on coarse sediments	No of stills	1
		No of video habitats	0
Bathyal Sand	Bathyal rippled sand	No of stills	16
		No of video habitats	2
Bathyal Sand	Bathyal rippled sand with no fauna	No of stills	1
		No of video habitats	0
Bathyal Sand	Bathyal rippled sand with very sparse epifauna	No of stills	89
		No of video habitats	2
Bathyal Sand	Bathyal sand with sparse epifauna	No of stills	1
		No of video habitats	0
Bathyal mud with sponge	Bathyal gravelly mud with Porifera	No of stills	53

Broad Habitat type	Detailed Habitat Name	No of samples in habitat:	
		No of video habitats	0
Bathyal mud with sponge	Bathyal sandy mud with Porifera	No of stills	8
		No of video habitats	1
Bathyal Mosaics	Mosaic of bathyal coarse sandy gravel and cobble reef with sponge	No of stills	0
		No of video habitats	2
Bathyal Mosaics	Mosaic of Bathyal mixed substrates and low quality stony reef	No of stills	0
		No of video habitats	2
Bathyal Mosaics	Mosaic of Bathyal sand and low quality stony reef	No of stills	5
		No of video habitats	0
Bathyal Mosaics	Mosaic of bathyal sand and low quality stony reef with Porifera	No of stills	0
		No of video habitats	1
Bathyal Mosaics	Mosaic of Bathyal sand and mixed substrates	No of stills	0
		No of video habitats	1
	Total Count of Still		1249
	Total No of video habitats		35

3.2.4 Annex 1 Features present

Only three video samples (FSC_15, 16 & 18) were classed as potential Annex 1 stony reef from video tows alone. However, no stills within these tows were classified as Annex 1 reef, possibly indicating that the video was of too low quality to confidently assign this feature. All stills images within these tows were designated as low quality reef, following definitions provided by Irving (2009).

3.2.5 Scottish Marine Protected Area Search Features present

Two Scottish MPA search features were identified in the FSC 2012 seabed imagery (Table 21):

- **Blue Ling (*Molva dypterygia*)**, present in seven video habitats and 13 stills images (present at FSC1, 3, 4, 5, 8, 10, 12, 13, B4 and B5), and
- **Deep-sea sponge aggregations** definitely present in six video habitats and 67 stills images all in the FSC_B region, in transects at FSC_B5, B6, B7, B8, B9, B10 & B11. Deep sea sponge aggregations were allocated where large Demospongiae exceeded densities of 0.5n.m^{-2}, following the OSPAR definition (OSPAR Commission 2010).

Sparse and potential deep-sea sponge aggregations were also present in a further five transects (FSC 15, 16, 18, B6, & B12) and 121 images.

Figure 13 shows locations of these features observed on video tows alone (not including stills which are too small and numerous to be for mapped at this scale).

Table 19. Scottish MPA search features assigned to FSC imagery and the number of tows, video and stills samples each was assigned to, together with a typical image of each.

Scottish MPA Search Feature Present	Video Tow (event)	Sample Ref	Method	Position start / point	Position End	Depth (m bsl)
Deep sea sponge aggregations	FSC_B10	20121106_FSC_B10_VHab1	Towed Video	61.20565 -1.91215	61.2071 - 1.91205	497
	FSC_B10	20121106_FSC_B10_VHab2	Towed Video	61.2086 - 1.912466	61.21075 -1.911883	508
	FSC_B10	FSC_B10_2976_IMG	Photographic stills	61.20843 -1.91248		511
	FSC_B10	FSC_B10_2977_IMG	Photographic stills	61.20631 -1.91194		511
	FSC_B10	FSC_B10_2978_IMG	Photographic stills	61.20862 -1.91244		511
	FSC_B10	FSC_B10_2979_IMG	Photographic stills	61.20867 -1.9124		511
	FSC_B10	FSC_B10_2980_IMG	Photographic stills	61.20874 -1.91232		511
	FSC_B10	FSC_B10_2981_IMG	Photographic stills	61.20883 -1.91223		511
	FSC_B10	FSC_B10_2982_IMG	Photographic stills	61.20895 -1.91219		511
	FSC_B10	FSC_B10_2983_IMG	Photographic stills	61.20909 -1.91225		511
	FSC_B10	FSC_B10_2984_IMG	Photographic stills	61.20937 -1.91218		511
	FSC_B10	FSC_B10_2985_IMG	Photographic stills	61.20935 -1.9122		511
	FSC_B10	FSC_B10_2986_IMG	Photographic stills	61.20958 -1.91217		511
	FSC_B10	FSC_B10_2987_IMG	Photographic stills	61.20962 -1.91216		511
	FSC_B10	FSC_B10_2988_IMG	Photographic stills	61.20969 -1.91216		511
	FSC_B10	FSC_B10_2989_IMG	Photographic stills	61.20986 -1.91216		511
	FSC_B10	FSC_B10_2990_IMG	Photographic stills	61.20997 -1.91221		511
	FSC_B10	FSC_B10_2991_IMG	Photographic stills	61.21007 -1.91224		511
	FSC_B10	FSC_B10_2992_IMG	Photographic stills	61.21016 -1.91221		511
	FSC_B10	FSC_B10_2993_IMG	Photographic stills	61.21024 -1.91217		511
	FSC_B10	FSC_B10_2994_IMG	Photographic stills	61.2104 - 1.91208		511
	FSC_B10	FSC_B10_2995_IMG	Photographic stills	61.21047 -1.912		511
	FSC_B10	FSC_B10_2996_IMG	Photographic stills	61.21055 -1.91193		511
	FSC_B10	FSC_B10_2997_IMG	Photographic stills	61.21063 -1.91186		511
	FSC_B11	2020121107_FSC_B11_VHab1	Towed Video	61.2628 - 1.802383	61.271983 -1.802533	499
	FSC_B11	FSC_B11_IMG_3003	Photographic stills	61.269494 -1.802575		499

Scottish MPA Search Feature Present	Video Tow (event)	Sample Ref	Method	Position start / point	Position End	Depth (m bsl)
Deep sea sponge aggregations	FSC_B5	20121106_FSC_B5_VHab 1	Towed Video	60.6209 -3.39485	60.612733 -3.3917	470
	FSC_B5	FSC_B5_IMG_2622	Photographic stills	60.620545 -3.394737		469
	FSC_B5	FSC_B5_IMG_2633	Photographic stills	60.619242 -3.393955		466
	FSC_B5	FSC_B5_IMG_2635	Photographic stills	60.618988 -3.393834		466
	FSC_B5	FSC_B5_IMG_2639	Photographic stills	60.618610 -3.393561		465
	FSC_B5	FSC_B5_IMG_2640	Photographic stills	60.618424 -3.393398		464
	FSC_B5	FSC_B5_IMG_2641	Photographic stills	60.618202 -3.393182		464
	FSC_B5	FSC_B5_IMG_2649	Photographic stills	60.617522 -3.392541		463
	FSC_B5	FSC_B5_IMG_2651	Photographic stills	60.617348 -3.392344		464
	FSC_B5	FSC_B5_IMG_2654	Photographic stills	60.617124 -3.392137		464
	FSC_B5	FSC_B5_IMG_2664	Photographic stills	60.615925 -3.391640		462
	FSC_B5	FSC_B5_IMG_2667	Photographic stills	60.615447 -3.391682		461
	FSC_B5	FSC_B5_IMG_2668	Photographic stills	60.615315 -3.391660		460
	FSC_B5	FSC_B5_IMG_2675	Photographic stills	60.614255 -3.391815		458
	FSC_B5	FSC_B5_IMG_2676	Photographic stills	60.614133 -3.391774		458
	FSC_B5	FSC_B5_IMG_2677	Photographic stills	60.613974 -3.391798		458
	FSC_B5	FSC_B5_IMG_2678	Photographic stills	60.613824 -3.391766		458
	FSC_B5	FSC_B5_IMG_2679	Photographic stills	60.613647 -3.391765		457

Scottish MPA Search Feature Present	Video Tow (event)	Sample Ref	Method	Position start / point	Position End	Depth (m bsl)
Deep sea sponge aggregations	FSC_B6	FSCB6_IMG_2699	Photographic stills	60.673346 -3.354263		499
	FSC_B6	FSCB6_IMG_2709	Photographic stills	60.673216 -3.354237		497
	FSC_B7	20121106_FSC_B7_VHab 1	Towed Video	60.881466 -2.84545	60.871516 -2.844366	495
	FSC_B7	FSC_B7_2766_IMG	Photographic stills	60.881071 -2.845515		495
	FSC_B7	FSC_B7_2768_IMG	Photographic stills	60.880786 -2.845561		495
	FSC_B7	FSC_B7_IMG_2803	Photographic stills	60.875276 -2.844451		489
	FSC_B7	FSC_B7_IMG_2813	Photographic stills	60.873349 -2.844244		486
	FSC_B7	FSC_B7_IMG_2821	Photographic stills	60.871745 -2.844334		484
	FSC_B8	20121106_FSC_B8_VHab 1	Towed Video	60.9484 - 2.6934	60.939766 -2.701916	497
	FSC_B8	FSC_B8_2824_IMG	Photographic stills	60.93177 -2.69342		503
	FSC_B8	FSC_B8_2829_IMG	Photographic stills	60.93249 -2.69434		503
	FSC_B8	FSC_B8_2831_IMG	Photographic stills	60.93279 -2.69471		503
	FSC_B8	FSC_B8_2835_IMG	Photographic stills	60.93322 -2.69509		503
	FSC_B8	FSC_B8_2839_IMG	Photographic stills	60.93357 -2.69552		503
	FSC_B8	FSC_B8_2842_IMG	Photographic stills	60.93385 -2.69581		503
	FSC_B8	FSC_B8_2846_IMG	Photographic stills	60.93423 -2.69621		503
	FSC_B8	FSC_B8_2848_IMG	Photographic stills	60.93438 -2.69636		503
	FSC_B8	FSC_B8_2850_IMG	Photographic stills	60.93459 -2.69656		503
	FSC_B8	FSC_B8_2854_IMG	Photographic stills	60.93493 -2.69693		503
	FSC_B8	FSC_B8_2858_IMG	Photographic stills	60.93537 -2.69737		503
	FSC_B8	FSC_B8_2860_IMG	Photographic stills	60.93552 -2.69757		503
	FSC_B8	FSC_B8_2865_IMG	Photographic stills	60.93616 -2.69841		503
	FSC_B8	FSC_B8_2872_IMG	Photographic stills	60.93711 -2.69961		503

Scottish MPA Search Feature Present	Video Tow (event)	Sample Ref	Method	Position start / point	Position End	Depth (m bsl)
Deep sea sponge aggregations	FSC_B8	FSC_B8_2879_IMG	Photographic stills	60.93797 -2.70039		503
	FSC_B8	FSC_B8_2883_IMG	Photographic stills	60.9383 - 2.70066		503
	FSC_B8	FSC_B8_2890_IMG	Photographic stills	60.93916 -2.7014		503
	FSC_B9	FSC_B09_2957_IMG	Photographic stills	61.1216 - 2.22674		565
	FSC_B9	FSC_B09_2961_IMG	Photographic stills	61.1222 - 2.2268		567
	FSC_B9	FSC_B09_2963_IMG	Photographic stills	61.12256 -2.22699		567
Potential deep sea sponge aggregations	FSC_B12	2020121107_FSC_B12_VHab1	Towed Video	61.291366 -1.683666	60.30015 -1.68905	463
	FSC_B12	FSC_B12_IMG_3075	Photographic stills	61.292439 -1.684503		466
	FSC_B12	FSC_B12_IMG_3078	Photographic stills	61.292711 -1.684708		466
	FSC_B12	FSC_B12_IMG_3081	Photographic stills	61.292976 -1.684856		467
	FSC_B12	FSC_B12_IMG_3083	Photographic stills	61.293167 -1.684961		467
	FSC_B12	FSC_B12_IMG_3085	Photographic stills	61.293371 -1.685133		468
	FSC_B12	FSC_B12_IMG_3087	Photographic stills	61.293548 -1.685227		469
	FSC_B12	FSC_B12_IMG_3097	Photographic stills	61.294544 -1.686078		472
	FSC_B12	FSC_B12_IMG_3101	Photographic stills	61.295045 -1.686546		474
	FSC_B12	FSC_B12_IMG_3104	Photographic stills	61.295421 -1.686817		473
	FSC_B12	FSC_B12_IMG_3105	Photographic stills	61.295553 -1.686964		473
	FSC_B12	FSC_B12_IMG_3109	Photographic stills	61.296096 -1.687336		473
	FSC_B12	FSC_B12_IMG_3110	Photographic stills	61.296196 -1.687424		473
	FSC_B12	FSC_B12_IMG_3111	Photographic stills	61.296284 -1.687482		474

Scottish MPA Search Feature Present	Video Tow (event)	Sample Ref	Method	Position start / point	Position End	Depth (m bsl)
Potential deep sea sponge aggregations	FSC_B12	FSC_B12_IMG_3114	Photographic stills	61.296713 -1.687718		474
	FSC_B12	FSC_B12_IMG_3116	Photographic stills	61.296939 -1.687784		474
	FSC_B12	FSC_B12_IMG_3119	Photographic stills	61.297454 -1.687986		476
	FSC_B12	FSC_B12_IMG_3120	Photographic stills	61.297645 -1.688116		475
	FSC_B12	FSC_B12_IMG_3130	Photographic stills	61.298739 -1.688625		478
	FSC_B6	20121106_FSC_B6_VHab1	Towed Video	60.6748 - 3.35455	60.665566 -3.352883	500
	FSC_B7	FSC_B7_IMG_2764	Photographic stills	60.881452 -2.845472		495
	FSC_B7	FSC_B7_IMG_2774	Photographic stills	60.879905 -2.845560		495
	FSC_B7	FSC_B7_IMG_2783	Photographic stills	60.878502 -2.845483		493
	FSC18	FSC18_IMG_2345	Photographic stills	60.27968 -4.34717		469
	FSC18	FSC18_IMG_2348	Photographic stills	60.27998 -4.34874		471
	FSC18	FSC18_IMG_2352	Photographic stills	60.28037 -4.35033		473
Sparse deep sea sponge aggregations	FSC_B11	FSC_B11_IMG_2999	Photographic stills	61.210695 -1.911835		499
	FSC_B11	FSC_B11_IMG_3001	Photographic stills	61.269140 -1.802544		499
	FSC_B11	FSC_B11_IMG_3002	Photographic stills	61.269258 -1.802554		499
	FSC_B11	FSC_B11_IMG_3004	Photographic stills	61.269612 -1.802585		499
	FSC_B11	FSC_B11_IMG_3005	Photographic stills	61.269730 -1.802596		499
	FSC_B11	FSC_B11_IMG_3006	Photographic stills	61.269848 -1.802606		499
	FSC_B11	FSC_B11_IMG_3008	Photographic stills	61.270202 -1.802637		499

Scottish MPA Search Feature Present	Video Tow (event)	Sample Ref	Method	Position start / point	Position End	Depth (m bsl)
Sparse deep sea sponge aggregations	FSC_B11	FSC_B11_IMG_3009	Photographic stills	61.270320 -1.802648		499
	FSC_B11	FSC_B11_IMG_3010	Photographic stills	61.270438 -1.802658		499
	FSC_B11	FSC_B11_IMG_3011	Photographic stills	61.270556 -1.802669		499
	FSC_B11	FSC_B11_IMG_3012	Photographic stills	61.270674 -1.802679		499
	FSC_B11	FSC_B11_IMG_3013	Photographic stills	61.264172 -1.801849		499
	FSC_B11	FSC_B11_IMG_3014	Photographic stills	61.264419 -1.801963		499
	FSC_B11	FSC_B11_IMG_3015	Photographic stills	61.271028 -1.802710		499
	FSC_B11	FSC_B11_IMG_3016	Photographic stills	61.264933 -1.802255		499
	FSC_B11	FSC_B11_IMG_3017	Photographic stills	61.271264 -1.802731		499
	FSC_B11	FSC_B11_IMG_3018	Photographic stills	61.271382 -1.802741		499
	FSC_B11	FSC_B11_IMG_3019	Photographic stills	61.271500 -1.802752		499
	FSC_B11	FSC_B11_IMG_3020	Photographic stills	61.271618 -1.802762		499
	FSC_B11	FSC_B11_IMG_3022	Photographic stills	61.271854 -1.802783		499
	FSC_B11	FSC_B11_IMG_3023	Photographic stills	61.268786 -1.802512		499
	FSC_B11	FSC_B11_IMG_3024	Photographic stills	61.266027 -1.802482		499
	FSC_B11	FSC_B11_IMG_3025	Photographic stills	61.266098 -1.802511		499
	FSC_B11	FSC_B11_IMG_3026	Photographic stills	61.266230 -1.802521		499
	FSC_B11	FSC_B11_IMG_3027	Photographic stills	61.266359 -1.802537		499

Scottish MPA Search Feature Present	Video Tow (event)	Sample Ref	Method	Position start / point	Position End	Depth (m bsl)
Sparse deep sea sponge aggregations	FSC_B11	FSC_B11_IMG_3028	Photographic stills	61.266573 -1.802597		499
	FSC_B11	FSC_B11_IMG_3029	Photographic stills	61.266669 -1.802574		499
	FSC_B11	FSC_B11_IMG_3030	Photographic stills	61.266870 -1.802516		499
	FSC_B11	FSC_B11_IMG_3031	Photographic stills	61.267235 -1.802356		499
	FSC_B11	FSC_B11_IMG_3033	Photographic stills	61.267367 -1.802206		499
	FSC_B11	FSC_B11_IMG_3034	Photographic stills	61.267458 -1.802132		499
	FSC_B11	FSC_B11_IMG_3035	Photographic stills	61.267614 -1.801948		499
	FSC_B11	FSC_B11_IMG_3036	Photographic stills	61.267717 -1.801875		499
	FSC_B11	FSC_B11_IMG_3039	Photographic stills	61.268010 -1.801812		499
	FSC_B11	FSC_B11_IMG_3040	Photographic stills	61.26819 -1.801816		499
	FSC_B11	FSC_B11_IMG_3041	Photographic stills	61.268286 -1.801789		499
	FSC_B11	FSC_B11_IMG_3042	Photographic stills	61.268404 -1.801770		499
	FSC_B11	FSC_B11_IMG_3044	Photographic stills	61.268643 -1.801772		499
	FSC_B11	FSC_B11_IMG_3045	Photographic stills	61.268697 -1.801774		499
	FSC_B11	FSC_B11_IMG_3048	Photographic stills	61.269059 -1.801796		499
	FSC_B11	FSC_B11_IMG_3049	Photographic stills	61.269181 -1.801781		499
	FSC_B11	FSC_B11_IMG_3051	Photographic stills	61.269403 -1.801832		499
	FSC_B11	FSC_B11_IMG_3052	Photographic stills	61.269821 -1.801925		499

Scottish MPA Search Feature Present	Video Tow (event)	Sample Ref	Method	Position start / point	Position End	Depth (m bsl)
Sparse deep sea sponge aggregations	FSC_B11	FSC_B11_IMG_3053	Photographic stills	61.270011 -1.801993		499
	FSC_B11	FSC_B11_IMG_3054	Photographic stills	61.270115 -1.802027		499
	FSC_B11	FSC_B11_IMG_3055	Photographic stills	61.270206 -1.802059		499
	FSC_B11	FSC_B11_IMG_3060	Photographic stills	61.270927 -1.802239		499
	FSC_B11	FSC_B11_IMG_3064	Photographic stills	61.271569 -1.802390		499
	FSC_B11	FSC_B11_IMG_3065	Photographic stills	61.271632 -1.802421		499
	FSC_B11	FSC_B11_IMG_3066	Photographic stills	61.271772 -1.802467		499
	FSC_B9	FSC_B09_2897_IMG	Photographic stills	61.11356 -2.22071		547
	FSC_B9	FSC_B09_2901_IMG	Photographic stills	61.11408 -2.22128		549
	FSC_B9	FSC_B09_2902_IMG	Photographic stills	61.11421 -2.22136		550
	FSC_B9	FSC_B09_2903_IMG	Photographic stills	61.11432 -2.22146		549
	FSC_B9	FSC_B09_2906_IMG	Photographic stills	61.11474 -2.22199		550
	FSC_B9	FSC_B09_2907_IMG	Photographic stills	61.11495 -2.22236		550
	FSC_B9	FSC_B09_2908_IMG	Photographic stills	61.11505 -2.22247		551
	FSC_B9	FSC_B09_2909_IMG	Photographic stills	61.11528 -2.22256		551
	FSC_B9	FSC_B09_2910_IMG	Photographic stills	61.11534 -2.2225		552
	FSC_B9	FSC_B09_2911_IMG	Photographic stills	61.1154 - 2.22243		552
	FSC_B9	FSC_B09_2912_IMG	Photographic stills	61.11549 -2.22246		552
	FSC_B9	FSC_B09_2913_IMG	Photographic stills	61.11577 -2.22287		553
	FSC_B9	FSC_B09_2914_IMG	Photographic stills	61.11587 -2.22298		553
	FSC_B9	FSC_B09_2915_IMG	Photographic stills	61.11603 -2.22309		553
	FSC_B9	FSC_B09_2916_IMG	Photographic stills	61.11623 -2.22311		553
	FSC_B9	FSC_B09_2917_IMG	Photographic stills	61.1163 - 2.2231		554
	FSC_B9	FSC_B09_2918_IMG	Photographic stills	61.11643 -2.2231		554

Scottish MPA Search Feature Present	Video Tow (event)	Sample Ref	Method	Position start / point	Position End	Depth (m bsl)
Sparse deep sea sponge aggregations	FSC_B9	FSC_B09_2919_IMG	Photographic stills	61.11653 -2.22317		554
	FSC_B9	FSC_B09_2920_IMG	Photographic stills	61.11666 -2.2233		554
	FSC_B9	FSC_B09_2921_IMG	Photographic stills	61.11679 -2.22349		554
	FSC_B9	FSC_B09_2922_IMG	Photographic stills	61.11692 -2.22361		555
	FSC_B9	FSC_B09_2923_IMG	Photographic stills	61.11713 -2.22364		555
	FSC_B9	FSC_B09_2924_IMG	Photographic stills	61.11722 -2.22361		556
	FSC_B9	FSC_B09_2925_IMG	Photographic stills	61.11729 -2.22363		556
	FSC_B9	FSC_B09_2926_IMG	Photographic stills	61.11746 -2.22376		556
	FSC_B9	FSC_B09_2927_IMG	Photographic stills	61.11762 -2.22401		556
	FSC_B9	FSC_B09_2928_IMG	Photographic stills	61.11774 -2.22418		557
	FSC_B9	FSC_B09_2929_IMG	Photographic stills	61.11793 -2.22435		557
	FSC_B9	FSC_B09_2930_IMG	Photographic stills	61.11806 -2.22441		558
	FSC_B9	FSC_B09_2931_IMG	Photographic stills	61.11818 -2.22455		559
	FSC_B9	FSC_B09_2932_IMG	Photographic stills	61.11848 -2.22495		559
	FSC_B9	FSC_B09_2933_IMG	Photographic stills	61.11873 -2.22518		560
	FSC_B9	FSC_B09_2934_IMG	Photographic stills	61.11873 -2.22518		560
	FSC_B9	FSC_B09_2935_IMG	Photographic stills	61.11884 -2.22519		560
	FSC_B9	FSC_B09_2937_IMG	Photographic stills	61.11911 -2.22516		561
	FSC_B9	FSC_B09_2939_IMG	Photographic stills	61.11933 -2.22532		561
	FSC_B9	FSC_B09_2942_IMG	Photographic stills	61.11975 -2.22574		562
	FSC_B9	FSC_B09_2943_IMG	Photographic stills	61.11985 -2.22588		562
	FSC_B9	FSC_B09_2944_IMG	Photographic stills	61.11994 -2.22593		563
	FSC_B9	FSC_B09_2945_IMG	Photographic stills	61.12007 -2.22602		563
	FSC_B9	FSC_B09_2946_IMG	Photographic stills	61.1202 - 2.22601		564
	FSC15	20121105_FSC15_VHab1	Towed Video	60.152033 -4.6311	60.160133 -4.623666	436
	FSC15	FSC15_IMG_2203	Photographic stills	60.15274 -4.63047		438
	FSC15	FSC15_IMG_2214	Photographic stills	60.15603 -4.62982		444

Scottish MPA Search Feature Present	Video Tow (event)	Sample Ref	Method	Position start / point	Position End	Depth (m bsl)
Sparse deep sea sponge aggregations	FSC15	FSC15_IMG_2223	Photographic stills	60.15789 -4.62786		445
	FSC16	20121105_FSC16_VHab1	Towed Video	60.192883 -4.56125	60.200333 -4.571266	476
	FSC16	FSC16_IMG_2243	Photographic stills	60.19336 -4.56208		469
	FSC16	FSC16_IMG_2275	Photographic stills	60.19668 -4.56664		479
	FSC16	FSC16_IMG_2296	Photographic stills	60.20029 -4.57117		489
	FSC18	20121105_FSC18_VHab1	Towed Video	60.279166 -4.344983	60.283216 -4.361383	466
Blue Ling *Molva dypterygia*	FSC_B4	20121105_FSC_B4_V_Hab1	Towed Video	60.5484 - 3.504883	60.556866 -3.499316	432
	FSC_B4	FSCB4_IMG_2595.JPG	Photographic stills	60.554105 -3.501514		432
	FSC_B4	FSCB4_IMG_2607.JPG	Photographic stills	60.555528 -3.500102		434
	FSC_B5	FSC_B5_IMG_2659	Photographic stills	60.616650 -3.391760		466
	FSC01	20121102_FSC01_VHab1	Towed Video	59.794266 -5.827683	59.789833 -4.830116	538
	FSC01	FSC01 _IMG_0047	Photographic stills	59.786893 -5.829211		495
	FSC01	FSC01_IMG_0023	Photographic stills	59.791739 -5.829507		524
	FSC01	FSC01_IMG_0025	Photographic stills	59.791483 -5.829333		523
	FSC01	FSC01_IMG_0031	Photographic stills	59.790360 -5.830118		511
	FSC03	20121102_FSC03_VHab1	Towed Video	59.783266 -5.60615	59.790083 -5.596666	446
	FSC03	FSC03_IMG_1572_2	Photographic stills	59.784999 -5.604317		446
	FSC04	20121103_FSC04_VHab1	Towed Video	59.836033 -5.551683	59.84325 -5.53995	498
	FSC04	FSC04_IMG_1621	Photographic stills	59.839601 -5.547027		505
	FSC05	20121103_FSC05_VHab1	Towed Video	59.8756 - 5.481233	59.884 - 5.474116	519
	FSC08	FSC08_IMG_1866	Photographic stills	59.970130 -5.175458		487

Scottish MPA Search Feature Present	Video Tow (event)	Sample Ref	Method	Position start / point	Position End	Depth (m bsl)
Blue Ling *Molva dypterygia*	FSC10	20121105_FSC10_VHab1	Towed Video	59.9033 - 5.387766	59.8941 - 5.386133	509
	FSC10	FSC10_IMG_1987	Photographic stills	59.8993 - 5.38738		498
	FSC10	FSC10_IMG_1991	Photographic stills	59.89859 -5.38761		497
	FSC12	20121105_FSC12_VHab1	Towed Video	60.025483 -4.9551	60.020366 -4.95365	437
	FSC13	FSC13_IMG_2152	Photographic stills	60.10301 -4.85898		527

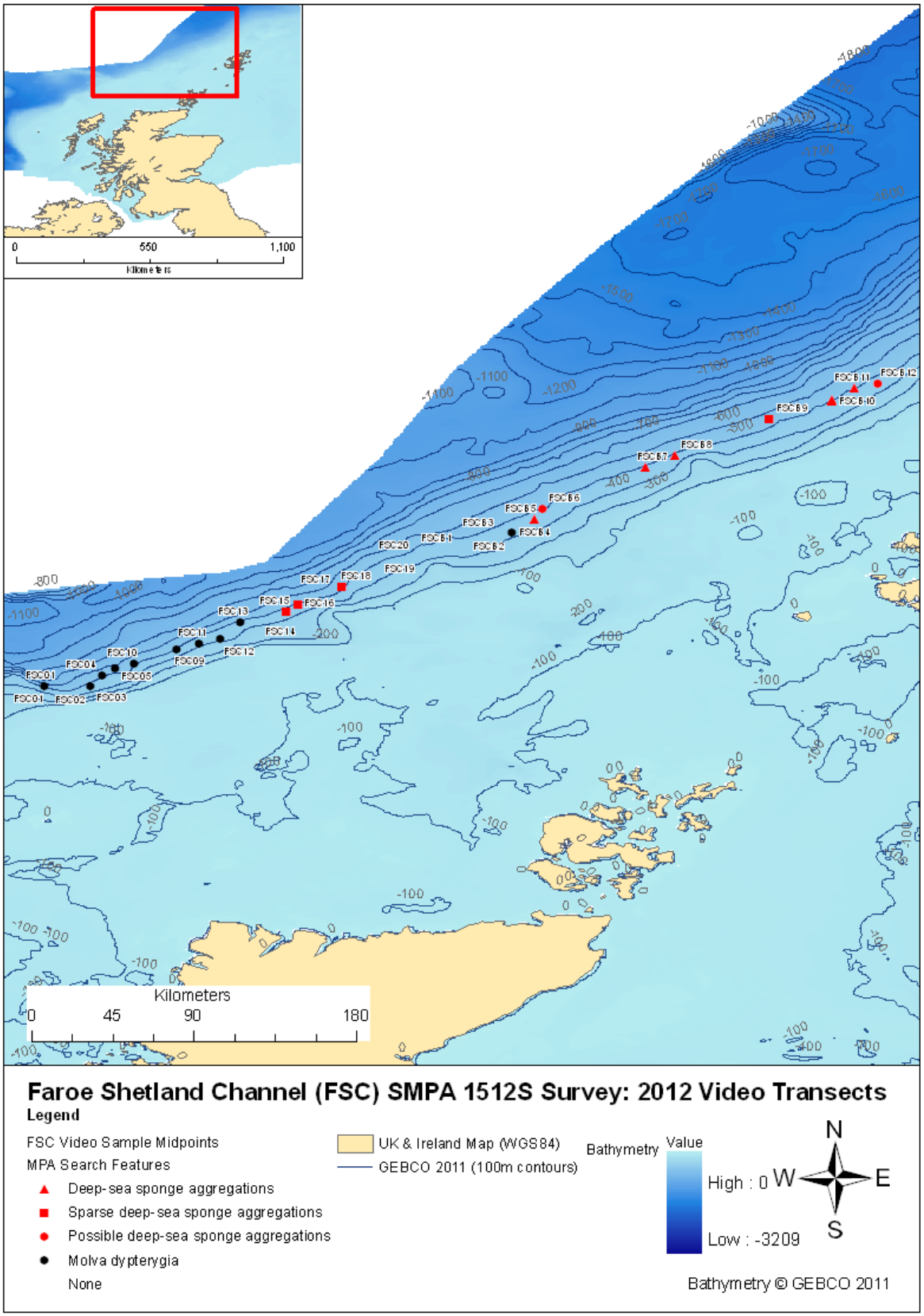


Figure 13. Locations of Marine Protected Area Search Features observed within the 2012 Faroe-Shetland Sponge Belt Scottish Nature Conservation MPA Proposal survey area (FSC Scottish Location Box), displaying data from whole video tows as individual video sample centre points (FSC Video Points). Photo samples (FSC Stills Points), taken at approximately 20 or 60 second intervals, were analysed from all stations however are not visible at the current map scale.

3.2.6 Other species of conservation interest identified

Other species of conservation interest included any species mentioned in the following lists: Scottish UK Species Conservation Importance and Priority Marine Features (Moore & Roberts, 2011), Scottish Biodiversity List, UK Biodiversity Action Plan priority species or habitats, UK Species of Conservation Importance, Nationally rare or scarce marine species (UK), IUCN Red List vulnerable species (URL[5]: The IUCN Red List) and any species protected by the OSPAR Convention (OSPAR Commission, 2008).

The following species of conservation interest were identified in the WTR 2012 seabed imagery in the Faroe-Shetland Sponge Belt area of search:

- **Fireworks Anemone** (*Pachycerianthus*), UK Biodiversity Action Plan priority species present in at least one still image on FSC_16 (Table 21).
- **Octocorallia** (soft corals), Scottish Biodiversity list, present in seven images in FSC_B9 (Table 21)
- **Torsk** (*Brosme brosme*), Scottish Biodiversity List, present in one photographic still and one video habitat sample, both in FSC_18 (Table 21)
- **Blue Ling** *(Molva dypterygia),* UK Biodiversity Action Plan priority species, present in 7 video habitats and 13 stills images (Pictured in Table 20, detailed in Table 19 above).

Locations of species of conservation interest in the FSC area over whole video tows (not in individual stills images) are provided in Figure 14.

Xenophyphores, although not formally designated as species of conservation interest, are known to form dense fields in the Faroe-Shetland Sponge Belt (Bett, 2003 & 2012, DTI, 2007). Hughes and Gooday (2004) concluded that these mounds, formed by the tests of xenophyphores, slightly increase the abundance of macro- and meiofauna in the immediate area. In the current surveys, these mounds were only found in low numbers, so are unlikely to have had the same effect as when observed in dense aggregations.

Figure 15. Xenophyphore, *Syringammina fragilissima,* mounds identified from stills images on FSC_B09.

The Xenophyphore *Syringammina fragilissima* (Figure 15) has been noted in isolated patches in low abundance in several stills images from FSC_B09 (images 2906, 2907, 2915, 2922, 2923, 2925, 2927). These have been entered into Marine Recorder as Common, with up to 3 mounds per image (1.6m^2), although under SEA7 guidance, this is not considered enough to be a 'dense field'.

Table 20. Examples of species of conservation interest identified in 2012 FSC seabed imagery.

Fireworks Anemone (*Pachycerianthus*), UK Biodiversity Action Plan priority species

Octocorallia
Scottish Biodiversity List

Blue Ling (*Molva dypterygia*)
UK Biodiversity Action Plan priority species
& Scottish MPA Search Feature

Torsk (*Brosme brosme*),
Scottish Biodiversity List

Table 21. Species of conservation interest identified in the 2012 FSC seabed imagery and the positions of each.

Species Blue Ling *(Molva dypterygia)*	**Conservation Interest** *UK Biodiversity Action Plan priority species*	**Video Tow (event)** *See Table 19 for detail*	**Sample Ref**	**Method**	**Position start / point**	**Position End**	**Depth (m bsl)**
Fireworks Anemone (*Pachycerianthus*)	UK Biodiversity Action Plan priority species	FSC16	FSC16_IMG_2240	Photographic Still	60.19323 -4.56184		469
Soft Corals (Octocorallia)	Scottish Biodiversity List	FSC_B9	FSC_B09_2908_IMG	Photographic Still	61.11505 -2.22247		551
		FSC_B9	FSC_B09_2909_IMG	Photographic Still	61.11528 -2.22256		551
		FSC_B9	FSC_B09_2918_IMG	Photographic Still	61.11643 -2.2231		554
		FSC_B9	FSC_B09_2920_IMG	Photographic Still	61.11666 -2.2233		554
		FSC_B9	FSC_B09_2926_IMG	Photographic Still	61.11746 -2.22376		556
		FSC_B9	FSC_B09_2927_IMG	Photographic Still	61.11762 -2.22401		556
		FSC_B9	FSC_B09_2934_IMG	Photographic Still	61.11873 -2.22518		560
Torsk (*Brosme brosme)*	Scottish Biodiversity List	FSC18	20121105_FSC18_VHab1	Towed Video	60.279166 -4.344983	60.283216 -4.361383	466
		FSC18	FSC18_IMG_2348	Photographic Still	60.27998 -4.34874		471

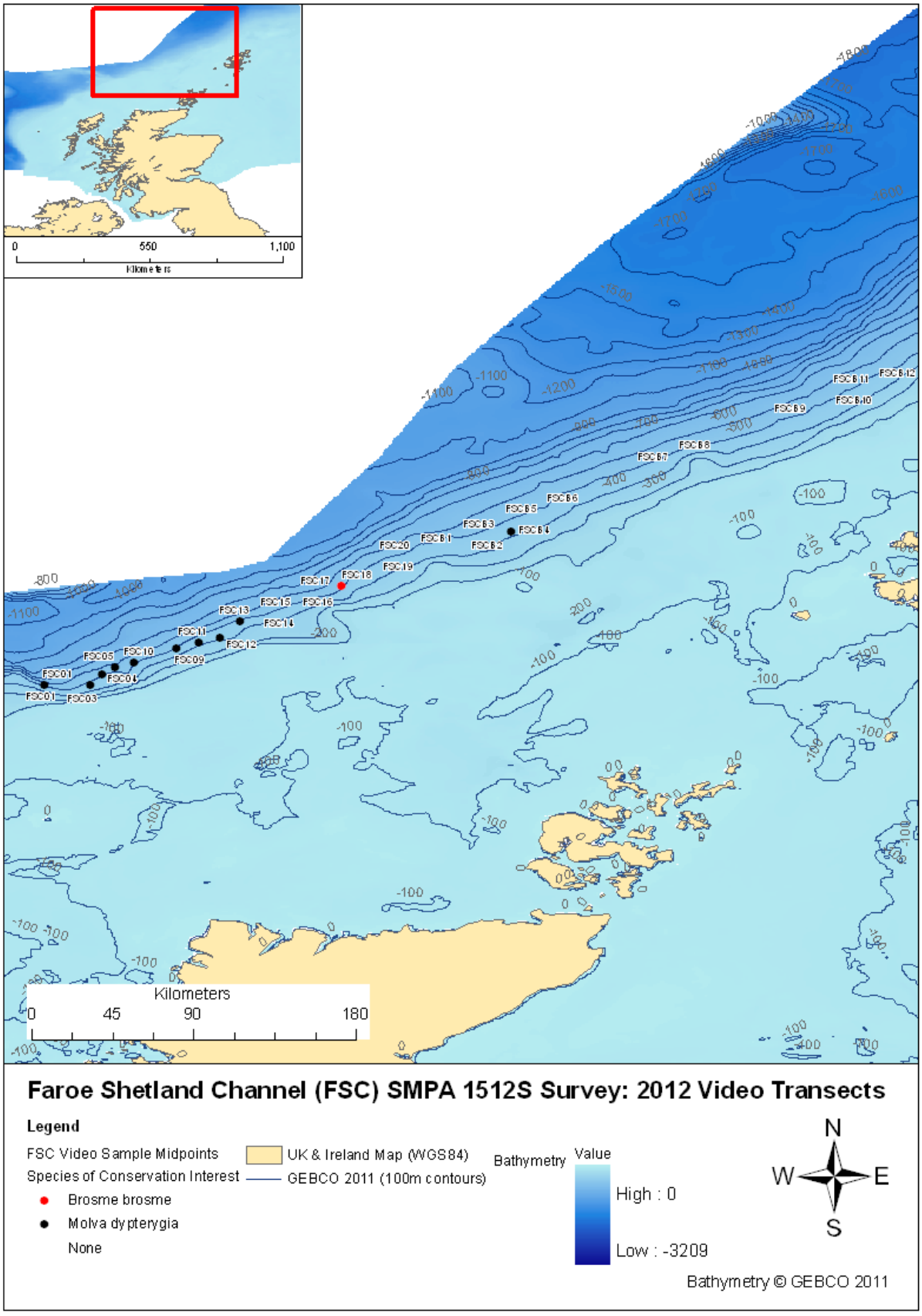


Figure 14. Locations of species of conservation importance identified in the 2012 FSC seabed imagery surveys, displaying data from whole video tows as individual video sample centre points (FSC Video Points). Photo samples (FSC Stills Points), taken at approximately 20 or 60 second intervals, were analysed from all stations however are not visible at the current map scale.

3.2.7 Taxon richness

The current report provides an introduction to the taxon richness found in the Faroe-Shetland Sponge Belt area, but more detailed analysis of this data is required before any solid conclusions can be drawn about taxon richness.

Taxon richness was calculated as all individual taxa, or 'species' as entered into Marine Recorder, including all species, individual morphotypes, groups of species or genera with qualifiers within a sample. In addition to recording all individual encrusting Porifera and Bryozoan taxa, surveyors were also asked to consistently record the overall abundance of 'all' Porifera and Bryozoa crusts (to ensure that their overall presence was recorded if individual taxon were not).

Taxon richness has been entered into Marine Recorder as number of taxa for each still image per 1.6m^2 (size of the still image) or for the video sample area. For the presentation of results the number of taxa has been standardised and is presented as the number of taxa per m^2, referred to herafter as taxa per m^2.

Overall, less than 2% of in the Faroe-Shetland Sponge Belt (FSC) proposed Scottish Nature Conservation MPA images analysed contained no taxon at all, 5% contained more than 10 taxa per m^2, whilst 95% contained less than 10 taxa per m^2. The maximum taxon richness observed in the FSC area in a single image was 28 taxa, or 17.5 taxa per m^2, at FSC_B7 (Figure 16). FSC_B was generally more taxa rich the main FSC survey area (Figure 16) and equally rich as the Wyville Thomson Ridge SCI (where 11% of stills showed taxon richness greater than 10 taxa per m^2). The most taxon rich still image in the FSC area (excluding the FSC_B area) contained 10.63 taxa per m^2. Particularly taxa rich camera tows were FSC_B6, 7, 8, 9 & 12, all of which had several images with more than 20 taxa in each (12.5 taxa per m^2). However, several images from video and stills in the original FSC survey area had no taxa at all associated with them (FSC 11, 12, 13, 14).

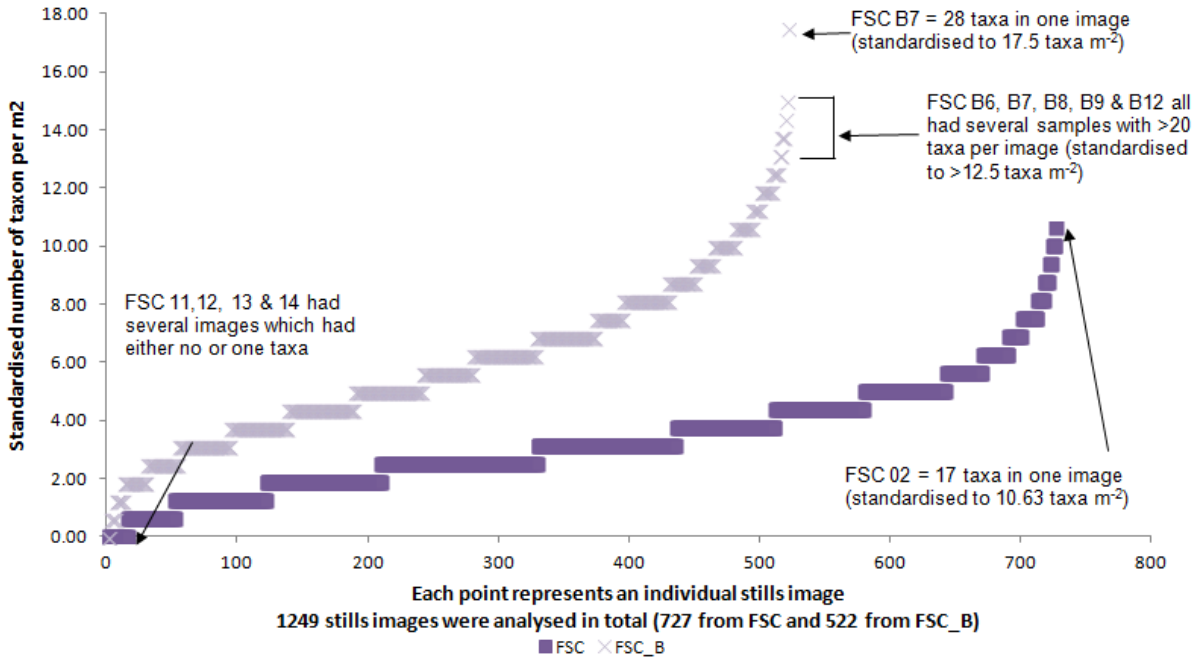


Figure 16. Taxon richness (standardised to taxa per m^2) assigned following seabed imagery analysis of the Faroe-Shetland Sponge Belt Scottish Nature Conservation MPA Proposal Area, 2012.

The taxon richness seemed to fluctuate over the survey area, but the pattern across tows was mimicked in taxon richness when assessed from both stills and video (Figure 17), showing a potential real increase in taxon richness over the survey area (Figure 18). Previous reports of the area state that deep sea sponge aggregations and heightened diversity are present in areas of iceberg plough mark zones and the edge of channels between 400-600m below sea level (Bett, 2003). Most surveys were in the correct depth range, and iceberg plough marks were suspected in FSC_B5, B6, B7 and B12, but were very hard to identify from poor video and small scale stills. Distribution of taxon rich habitats can be seen clustered in specific areas in Figure 18.

Figure 17 (together with Figure 8) confirms that video alone is not of high enough quality to soley assess taxon richness. However, unlike in the Wyville Thomson Ridge imagery, the number of taxon observed in videos was consistently higher in the FSC area than the average number of taxon recorded from stills images. Where the raw data was consulted for large differences in taxon richness between video and stills, there were again lmore large mobile species which were probably not being picked up by the stills imagery. However, despite the best efforts of quality assurance, taxon richness must not be over-analysed as differences in surveyor observations with such low numbers of taxa may account for apparent differences in taxon richness between tows. One example of this is that if one surveyor forgot to record 'total' Bryozoa and Porifera crusts (although they were recording individual identifyable crust taxon, just not the category of 'all' crusts), two tows may already have a difference in two taxa.Also, there are difficulties in standardising the number of taxon taken from a video tow as the areas covered by video ranged from 700 - 2,000m^2 where taxon richness was cumulative, compared to a 1.6m^2 survey area from stills images averaged across the tow .

The current report provides an introduction to the taxon richness found in the Faroe-Shetland Sponge Belt area, but more detailed analysis of this data is required before any solid conclusions can be drawn about taxon richness.

Appendix 4 provides an average species richness found per tow, calculated as an average number of species per image sampled.

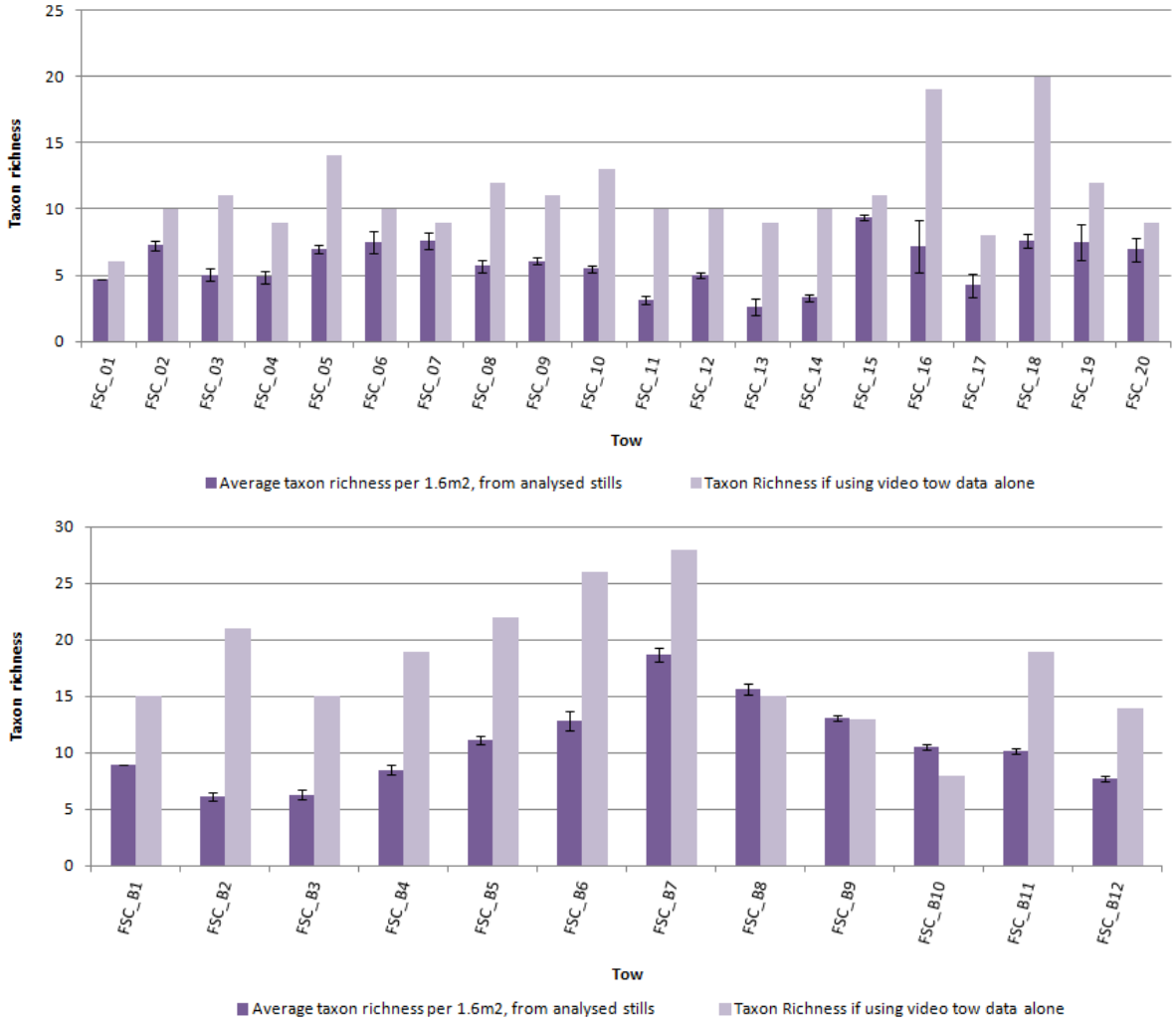


Figure 17. Taxon richness assigned following seabed imagery analysis of the Faroe-Shetland Sponge Belt Scottish Nature Conservation MPA Proposal Area, 2012. Dark purple bars represent the average richness per image over the transect, together with standard error bars. Light bars present the total number of taxa observed over the whole tow.

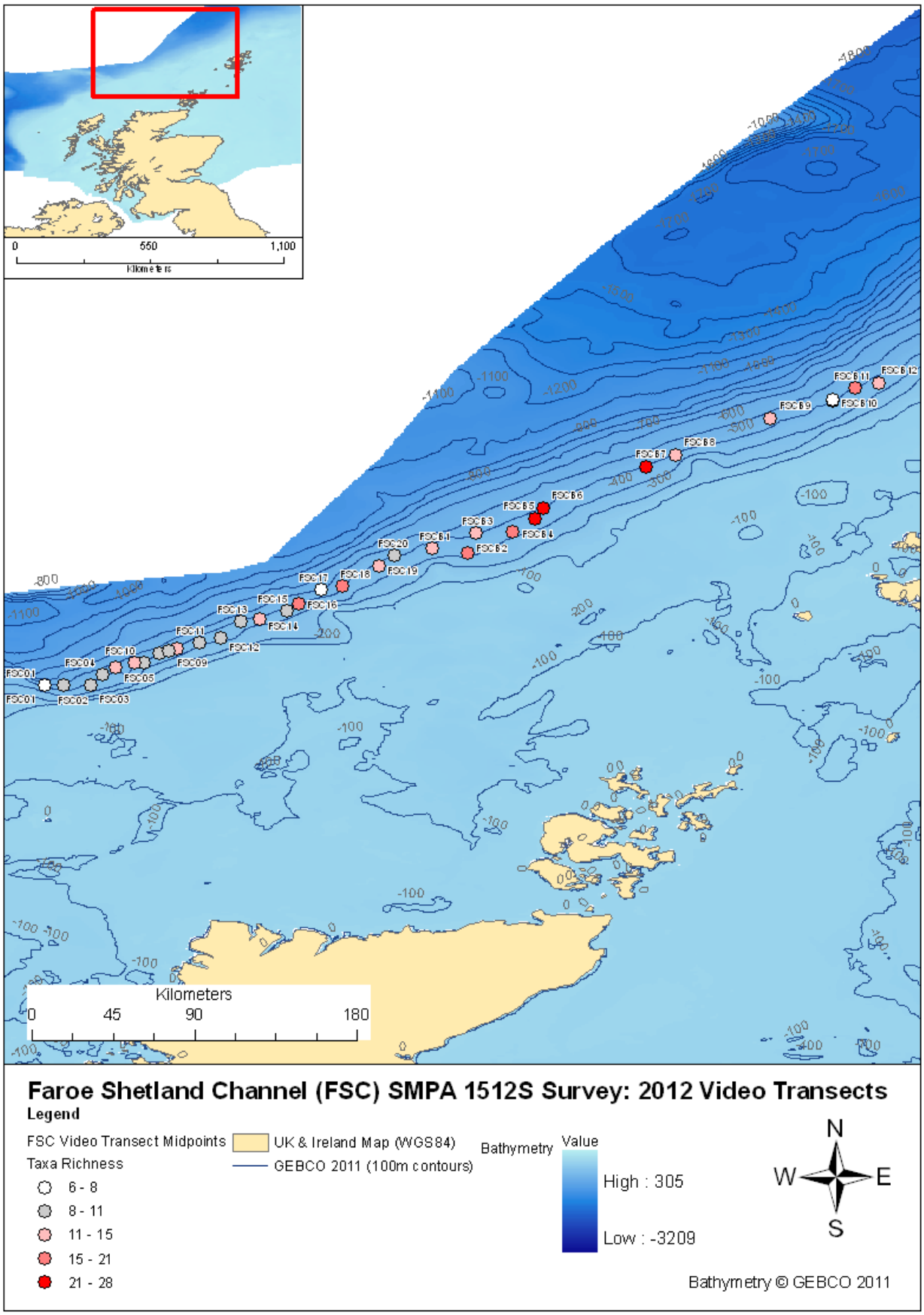


Figure 18. Distribution of taxon richness following seabed imagery analysis of the Faroe-Shetland Sponge Belt Scottish Nature Conservation MPA Proposal, 2012. Taxon richness from video samples alone is presented.

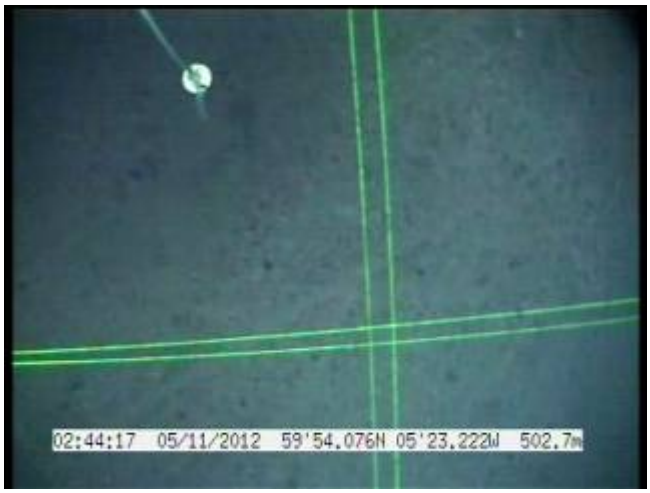
3.2.8 Evidence of trawling, disturbance and litter identified

In 2012, Bett wrote that *"two major industries operate on the deep-sea floor in the SEA4 area – the oil and gas industry and the fishing industry – both of these industries may be expected to exert some adverse impact on the ecology of the deep-sea benthos*".

In this survey, evidence of trawling and litter were observed as deep as 565m below sea level in the Faroe-Shetland Sponge Belt. Examples of possible evidence of trawling and litter observed on the Wyville Thomson Ridge are provided in Table 21.

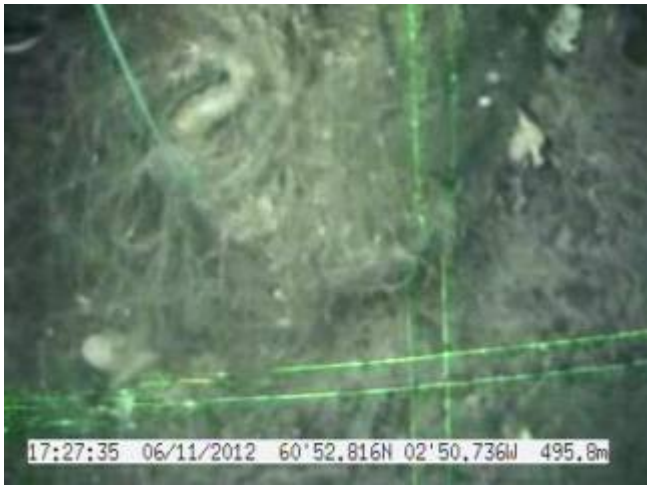
In total, nineteen incidences of trawl scars or potential evidence of trawling, otter beam marks or possible dragging pot marks were seen in Faroe-Shetland Sponge Belt Scottish Nature Conservation MPA Proposal tows, the deepest incidence at 519m below sea level. Nineteen additional incidences of litter dominated by rope and cable were also recorded (listed in Table 22, displayed on a map in Figure 19).

Table 21. Evidence of trawling on the Faroe-Shetland Sponge Belt Scottish Nature Conservation MPA Proposal survey area, 2012.



Potential Trawl mark
FSC10

Potential Deep otter door / trawl mark
FSC17



Litter - Monofilament net caught on boulder
FSC_B7

Litter - Steel hawser & rope
FSC11

Table 22. Positions of evidence of trawling and litter in the Faroe-Shetland Sponge Belt Scottish Nature Conservation MPA Proposal survey area, 2012.

Disturbance Feature	Video Tow (event)	Sample Ref	Method	Position start / point	Position End	Depth (m bsl)
Iceberg Plough marks / potential trawl marks	FSC_B12	2020121107_FSC_B12_VHab1	Towed video	61.291366 -1.683666	60.30015 -1.68905	463
	FSC_B5	20121106_FSC_B5_VHab1	Towed video	60.6209 - 3.39485	60.612733 -3.3917	470
	FSC_B6	20121106_FSC_B6_VHab1	Towed video	60.6748 - 3.35455	60.665566 -3.352883	500.4
	FSC_B7	20121106_FSC_B7_VHab1	Towed video	60.881466 -2.84545	60.871516 -2.844366	495
Litter - Electrical Cable	FSC10	FSC10_IMG_1981	Photographic Still	59.9005 - 5.387		500
Litter - Fish hook	FSC02	FSC02_IMG_1505_2	Photographic Still	59.790645 -5.734315		565
Litter - Metal rod	FSC20	FSC20_IMG_2397	Photographic Still	60.43328 -4.08798		498
Litter - Monofilament fishing net & rope or cable	FSC_B7	20121106_FSC_B7_VHab1	Towed video	60.881466 -2.84545	60.871516 -2.844366	495
Litter - Rope	FSC03	FSC03_IMG_1594	Photographic Still	59.789272 -5.597625		441
	FSC10	FSC10_IMG_1970	Photographic Still	59.90302 -5.38778		504
	FSC10	FSC10_IMG_1996	Photographic Still	59.89786 -5.38777		495
	FSC11	FSC11_IMG_2068	Photographic Still	60.00021 -5.06001		466
	FSC15	FSC15_IMG_2203	Photographic Still	60.15274 -4.63047		438
	FSC16	20121105_FSC16_VHab1	Towed video	60.192883 -4.56125	60.200333 -4.571266	476.4
	FSC18	20121105_FSC18_VHab1	Towed video	60.279166 -4.344983	60.283216 -4.361383	466.1
	FSC19	20121105_FSC19_VHab1	Towed video	60.38005 -4.166083	60.380466 -4.174783	469
Litter - Rope & mug	FSC15	20121105_FSC15_VHab1	Towed video	60.152033 -4.6311	60.160133 -4.623666	436
Litter - Rope & wire	FSC18	FSC18_IMG_2352	Photographic Still	60.28037 -4.35033		473
Litter - Steel hawser	FSC17	20121105_FSC17_VHab1	Towed video	60.2612 - 4.451366	60.26555 -4.466083	511
Litter - Steel hawser	FSC17	FSC17_IMG_2334	Photographic Still	60.26502 -4.4646		529

Disturbance Feature	Video Tow (event)	Sample Ref	Method	Position start / point	Position End	Depth (m bsl)
Litter - Steel hawser & rope	FSC11	20121105_FSC11_VHab1	Towed video	60.004316 -5.060983	59.9952 - 5.0602	477
Litter - Steel hawser & rope	FSC11	20121105_FSC11_VHab1	Photographic Still	60.00268 -5.06051		474
Litter - unspecified	FSC_B11	2020121107_FSC_B11_VHab1	Towed video	61.2628 - 1.802383	61.271983 -1.802533	499
Trawl Marks - definite	FSC10	20121105_FSC10_VHab1	Towed video	59.9033 - 5.387766	59.8941 - 5.386133	509
Trawl Marks - potential	FSC_B11	2020121107_FSC_B11_VHab1	Towed video	61.2628 - 1.802383	61.271983 -1.802533	499
	FSC_B2	20121105_FSC_B2_VHab1	Towed video	60.44275 -3.728783	60.451616 -3.731616	415
	FSC_B3	FSC_B3_IMG_2502	Photographic Still	60.543080 -3.684410		494.2
	FSC_B3	FSC_B3_IMG_2507	Photographic Still	60.543791 -3.68521		495.3
	FSC_B3	FSC_B3_IMG_2508	Photographic Still	60.544028 -3.685513		495.4
	FSC_B3	FSC_B3_IMG_2527	Photographic Still	60.546566 -3.687783		498.8
	FSC05	20121103_FSC05_VHab1	Towed video	59.8756 - 5.481233	59.884 - 5.474116	519
	FSC10	FSC10_IMG_1974	Photographic Still	59.90138 -5.38718		503
	FSC11	20121105_FSC11_VHab1	Towed video	60.004316 -5.060983	59.9952 - 5.0602	477
	FSC17	20121105_FSC17_VHab1	Towed video	60.2612 - 4.451366	60.26555 -4.466083	511
	FSC19	20121105_FSC19_VHab1	Towed video	60.38005 -4.166083	60.380466 -4.174783	469
	FSC20	20121105_FSC20_VHab1	Towed video	60.433183 -4.087816	60.4364 - 4.093883	498
	FSC20	FSC20_IMG_2403	Photographic Still	60.4345 - 4.08996		502
	FSC20	FSC20_IMG_2412	Photographic Still	60.43597 -4.09296		503

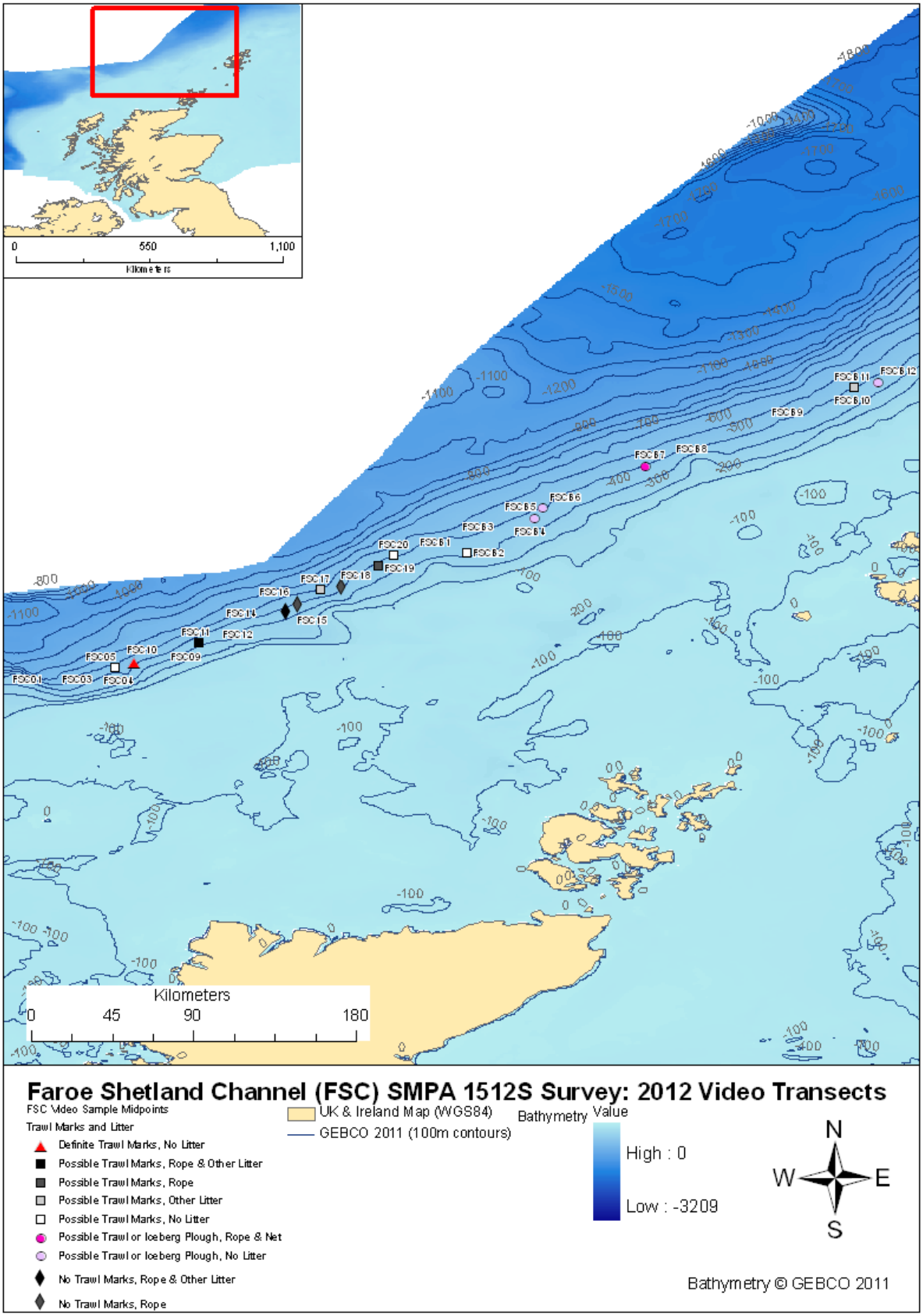


Figure 19. Locations of evidence of trawling, disturbance and litter on the Faroe-Shetland Sponge Belt Scottish Nature Conservation MPA Proposal survey area in 2012. Data from whole video tows as individual video sample centre points (FSC Video Points). Photo samples (FSC Stills Points), taken at approximately 20 or 60 second intervals, were analysed from all stations however are not visible at the current map scale.

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Appendix 1 – Video & Stills Analysis Recording Proforma

Video and stills analysis scoring/recording form used throughout this seabed imagery analysis contract. This form was printed for scoring video clips and kept digitally for stills analysis. All Marine Recorder v4 required and optional fields are included.

SURVEY NAME:		Survey Name	Survey Name
1.General (Whole tow)			
Event Name		Tow 1	Tow 1
Location			
Event Reference			
EventDate			
Projection			
AreaDerivedFrom			
Type (point / line)			
SWCorner/start (Lat/Long)			
NECorner/end (Lat/Long)			
Surveyor Names (all)			
Event Start Time			
Event End Time			
Event Start Depth			
Event End Depth			
Event Description **(Brief: physical & biotic, # habitats in tow)** **Include any Annex 1 habitats and special species.** **Don't use abbreviations in MR data entry**			
Video Quality			
Stills quality good enough for habitat y/n			
2.Sample Page (Each habitat split/still)			
Habitat Name (100 characters)			
Sample Ref		Yyyymmdd FSC VTR## VHab1	FSC_VTR##_IMG_####
Method (stills or towed video)			
StartTime (hh:mm:ss)			
EndTime (hh:mm:ss)			
Duration (hh:mm:ss)			
Surveyor Name (Sample)			
Surveyor Name (MRDE)			
Sample Start position (Lat/Long)			
Sample End position (Lat/Long)			
Sample Description (Habitat, Depths, Charactistic Species, Features - Species of Interest (if no species state whether it was because resolution too poor or generally no species)			
Habitat type (Eunis level 3)			
1st JNCC Biotope Name (n/a)			
Name of Scottish MPA search features			
Reef Type (Irving 2009; stony, rocky or biogenic)			
Reef Quality (Irving 2009; low, medium, high)			
Annex 1 Reef (none / potential / definite)			
Species of Conservation Interest			

Evidence of Trawling			
Litter			
3.HabitatDetails			
SeaLevel Start			
SeaLevel End			
Depth Band			
BiologicalZone			
Inclination% (overhangs, vertical faces80-100, v steep faces40-80, upper faces0-40, under boulders			
Modifiers (state if Hypersaline, WaveSurged, Sheltered, TidalCurrentsAccelerated, TidalCurrentsDecelerated, Shading, Grazing, Pollution)			
Substratum% (5%minimum except if something is just present but notable 1%)			
Bedrock			
Boulders			
Boulders_over1024mm			
Boulders_512to1024mm			
Boulders_256to512mm			
Cobbles_64to256mm			
Pebbles_16to64mm			
Shells_Empty			
Shells_LiveModiolus			
Gravel			
Gravel_Stone_4to16mm			
Gravel_Shell_4to16mm			
Gravel_DeadMaerl			
Gravel_LiveMaerl			
Sand			
Sand_Coarse_1to4mm			
Sand_Medium_0_25to1mm			
Sand_Fine_0_063to0_25mm			
Mud_lessthan0_063mm			
Artificial			
ArtificialMetal			
ArtificialConcrete			
ArtificialWood			
Trees_branches			
Algae			
Peat			
RockFeatures_1to5			
SurfaceRelief_Even_Rugged			
Texture_Smooth_Pitted			
Stability_Stable_Mobile			
Scour_None_Scoured			
Silt_None_Silted			
FissuresOver10mm_None_Many			
CrevisesUnder10mm_None_Many			
BoulderCobblePebbleShape_Rounded_Angular			
Rockpools_None_All			
RockFeatures (State if present [Gully, Cave, Tunnel, Rockmill, BoulderCobbleOnRock, BoulderCobbleOnSediment, BoulderHoles, SedimentOnRock])			

SedimentFeatures_1to5			
SurfaceRelief_Even_Uneven			
Firmness_Firm_Soft			
Stability_Stable_Mobile			
Sorting_Well_Poor			
BlackLayer			
SedimentFeatures (State if any present [MoundsCasts, BurrowsHoles, Tubes, AlgalMat, WavesDunes, Ripples, StandingWater, DrainageChannelsCreeks, PSA])			
COMMENTS on sample			
4.Species			
SurveyMethod			
SurveyMethodComment			
ReplicateRef			
NumDeployments			
RecordQuality			
SpeciesDataType			
Determiner			
Area of View/Survey			
5. Taxa: Provide Species Name in column A and the following as applicable: Qualifier (e.g. Lifeform, colour, burrows etc), uncertain Y-Res/Y-ID/N, Characterising Sp y/n, SACFOR, Count	**MR Qual**		
Taxa 1	Sp 1		
Taxa 2	Tubes		
Taxa 3			
Taxa 4			
Taxa 5			
Taxa 6			
Taxa 7			

Appendix 2: Scottish MPA Project Search Features

Details of Scottish MPA project search features used to underpin the selection of Nature Conservation MPAs in Scottish territorial and offshore waters. Information relating to features came from a variety of web resources including: http://jncc.defra.gov.uk/page-1584; http://www.habitas.org.uk/marinelife/index.html?item=about; http://www.snh.gov.uk/protecting-scotlands-nature/protected-areas/national-designations/marine-protected-areas/mpa-gap-analysis/; & http://www.marlin.ac.uk/species.php

Seabed habitats being used to underpin the selection of Nature Conservation MPAs.	
1. **Blue mussel beds (Territorial Waters).**	
1.1. *Mytilus edulis* beds on sublittoral sediment (SS.SBR.SMus.MytSS).	Shallow sublittoral mixed sediment, in fully marine coastal habitats or sometimes in variable salinity conditions in the outer regions of estuaries, are characterised by beds of the common mussel *Mytilus edulis*. Other characterising epifaunal species include the whelks *Nucella lapillus* and *Buccinum undatum*, the common starfish *Asterias rubens* the spider crab *Maja squinado* and the anemone *Urticina felina*.
2. **Burrowed mud (Territorial & Offshore Waters).**	
2.1. Seapens and burrowing megafauna in circalittoral fine mud (SS.SMu.CFiMu.SpnMeg).	Plains of fine mud at depths greater than about 15m may be heavily bioturbated by burrowing megafauna; burrows and mounds may form a prominent feature of the sediment surface with conspicuous populations of seapens, typically *Virgularia mirabilis* and *Pennatula phosphorea*. The burrowing crustacea present typically include *Nephrops norvegicus*, which is frequently recorded from surface observations although grab sampling may fail to sample this species. Indeed, some forms of sampling may also fail to indicate seapens as characterising species. This biotope also seems to occur in deep offshore waters in the North Sea, where densities of *Nephrops norvegicus* may reach 68 per 10m-2 (see Dyer et al1982, 1983), and the Irish Sea. The burrowing anemone *Cerianthus lloydii* and the ubiquitous epibenthic scavengers *Asterias rubens*, *Pagurus bernhardus* and *Liocarcinus depurator* are present in low numbers in this biotope whilst the brittlestars *Ophiura albida* and *Ophiura ophiura* are sometimes present, but are much more common in slightly coarser sediments. Low numbers of the anemone *Pachycerianthus multiplicatus* may also be found, and this species, which is scarce in the UK, appears to be restricted to this habitat (Plaza & Sanderson 1997).
2.2. Burrowing megafauna and *Maxmuelleria lankesteri* in circalittoral mud (SS.SMu.CFiMu.MegMax)	In circalittoral stable mud distinctive populations of megafauna may be found. These typically include *Nephrops norvegicus*, *Calocaris macandreae* and *Callianassa subterranea*. Large mounds formed by the echiuran *Maxmuelleria lankesteri* are also frequent in this biotope. The seapen *Virgularia mirabilis* may occur occasionally in this biotope but not in the same abundance as SpnMeg to which MegMax is closely allied.

2.3. Tall seapen *Funiculina quadrangularis*	Found in deep sheltered waters up to 200m depth it has also been recorded from as shallow as 20m in some sea lochs. In the UK it is almost entirely restricted to western Scotland and the Hebrides; Scottish populations are considered of global importance.
2.4. Fireworks anemone *Pachycerianthus multiplicatus*	This large burrowing sea anemone is similar to *Cerianthus lloydii* but much larger. The length of the column and span of the tentacles is up to 300mm and the column is much stouter than in the common *Cerianthus lloydii*. The colour of the inner tentacles is pale buff or chestnut, marginal tentacles whitish with fine brown bands, or plain white. There are up to 200 very long marginal tentacles.
2.5. Mud burrowing amphipod *Maera loveni*	This amphipod lives in burrows in muds in depths of 20-400m. It is a northern cold water species that has reached its southern limit in Scotland where it is sparsely distributed around the coast. Ninety-five percent of British records are from sea lochs and the northern North Sea.
3. **Flame shell beds (Territorial Waters).**	
3.1. *Limaria hians* beds in tide-swept sublittoral muddy mixed sediment. SS.SMx.IMx.Lim	Mixed muddy gravel and sand often in tide-swept narrows in the entrances or sills of sealochs with beds or 'nests' of *Limaria hians*. The *Limaria* form woven 'nests' or galleries from byssus and fragments of seaweeds so that the animals themselves cannot be seen from above the seabed.
4. **Horse mussel beds (Territorial Waters).**	
4.1. *Modiolus modiolus* beds with hydroids and red seaweeds on tide-swept circalittoral mixed substrata. CR.MCR.M.ModT	*Modiolus* beds on mixed substrata (cobbles, pebbles and coarse muddy sediments) in moderately strong currents or wave exposed areas, typically on the open coast but also in tide-swept channels of marine inlets. *Ophiothrix fragilis* are often common in this biotope along with the calcareous tubes of *Pomatoceros triqueter*, anemones such as *Alcyonium digitatum* and *Urticina felina* and hydroids such as *Abietinaria abietina* and *Sertularia argentea*. *Buccinum undatum* may also be important and in some areas the clam *Chlamys varia* may be frequent but not in the same abundances as in ModCvar. Little information on the infaunal component is given here although it is likely that it is very rich and may highlight more subtle differences in the *Modiolus* biotopes. This biotope is typified by examples off the north-west Lleyn Peninsula in N Wales and off Co. Down, Northern Ireland.
4.2. *Modiolus modiolus* beds on open coast circalittoral mixed sediment. SS.SBR. SMus.ModMx.	Muddy gravels and coarse sands in deeper water of continental seas may contain venerid bivalves with beds of *Modiolus modiolus*. The clumping of the byssus threads of the *M. modiolus* creates a stable habitat that attracts a very rich infaunal community with a high density of polychaete species. This biotope is very similar to SMX.PoVen and the 'boreal off-shore gravel association' and the 'deep Venus community' described by previous workers (Ford 1923; Jones 1951). Similar *Modiolus* beds (though with a less diverse infauna) on open coast stable boulders, cobbles and sediment are described under MCR.ModT.
4.3. *Modiolus modiolus* beds with fine hydroids and large solitary ascidians on very sheltered circalittoral	Beds or scattered clumps of *Modiolus modiolus* in generally sheltered conditions with only slight tidal movement. Typically occurs in sealochs and the Shetland voes.

mixed substrata. SS.SBR.SMus.ModHAs.	Brittlestars *Ophiothrix fragilis* and *Ophiocomina nigra*, as well as *Ophiopholis aculeata* are often frequent, sometimes forming a dense bed as described in OphMx. The queen scallop*Aequipecten opercularis* is often present in moderate abundances. Large solitary ascidians (*Ascidiella aspersa*, *Corella parallelogramma, Dendrodoa grossularia*) and fine hydroids (*Kirchenpaueria pinnata*) are present attached to the mussel shells. Decapods such as hermit crabs (*Pagurus bernhardus*) and spider crabs (*Hyas araneus*) are typically present. Coralline algal crusts may be found on the mussel shells, with some red seaweeds in shallower water such as *Phycodrys rubens*. Little information on the infaunal component is given here although it is likely that it is very rich and may highlight more subtle differences in the *Modiolus* biotopes.
4.4. *Modiolus modiolus* beds with *Chlamys varia,* sponges, hydroids and bryozoans on slightly tide-swept very sheltered circalittoral mixed substrata	Dense *Modiolus modiolus* beds, covered by hydroids and bryozoans, on soft gravelly, shelly mud with pebbles in areas of slight or moderate tidal currents. The variable scallop (*Chlamys varia*) is frequently found in large numbers amongst the*Modiolus* shells. Hydroids such as *Halecium* spp. and *Kirchenpaueria pinnata* and ascidians such as *Ascidiella aspersa*,*Corella parallelogramma* and *Ciona intestinalis* may be found attached to pebbles or mussel shells. The echinoderms*Ophiothrix fragilis* and *Antedon bifida* are often frequent in this biotope as is the encrusting polychaete *Pomatoceros triqueter*. Similar communities have been found on cobble and pebble plains in stable, undisturbed conditions in some sealochs, although not all these examples have *Modiolus* beds.
5. **Inshore deep mud with burrowing heart urchins (Territorial Waters).**	
5.1. *Brissopsis lyrifera* and *Amphiura chiajei* in circalittoral mud. SS.Smu.CfiMu.BlyrAchi.	Mud in deep offshore, or shallower stable nearshore, waters can be characterised by the urchin *Brissopsis lyrifera* and the brittle star *Amphiura chiajei*. Where intense benthic dredge fishing activity occurs, populations of the indicator species, *Brissopsis lyrifera* may be depressed, although broken tests may still remain (E.I.S. Rees pers. comm. 1997; M. Costello pers. comm. 1997). Low numbers of the seapen *Virgularia mirabilis* may be found in many examples of this biotope. In addition, in certain areas of the UK such as the northern Irish Sea, this community may also contain*Nephrops norvegicus* and can consequently be the focus for fishing activity (Mackie, Oliver & Rees 1995). Infaunal species in this community are similar to those found in SpnMeg and include the polychaetes *Nephtys hystricis*,*Pectinaria belgica*, *Glycera* spp. and *Lagis koreni* and the bivalves *Myrtea spinifera* and *Nucula sulcata*. This community is the 'Boreal Offshore Mud Association' and '*Brissopsis - Chiajei*' communities described by other workers (Petersen 1918; Jones 1950).
6. **Kelp and seaweed communities on sublittoral sediment (Territorial Waters). SS.SMp.KSwSS.**	Shallow sublittoral sediments which support seaweed communities, typically including the kelp *Laminaria saccharina*, the bootlace weed *Chorda filum* and various red and brown seaweeds, particularly filamentous types. The generally sheltered nature of these habitats enables the seaweeds to grow on shells and small stones which lie on the sediment surface; some communities develop as loose-lying mats on the sediment surface.

7. **Low or variable salinity habitats (Territorial Waters).**	
7.1. Faunal communities on variable or reduced salinity infralittoral rock.IR.LIR.IFaVS.	Shallow subtidal rocky habitats which support faunal-dominated communities, with seaweed communities only poorly developed or absent. In some sealochs dense mussel *Mytilus edulis* beds (MytRS) develop in tide-swept channels, whilst upper estuarine rocky habitats in the south-west coast rias may support particular brackish-water tolerant faunas (CcasEle; HarCon).
7.2. Kelp in variable or reduced salinity. IR.LIR.KVS.	Very wave-sheltered bedrock, boulders and cobbles subject to only weak tidal streams in the sublittoral fringe and infralittoral zone, in areas of variable/reduced salinity. This biotope complex is characterised by the kelp *Laminaria saccharina* and coralline crusts such as *Lithothamnion glaciale*. Grazers such as the urchins *Psammechinus miliaris* and *Echinus esculentus*, and the gastropods *Gibbula cineraria* and *Buccinum undatum* may be present. The tube-dwelling polychaete *Pomatoceros triqueter*, the ascidians *Ciona intestinalis*, *Corella parallelogramma* and *Ascidiella scabra*, the barnacle *Balanus crenatus*, the starfish *Asterias rubens* and the brittlestar *Ophiothrix fragilis* may also be present. Red algal communities are composed primarily of *Phycodrys rubens*. The crabs *Carcinus maenas* and *Pagurus bernhardus*, and the bivalve *Modiolus modiolus* may also be observed.
8. **Maerl beds (Territorial Waters). SS.SMp.Mr.**	Beds of maerl in coarse clean sediments of gravels and clean sands, which occur either on the open coast or in tide-swept channels of marine inlets (the latter often stony). In fully marine conditions the dominant maerl is typically*Phymatolithon calcareum* (SMP.Pcal), whilst under variable salinity conditions in some sealochs beds of *Lithothamnion glaciale* (SMP.Lgla) may develop.
9. **Maerl or coarse shell gravel with burrowing sea cucumbers (Territorial Waters).**	
9.1. *Neopentadactyla mixta* in circalittoral shell gravel or coarse sand. SS.SCS.CCS.Nmix.	Sublittoral plains of clean, shell, maerl and / or stone gravels or sometimes coarse sands, with frequent *Neopentadactyla mixta*. *Pecten maximus* may occur occasionally along with *Lanice conchilega*. Other epifaunal species may include *Ophiura albida, Pagurus* spp. and *Callionymus* spp. These sediments may be thrown into dunes by wave action or tidal streams. Widespread species such as *Cerianthus lloydii* and *Chaetopterus variopedatus* are present in many examples of this biotope. Scarcely recorded species such as *Molgula oculata*, *Ophiopsila annulosa* and *Amphiura securigera* may also be found. *O. annulosa* only occurs in records from the south-west of the British Isles. It should be noted that*Neopentadactyla* may exhibit periodicity in its projection out of, and retraction into, the sediment (Picton 1993).This biotope may be an epibiotic overlay of the biotope MedLumVen.
10. **Native oysters (Territorial Waters).**	
10.1. Ostrea edulis beds on shallow sublittoral muddy mixed sediment. SS.SMx.IMx.Ost.	Dense beds of the oyster *Ostrea edulis* can occur on muddy fine sand or sandy mud mixed sediments. There may be considerable quantities of dead oyster shell making up a substantial portion of the substratum. The clumps of dead shells and oysters can support large numbers of *Ascidiella aspersa* and *Ascidiella scabra*. Sponges such as *Halichondria*

	bowerbanki may also be present. Several conspicuously large polychaetes, such as *Chaetopterus variopedatus* and terebellids, as well as additional suspension-feeding polychaetes such as *Myxicola infundibulum* and *Sabella pavonina*may be important in distinguishing this biotope, whilst the Opisthobranch *Philine aperta* may also be frequent in some areas. A turf of seaweeds such as *Plocamium cartilagineum*, *Nitophyllum punctatum* and *Spyridia filamentosa* may also be present. This biotope description may need expansion to account for oyster beds in England.
10.2. Native oyster Ostrea edulis	*Ostrea edulis* is associated with highly productive estuarine and shallow coastal water habitats on firm bottoms of mud, rocks, muddy sand, muddy gravel with shells and hard silt. In exploited areas, suitable habitat is/has been created in the form of 'cultch' – broken shells and other hard substrata.
11. **Northern sea fan and sponge communities (Territorial Waters).**	
11.1. *Caryophyllia smithii* and *Swiftia pallida* on circalittoral rock. CR.MCR.EcCr.CarSwi.LgAs	This variant typically occurs on sheltered, ridged, circalittoral bedrock or boulders subject to only weak tidal streams, but may be found in somewhat more exposed conditions. It is found in water depths ranging from 15m to 32m. Commonly occurring *Swiftia pallida* characterises this heavily silted biotope along with *Caryophyllia smithii* and frequent *Alcyonium glomeratum*. Under the silt, bryozoan crusts such as *Parasmittina trispinosa* may be found. There is a strong echinoderm component to the community, with the tentacles of *Aslia lefevrei* frequently seen protruding from crevices in the ridged bedrock. *Holothuria forskali* is often seen on the upper faces of boulders and bedrock. *Marthasterias glacialis*, *Asterias rubens*, *Echinus esculentus*, *Henricia oculata* and *Luidia ciliaris* may also be present. A sparse hydroid turf may also be present, with species such as *Polyplumaria frutescens*, *Halecium halecinum* and *Nemertesia antennina*. In addition, there may be anthozoans such as *Isozoanthus sulcatus* and *Corynactis viridis*. The sponge *Suberites carnosus* is typically associated with a heavily silted habitat. Other sponges present include *Cliona celata*, *Stelligera stuposa* and *Polymastia boletiformis*. The only records are from the west coast of Ireland.
11.2. Mixed turf of hydroids and large ascidians with *Swiftia pallida* and *Caryophyllia smithii* on weakly tide-swept circalittoral rock. CR.HCR.XFa.SwiLgAs.	This biotope typically occurs from exposed through to sheltered circalittoral bedrock or boulders subject to moderately strong to weak tidal streams. It is found in water depths ranging from 4m to 37m. This biotope is distinguished by frequently occurring *Swiftia pallida*, abundant *Caryophilia smithii* and a diverse range of ascidians including *Clavelina lepadiformis*, *Ascidia mentula*, *Polycarpa pomaria*, *Diazona violacea* and *Corella parallelogramma*. A sparse, yet diverse hydroid turf is often apparent, with species such as *Aglaophenia tubulifera*, *Nemertesia antennina*, *Polyplumaria frutescens*, *Halecium halecinum*, *Abietinaria abietina*, *Nemertesia ramosa* and *Halopteris catharina* often recorded. Spaces amongst the turf are usually colonised by the polychaete *Pomatoceros triqueter* and encrusting red algae. Crinoids such as *Antedon petasus*, *Antedon bifida* and *Leptometra*

	celtica may be seen filter feeding on the tops of outcrops and boulders, along with the soft coral *Alcyonium digitatum*. Other echinoderms such as *Echinus esculentus*,*Crossaster papposus* and *Asterias rubens* may also be recorded. There may also be a bryozoan component to the sparse faunal turf. Species such as *Securiflustra securifrons* and *Eucratea loricata* as well as the crustose *Parasmittina trispinosa* are all usually present. There may be a few isolated growths of sponge, such as *Iophonopsis nigricans*,*Axinella infundibuliformis* and *Haliclona urceolus*. Other species that may be present include the brachiopod*Terebratulina retusa* and the top shell *Calliostoma zizyphinum*. The crustacean *Munida rugosa* may be visible in crevices. All records are from the west coast of Scotland (east coast of Lewis /Outer Hebrides).
11.3. Deep sponge communities (circalittoral). Cr.HCR.DpSp	This biotope complex typically occurs on deep (commonly below 30m depth), wave-exposed circalittoral rock subject to negligible tidal streams. The sponge component of this biotope is the most striking feature, with similar species to the bryozoan and erect sponge biotope complex (BrErSp) although in this case, the sponges *Phakellia ventilabrum*, *Axinella infundibuliformis*, *Axinella dissimilis* and *Stelligera stuposa* dominate. Other sponge species frequently found on exposed rocky coasts are also present in low to moderate abundance. These include *Cliona celata*, *Polymastia boletiformis*,*Haliclona viscosa*, *Pachymatisma johnstonia*, *Dysidea fragilis*, *Suberites carnosus*, *Stelligera rigida*, *Hemimycale columella* and *Tethya aurantium*. The cup coral *Caryophyllia smithii* and the anemone *Corynactis virdis* may be locally abundant in some areas, along with the holothurian *Holothuria forskali*. The soft corals *Alcyonium digitatum* and*Alcyonium glomeratum* are frequently observed. The bryozoans *Pentapora foliacea* and *Porella compressa* are also more frequently found in this deep-water biotope complex. Bryozoan crusts such as *Parasmittina trispinosa* are also occasionally recorded. Isolated clumps of large hydroids such as *Nemertesia antennina*, *Nemertesia ramosa* and*Sertularella gayi* may be seen on the tops of boulders and rocky outcrops. Large echinoderms such as *Echinus esculentus*, *Luidia ciliaris*, *Marthast erias glacialis*, *Strichastrella rosea*, *Henricia oculata* and *Aslia lefevrei* may also be present. The sea fan *Eunicella verucosa* may be locally common but to a lesser extent than in ByErSp.Eun. The top shell *Calliostoma zizyphinum* is often recorded as present.
12. **Low or limited mobility species being used to underpin the selection of Nature Conservation MPAs. (Territorial Waters).**	
12.1. Burrowing sea anemone aggregations - *Arachnanthus sarsi*	This large tube-dwelling sea anemone lives buried in mud, sand or shelly mud between 10m and 36m depth. There are scattered records from St Kilda, the Inner and Outer Hebrides and the Firth of Lorn with one further record from Shetland. It is considered nationally rare at the UK scale and Scottish populations may be of international importance as the majority of the records are from Scotland. Populations appear to be isolated and fragmented and recruitment is likely to be sporadic.

12.2. Northern feather star aggregations on mixed substrata - *Leptometra celtica*	Commonly found on sediment, shell, gravel or bedrock from 40m to 200m depth, it can on occasions form very dense aggregations on the sea bed. The majority of records from the UK are from the west and north coasts of Scotland and Shetland
12.3. Fan mussel aggregations (Snails, clams, mussels and oysters)- *Atrina fragilis*	The fan mussel is one of Britain's largest molluscs growing up to 48cm in length it is found embedded in the sediment with one end protruding into the water column. It is one of the most endangered molluscs in the UK and considered nationally scarce, with over 50% of recent records from Scottish waters on the western and northern coasts. The densest known bed of fan mussels has been discovered recently in a dredge spoil disposal site off Canna.
12.4. Heart cockle aggregations - *Glossus humanus*	
12.5. Ocean quahog aggregations - *Arctica islandica*	*Arctica islandica* is found at extreme low water level but predominately on sub-littoral firm sediments including level offshore areas, buried (or part buried) in sand and muddy sand that ranges from fine to coarse grains. *Arctica islandica* has a heavy, thick, oval to rounded shell up to 13cm in length. The shell is sculptured with numerous fine concentric lines and the beaks are anterior. It has a thick glossy periostracum that is brown in smaller individuals, becoming greenish-brown to black in larger specimens. The periostracum peels away on dead shells, revealing a white to pale brown shell beneath.
13. **Mobile species being used to underpin the selection of Nature Conservation MPAs. (Territorial Waters).**	
13.1. European spiny lobster - *Palinurus elephas*	Carapace covered with forward-directed spines; supra-orbital spines particularly prominent. Antennal stalks very heavy and spiny; flagellum stout, tapering and longer than body. Typically orange colouration but may also be brown, sandy or purple. There are two large symmetrical white blotches on the tergites of somites 1-5, a single central blotch on the last segment and two blotches on the telson. Small hook like claws. *Palinurus elephas* typically crawls on the substratum but may occasionally be found to swim. Mercer (1973, cited in Hunter, 1999) describes the species as 'typically gregarious'.
13.2. Sandeels - *Ammodytes marinus* & *A. tobianus*	*Ammodytes marinus* is a schooling bentho-pelagic species, which may congregate in large schools near the surface or bury itself in sand. It may be found both inshore and offshore. *Ammodytes marinus* is a thin and elongated sand eel with a pointed jaw. It can reach a maximum length of 25cm. Its dorsal colouring is usually dark green, while the ventral and lateral sides are silvery in colour. There is a single long dorsal fin, and the anal fin is half the length of the dorsal fin. The tail fin is small and distinctively forked. The lower jaw is distinctly longer than the upper jaw. *Ammodytes tobianus* is found from mid-tide level over sandy shores to the shallow sublittoral to depths of 30 metres. They bury themselves 20-50cm deep in the sand during the winter. *Ammodytes tobianus* is the most abundant species of sand eel found in British waters. It has been reported to spawn in spring and summer (Dipper, 2001) or spring and autumn (FishBase, 2000). Eggs are laid in the sand where they adhere to the sand grains. Each

	female produces 4000-20,000 eggs, which hatch after a few weeks. Their diet consists of zooplankton and some large diatoms as well as worms, small crustaceans and small fish. They swim in schools with heads down and dart into the sand immediately on sign of danger.
13.3. Common skate - *Dipturus batis* complex	Benthic species in shelf and slope waters with a wide tolerance for depth and temperature. Found in coastal waters mainly within the 200m range. Feed on all kinds of bottom animals, large individuals prefer fish. Oviparous. Distinct pairing with embrace. Young may tend to follow large objects, such as their mother. Mate in spring and the egg capsules are laid during the summer. Eggs are oblong capsules with stiff pointed horns at the corners deposited in sandy or muddy flats. Egg capsules are 10.6-24.5cm long and 5.0-14.5cm wide. About 40 eggs per individual are laid annually. Flesh is marketed fresh or smoked.
14. **Annex I Reef Habitats** Reefs can be either biogenic concretions or of geogenic origin. They are hard compact substrata on solid and soft bottoms, which arise from the sea floor in the sublittoral and littoral zone. Reefs may support a zonation of benthic communities of algae and animal species as well as concretions and corallogenic concretions. • Arise from the sea floor means: the reef is topographically distinct from the surrounding seafloor. • Such hard substrata that are covered by a thin and mobile veneer of sediment are classed as reefs if the associated biota are dependent on the hard substratum rather than the overlying sediment.	
Hard compact substrata are: rocks (including soft rock, e.g. chalk), boulders and cobbles (generally >64mm in diameter)	
Biogenic concretions are defined as: concretions, encrustations, corallogenic concretions and bivalve mussel beds originating from dead or living animals, i.e. biogenic hard bottoms which supply habitats for epibiotic species.	
Geogenic reefs are formed by non biogenic substrata.	
A variety of subtidal topographic features are included in this habitat complex such as: Hydrothermal vent habitats, sea mounts, vertical rock walls, horizontal ledges, overhangs, pinnacles, gullies, ridges, sloping or flat bed rock, broken rock and boulder and cobble fields.	

Seabed habitats being used to underpin the selection of Nature Conservation MPAs: **Offshore Waters.**	
15. **Burrowed mud (Territorial & Offshore Waters).**	
15.1. Seapens and burrowing megafauna in circalittoral fine mud	Extensively distributed throughout the sea lochs of the west coast, Hebrides and voes of Shetland it occurs at depths of between 10-100m. It supports a diverse burrowing fauna and in particular various seapens in the deeper, sheltered areas. The majority of the UK records are from Scotland. Plains of fine mud at depths greater than about 15m may be heavily bioturbated by burrowing megafauna; burrows and mounds may form a prominent feature of the sediment surface with conspicuous populations of seapens, typically*Virgularia mirabilis* and *Pennatula phosphorea*. The burrowing crustacea present typically include *Nephrops norvegicus*, which is frequently recorded from surface observations although grab sampling may fail to sample this species. Indeed, some forms of sampling may also fail to indicate seapens as characterising species. This biotope also seems to occur in deep offshore waters in the North Sea, where densities of *Nephrops norvegicus* may reach 68 per 10m-2 (see Dyer et al1982, 1983), and the Irish Sea. The burrowing anemone *Cerianthus lloydii* and the ubiquitous epibenthic scavengers*Asterias rubens*, *Pagurus bernhardus* and *Liocarcinus depurator* are present in low numbers in this biotope whilst the brittlestars *Ophiura albida* and *Ophiura ophiura* are sometimes present, but are much more common in slightly coarser sediments. Low numbers of the anemone *Pachycerianthus multiplicatus* may also be found, and this species, which is scarce in the UK, appears to be restricted to this habitat (Plaza & Sanderson 1997). The infauna may contain significant populations of the polychaetes *Pholoe* spp., *Glycera* spp., *Nephtys* spp., spionids, *Pectinaria belgica* and *Terebellides stroemi*, the bivalves *Nucula sulcata*, *Corbula gibba* and *Thyasira flexuosa*, and the echinoderm *Brissopsis lyrifera*.
15.2. Burrowing megafauna and *Maxmuelleria lankesteri* in circalittoral mud	In circalittoral stable mud distinctive populations of megafauna may be found. These typically include *Nephrops norvegicus*, *Calocaris macandreae* and *Callianassa subterranea*. Large mounds formed by the echiuran *Maxmuelleria lankesteri* are also frequent in this biotope. The seapen *Virgularia mirabilis* may occur occasionally in this biotope but not in the same abundance as SpnMeg to which MegMax is closely allied. Infaunal species may include *Nephtys hystricis*,*Chaetozone setosa, Amphiura chiajei* and *Abra alba*.
15.3. Tall seapen *Funiculina quadrangularis*	Found in muddy substrata on sheltered coasts, especially in sea lochs. Sublittoral to deep offshore water. A tall, narrow sea pen, which can exceed 2 metres in height. It has a calcareous white axis, square in section. The polyps are irregularly arranged along the axis or tend to form oblique rows. They are white or pale pink in colour. Found in deep sheltered waters up to 200m depth it has also been recorded from as shallow as 20m in some sea lochs. In the UK it is almost entirely restricted to western Scotland and the Hebrides; Scottish populations are considered of global importance.

15.4. Fireworks anemone *Pachycerianthus multiplicatus*	This large burrowing sea anemone is similar to *Cerianthus lloydii* but much larger. The length of the column and span of the tentacles is up to 300mm and the column is much stouter than in the common *Cerianthus lloydii*. The colour of the inner tentacles is pale buff or chestnut, marginal tentacles whitish with fine brown bands, or plain white. There are up to 200 very long marginal tentacles.
15.5. Mud burrowing amphipod *Maera loveni*	This amphipod lives in burrows in muds in depths of 20-400m. It is a northern cold water species that has reached its southern limit in Scotland where it is sparsely distributed around the coast. Ninety-five percent of British records are from sea lochs and the northern North Sea.
16. **Carbonate mound communities (Offshore Waters).**	These are typically steep-sided mounds that may be up to 350m high, formed from the debris of cold water coral reefs occurring at depths of between 500 and 1100m. They support a diverse community comprising echiuran worms, sponges, bryozoans, soft corals, ascidians, tube worms, crinoids and bivalve molluscs. They are known to occur on the Hatton Bank in the far west of Scottish waters but have a wider distribution in the north-east Atlantic such as the Porcupine Bank and the Rockall Trough.
17. **Coral gardens (Offshore Waters).**	These are highly diverse habitats comprising dense aggregations of corals which may reach densities of between 100 and 700 colonies per 100m ^{2}. Coral gardens can occur on both soft and hard substrate. They favour areas where there is a moderate to strong current and include solitary hard corals, sea pens, bamboo coral, gorgonians, hydro-corals and black coral. The associated fauna is also biodiverse comprising basket stars, brittlestars, featherstars, molluscs, crustaceans and various fish species. At present in Scottish waters they are known principally from the Anton Dohrn sea mount but further surveys are likely to discover new locations.
18. **Deep sea sponge aggregations (Offshore Waters).**	Deep sea sponge aggregations are found on both hard and soft substrates at depths of between 250 and 1300m; ancient iceberg plough marks are an ideal habitat as the stable boulders and cobbles provide numerous attachment points for the sponges. They are composed principally of glass sponges and the giant sponges (*Desmospongia*). The spicules from dead sponges that cover the seabed inhibit the colonisation of the sediments by burrowing animals but the sponges provide an ideal attachment point for brittlestars lifting them above the sea bed where they can catch passing food particles. At present these aggregations are known from the Faroe-Shetland Sponge Belt at around 500m deep and also occur in the Porcupine Seabight in the north-west Atlantic.
19. **Northern sea fan and sponge communities (Territorial Waters).**	
19.1. Deep sponge communities (circalittoral). CR.HCR.DpSp	This biotope complex typically occurs on deep (commonly below 30m depth), wave-exposed circalittoral rock subject to negligible tidal streams. The sponge component of this biotope is the most striking feature, with similar species to the bryozoan and erect sponge biotope complex (BrErSp) although in this case, the sponges *Phakellia ventilabrum*, *Axinella*

	infundibuliformis, *Axinella dissimilis* and *Stelligera stuposa* dominate. Other sponge species frequently found on exposed rocky coasts are also present in low to moderate abundance. These include *Cliona celata*, *Polymastia boletiformis*,*Haliclona viscosa*, *Pachymatisma johnstonia*, *Dysidea fragilis*, *Suberites carnosus*, *Stelligera rigida*, *Hemimycale columella* and *Tethya aurantium*. The cup coral *Caryophyllia smithii* and the anemone *Corynactis virdis* may be locally abundant in some areas, along with the holothurian *Holothuria forskali*. The soft corals *Alcyonium digitatum* and*Alcyonium glomeratum* are frequently observed. The bryozoans *Pentapora foliacea* and *Porella compressa* are also more frequently found in this deep-water biotope complex. Bryozoan crusts such as *Parasmittina trispinosa* are also occasionally recorded. Isolated clumps of large hydroids such as *Nemertesia antennina*, *Nemertesia ramosa* and*Sertularella gayi* may be seen on the tops of boulders and rocky outcrops. Large echinoderms such as *Echinus esculentus*, *Luidia ciliaris*, *Marthasterias glacialis*, *Strichastrella rosea*, *Henricia oculata* and *Aslia lefevrei* may also be present. The sea fan *Eunicella verucosa* may be locally common but to a lesser extent than in ByErSp.Eun. The top shell *Calliostoma zizyphinum* is often recorded as present.
19.2. Northern sea fan *Swiftia pallida*	Found on rocks and boulders from depths of 15-60m, most frequently below 20m. Also recorded on coarse pebbles lying in coarse shell sand with silt. May occur at depths of 2380 m (see additional information). A small sea fan which forms slender colonies with little branching. Up to 20cm tall but usually 7-10cm. Branches are irregularly orientated. Colour white or greyish, sometimes with a pinkish tinge.
20. **Offshore deep sea muds (Offshore Waters).**	
20.1. *Ampharete falcata* turf with *Parvicardium ovale* on cohesive muddy sediment near margins of deep stratified seas. SS.SMu.OMu.AfalPova	Dense stands of [Ampharete falcata] tubes which protrude from muddy sediments, appearing as a turf or meadow in localised areas. These areas seem to occur on a crucial point on a depositional gradient between areas of tide-swept mobile sands and quiescent stratifying muds. Dense populations of the small bivalve [Parvicardium ovale] occur in the superficial sediment. Other infauna in this diverse biotope includes [Lumbrineris scopa], [Levinsenia] sp., [Prionospio steenstrupi], [Diplocirrus glaucus] and [Praxillella affinis] although a wide variety of other infaunal species may also be found. Both the brittlestars [Amphiura filiformis] and [Amphiura chiajei] may be present together with [Nephrops norvegicus] in higher abundance than the BlyrAchi or AfilEcor biotopes. Substantial populations of mobile epifauna such as [Pandalus montagui] and smaller fish also occur, together with those that can cling to the tubes, such as [Macropodia] spp. A similar turf of worm tubes formed by the maldanid polychaete [Melinna cristata] has been recorded from Northumberland (Buchanan 1963). Nephrops trawling may severely damage this biotope and it is possible that such activity has destroyed examples of this biotope in the Irish Sea (E.I.S. Rees pers. comm. 2002).

20.2. Foraminiferans and *Thyasira* sp. in deep circalittoral fine mud. SS.SMu.OMu.ForThy	In deep water and soft muds of Boreal and Arctic areas, a community dominated by foraminiferans and the bivalve *Thyasira* sp. (e.g. *T. croulinensis and T. pygmaea*) may occur (Thorson 1957; K [illegible] 1992). Foraminiferans such as *Saccammina*, *Psammosphaera*, *Haplophragmoides*, *Crithionina* and *Astorhiza* are important components of this community with dead tests numbering thousands per m2 (see Stephen 1923; McIntyre 1961) and sometimes visible from benthic photography (Mackie, Oliver & Rees 1995). It is likely that a community dominated by *Astorhiza* in fine sands in the Irish Sea may be another distinct biotope (E.I.S. Rees pers. comm. 2002). Polychaetes, e.g. *Paraonis gracilis*,*Myriochele heeri*, *Spiophanes kroyeri*, *Tharyx* sp., *Lumbrineris tetraura*, are also important components of this biotope. These communities appear to have no equivalent on the continental plateau further south (Glemarec 1973) but are known from the edge of the Celtic Deep in the Irish Sea (Mackie, Oliver & Rees 1995). The benthos in these offshore areas has been shown to be principally Foraminifera and similar, rich communities may exist in Scottish sealochs (McIntyre 1961). Communities from yet deeper (northern) waters at the extremes of the North Sea may be reminiscent, although dissimilar to ForThy (see Pearson *et al* 1996) reflecting a higher proportion of silt/clay. A fully Arctic version of this biotope has also been described (Thorson 1934, 1957) although it should be noted that Jones (1950) considered this Boreal foraminiferan community to be part of a 'Boreal Deep Mud Association'.
20.3. *Levinsenia gracilis* and *Heteromastus filifirmis* in offshore circalittoral mud and sandy mud. SS.SMu.OMu.LevHet	In deep offshore mud and sandy mud a community characterised by the polychaetes [Levinsenia gracilis] and [Heteromastus filiformis] may occur. Other important taxa may include [Paramphinome jeffreysii], [Nephtys hystricis] and [N. incisa], [Spiophanes kroyeri], [Orbinia norvegica], [Terebellides stroemi], [Thyasira gouldi] and [Thyasira equalis]. Burrowing megafauna such as [Calocaris macandreae] may also be found in this biotope. This biotope has been found in the central and northern North Sea. A similar community, dominated by [L. gracilis] but accompanied by [Glycera] spp. (particularly [Glycera rouxii]) and [Monticellina dorsobranchialis], has also been reported from the Irish Sea. This Irish community also contains [Calocaris macandreae], [Mediomastus fragilis], [Tubificoides amplivasatus], [Nephtys incisa], [Ancistrosyllis groenlandica], [Nucula sulcata], [Litocorsa stremma] and [Minuspio] sp. and it is not known at present whether this represents a separate biotope or whether it is a geographic variant of a wider [Levinsenia] biotope. Situation: This biotope has been found in the central and northern North Sea and may also occur in the Irish Sea
20.4. *Paramphinome jeffreysii*, *Thyasira* spp. and *Amphiura filiformis* in offshore circalittoral sandy mud. SS.SMu.OMu.PjefThyAfil	Deep, offshore cohesive sandy mud communities characterised by the polychaete [Paramphinome jeffreysii], bivalves such as [Thyasira equalis] and [Thyasira gouldi] and the brittlestar [Amphiura filiformis]. Other taxa may include Laonice cirrata, the sea cucumber Labidoplax buski and the polychaetes [Goniada maculata], [Spiophanes kroyeri] and [Aricidea catherinae]. [Amphiura chiajei] may be occasional in this biotope as may [Philine scabra], [Levinsenia gracilis] and [Pholoe inornata]. This biotope along with SMU.ThyNten,

	SMU.AfilMysAnit, SMU.AfilNten and SSA.OfusAfil, may comprise the [Amphiura] dominated components of the 'off-shore muddy sand association' (Jones 1951; Mackie 1990) and the infralittoral etage described by Glemarec (1973).
20.5. *Myrtea spinifera* and polychaetes in offshore circalittoral sandy mud. SS.SMu.OMu.MyrPo	Deep, offshore habitats with cohesive sandy mud (>20% mud) may support communities characterised by infaunal polychaetes and the bivalve [Myrtea spinifera]. Polychaetes typically include [Chaetozone setosa], [Paramphinome jeffreysii], [Levinsenia gracilis], [Aricidea catherinae] and [Prionospio malmgreni]. The bivalves [Thyasira] spp. and [Abra nitida] may also be found as may seapens, such as [Pennatula phosphorea]. Some examples of the biotope AfilNten contain [Myrtea spinifera] (Mackie 1990) in lower numbers but these habitats are generally sandier than those in MyrPo. Situation: This biotope has been recorded in the northern North Sea but may also exist in the Irish Sea.
21. **Offshore subtidal sands and gravels (Offshore Waters).**	
21.1. *Glycera lapidum*, *Thyasira* spp. and *Amythasides macroglossus* in offshore gravelly sand. SS.SCS.OCS.GlapThyAmy	Offshore (deep) circalittoral habitats with coarse sands and gravel, stone or shell and occasionally a little silt (<5%) may be characterised by the polychaetes [Glycera lapidum] and [Amythasides macroglossus] with the bivalve [Thyasira] spp. (particularly [Thyasira succisa]). Other taxa include polychaetes such as [Exogone verugera], [Notomastus latericeus], [Spiophanes kroyeri],[Aphelochaeta marioni] ([Tharyx marioni]) and [Lumbrineris gracilis] and occasional numbers of the bivalve [Timoclea ovata]. This biotope bears some resemblance to the shallow SCS.Glap and also to the circalittoral and offshore venerid biotopes (SCS.MedLumVen and SMX.PoVen) but differs by the range of polychaete and bivalve fauna present. This biotope is notable for the presence of the rarely recorded ampharetid polychaete [Amythasides macroglossus] and also for the small ear file clam [Limatula subauriculata] which is common in some examples of this biotope.
21.2. *Hesionura elongata* and *Protodorvillea kefersteini* in offshore coarse sand. SS.SCS.OCS.HeloPkef	Offshore (deep) circalittoral habitats with coarse sand may support populations of the interstitial polychaete *Hesionura elongata* with *Protodorvillea kefersteini.* Other notable species include the phyllodocid polychaete *Protomystides limbata*and the bivalve *Moerella pygmaea*. This biotope was reported in the offshore northern North Sea by Eleftheriou and Basford (1989). Relatively little data exists for this biotope.
21.3. *Echinocyamus pusillus*, *Ophelia borealis* and *Abra prismatica* in circalittoral fine sand. SS.SSa.CFiSa.EpusOborApri	Circalittoral and offshore medium to fine sand (from 40m to 140m) characterised by the pea urchin *Echinocyamus pusillus*, the polychaete *Ophelia borealis* and the bivalve *Abra prismatica*. Other species may include the polychaetes*Spiophanes bombyx*, *Pholoe* sp., *Exogone* spp., *Sphaerosyllis bulbosa*, *Goniada maculata*, *Chaetozone setosa*, *Owenia fusiformis, Glycera lapidum, Lumbrineris latreilli* and *Aricidea cerrutii* and the bivalves *Thracia phaseolina* and *Moerella pygmaea* and to a lesser extent *Spisula elliptica and Timoclea ovata*. This biotope has been found in the central and northern North Sea.
21.4. *Abra prismatica*, *Bathyporeia elegans* and polychaetes in circalittoral fine sand.	In circalittoral and offshore medium to fine sands between 25m and 100m a community characterised by the bivalve *Abra prismatica,* the amphipod *Bathyporeia elegans* and

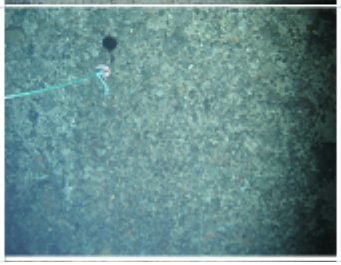
SS.SSa.CFiSa.ApriBatPo	polychaetes such as *Scoloplos armiger*, *Spiophanes bombyx*,*Aonides paucibranchiata*, *Chaetozone setosa, Ophelia borealis* and *Nephtys longosetosa* may be found. Crustacea such as the cumacean *Eudorellopsis deformis* and the opheliid polychaetes such as *Ophelia borealis*, *Travisia forbesii* or*Ophelina neglecta* are often present in this biotope and the brittlestar *Amphiura filiformis* may also be common at some sites. This biotope has been reported in the central and northern North Sea (Basford and Eleftheriou, 1989; K et al., 1992).
21.5. Maldanid polychaetes and *Eudorellopsis deformis* in offshore circalittoral sand or muddy sand. SS.SSa.OSa.MalEdef	In deep offshore sand or non-cohesive muddy sand dense populations of maldanid polychaetes such as *Maldane sarsi*and the cumacean *Eudorellopsis deformis* may be found. Accompanying these species are abundant ophiuroids including *Amphiura filiformis*, polychaetes such as Terebellidae sp., *Chaetozone setosa*, *Levinsenia gracilis*, *Scoloplos armiger*, the amphipod *Harpinia antennaria* and the bivalves *Nuculoma tenuis* and *Parvicardium minimum*. This biotope is similar to the *Maldane sarsi-Ophiura sarsi* community defined by Glemarec (1973).
21.6. *Owenia fusiformis* and *Amphiura filiformis* in offshore circalittoral sand or muddy sand. SS.SSa.OSa.OfusAfil	Areas of slightly muddy sand (generally <20% mud) in offshore waters may be characterised by high numbers of the tube building polychaete *Owenia fusiformis* often with the brittlestar *Amphiura filiformis*. Whilst *O. fusiformis* is also found in other circalittoral or offshore biotopes it usually occurs in lower abundances than in SSA.OfusAfil. Other species found in this community are the polychaetes *Goniada maculata*, *Pholoe inornata*, *Diplocirrus glaucus*, *Chaetozone setosa* and*Spiophanes kroyeri* with occasional bivalves such as *Timoclea ovata* and *Thyasira equalis*. The sea cucumber *Labidoplax buski* and the cumacean *Eudorella truncatula* are also commonly often found in this biotope.
22. **Seamount communities (Offshore Waters).**	
Low or limited mobility species being used to underpin the selection of Nature Conservation MPAs. (Offshore Waters).	
23. Northern feather star aggregations on mixed substrata - *Leptometra celtica*	Commonly found on sediment, shell, gravel or bedrock from 40 to 200m depth, it can on occasions form very dense aggregations on the sea bed. The majority of records from the UK are from the west and north coasts of Scotland and Shetland. See above for photo.
24. Fan mussel aggregations - *Atrina fragilis*	Lives embedded in lower intertidal and sub-tidal muds, sandy muds or gravels. Large (30-48 cm long) triangular, thin, shell tapering to a point, light yellow- brown to dark brown in colour. Fan-mussels live with their pointed end embedded in sediment, attached by abundant fine byssal threads. The posterior (broad) end protrudes from the surface. Often solitary but populations occur as small groups or patches of individuals forming small beds.
25. Ocean quahog aggregations - *Arctica islandica*	*Arctica islandica* is found at extreme low water level but predominately on sub-littoral firm sediments including level offshore areas, buried (or part buried) in sand and muddy sand that ranges from fine to coarse grains. *Arctica islandica* has a heavy, thick, oval to rounded shell up to 13cm in length. The shell is sculptured with numerous fine concentric lines and the beaks are anterior. It has a thick glossy periostracum that is brown in smaller individuals,

	becoming greenish-brown to black in larger specimens. The periostracum peels away on dead shells, revealing a white to pale brown shell beneath.
Mobile species being used to underpin the selection of Nature Conservation MPAs. (Offshore Waters).	
26. Blue ling - *Molva dypterygia*	The blue ling is a demersal species usually found on the continental slopes at depths between 300-500m, often on muddy bottoms. *Molva dypterygia* is a member of the cod-like family. It has a very elongate slender body, up to 1.5m in length, and a small and narrow head. It has two dorsal fins, the first of which is short, the second is long and runs continuously from the beginning of the tail fin to two thirds of the body length. The anal fin is also long and continuous but shorter than the dorsal fin. The tail fin is concave to rounded in shape. The upper body is grey-brown in colour, grading to white underneath.
27. Orange roughy - *Hoplostethus atlanticus*	The orange roughy is a bathypelagic species, inhabiting deep, cold waters over steep continental slopes from 150m to over 1800m depth. The orange roughy *Hoplostethus atlanticus* is a member of the slimehead family. It has a deep and compressed body that may reach up to 75 cm in length. It has a large head with an oblique mouth and large eyes. Its dorsal fin is moderately long and has spines at the anterior end. Its tail is slender and forked with spines on each lobe. A median ridge of scutes is present on the abdomen. Alive, it is bright brick red in colour but fades to a yellowish orange after death.
28. Sandeels - Ammodytes	*Ammodytes marinus* is a schooling bentho-pelagic species, which may congregate in large schools near the surface or bury itself in sand. It may be found both inshore and offshore. *Ammodytes marinus* is a thin and elongated sand eel with a pointed jaw. It can reach a maximum length of 25cm. Its dorsal colouring is usually dark green, while the ventral and lateral sides are silvery in colour. There is a single long dorsal fin, and the anal fin is half the length of the dorsal fin. The tail fin is small and distinctively forked. The lower jaw is distinctly longer than the upper jaw. *Ammodytes tobianus* is found from mid-tide level over sandy shores to the shallow sublittoral to depths of 30 metres. They bury themselves 20-50cm deep in the sand during the winter. *Ammodytes tobianus* is the most abundant species of sand eel found in British waters. It has been reported to spawn in spring and summer (Dipper, 2001) or spring and autumn (FishBase, 2000). Eggs are laid in the sand where they adhere to the sand grains. Each female produces 4000-20,000 eggs, which hatch after a few weeks. Their diet consists of zooplankton and some large diatoms as well as worms, small crustaceans and small fish. They swim in schools with heads down and dart into the sand immediately on sign of danger.
29. **Annex I Reef Habitats.** Reefs can be either biogenic concretions or of geogenic origin. They are hard compact substrata on solid and soft bottoms, which arise from the sea floor in the sublittoral and littoral zone. Reefs may support a zonation of benthic communities of algae and animal species as well as concretions and corallogenic concretions. • Arise from the sea floor means: the reef is topographically distinct from the surrounding seafloor.	

Such hard substrata that are covered by a thin and mobile veneer of sediment are classed as reefs if the associated biota are dependent on the hard substratum rather than the overlying sediment.
Hard compact substrata are: rocks (including soft rock, e.g. chalk), boulders and cobbles (generally >64mm in diameter)
Biogenic concretions are defined as: concretions, encrustations, corallogenic concretions and bivalve mussel beds originating from dead or living animals, i.e. biogenic hard bottoms which supply habitats for epibiotic species.
Geogenic reefs are formed by non biogenic substrata.
A variety of subtidal topographic features are included in this habitat complex such as: Hydrothermal vent habitats, sea mounts, vertical rock walls, horizontal ledges, overhangs, pinnacles, gullies, ridges, sloping or flat bed rock, broken rock and boulder and cobble fields.

Appendix 3 – Representative images of habitats found on the Wyville Thomson Ridge SCI on 2012 surveys, together with detail on characterising and dominant species and average species richness per image of tow.

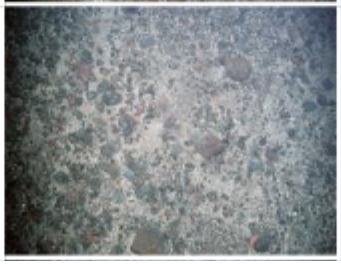
All example images for individual tows and biotopes have been provided to JNCC as separate files (See Appendix 5 for detail).

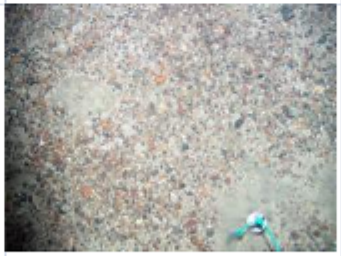
Video Habitat (Sample)	Eunis Habitat: Level 3	Eunis Habitat: Level 4	Broad Habitat Type	Habitat Names present	Typical Image(s)	Position start / point	Position End	Approx depth (m bsl)	Average species richness per 1.6m2	Standard error	Max Taxa Richness observed in one sample
20121028_WTR_VTR1_Hab1	Deep-sea mixed substrata (A6.2)		Low Quality Reef	Bathyal Low Quality stony reef with very sparse epifauna, Bathyal mixed substrates dominated by coarse sediments with no evidence of epifauna		59.9387 - 6.0631	59.933833 - 6.077833	336	5.23	0.33	8
20121028_WTR_VTR1 VHab2	Deep-sea mixed substrata (A6.2)		Low Quality Reef	Bathyal Low Quality stony reef with very sparse epifauna, Bathyal mixed substrates dominated by coarse sediments with no evidence of epifauna		59.9337 - 6.077983	59.93315 - 6.0799	337	*calculated for whole tow*		
20121028 WTR_VTR2_Hab1	Deep-sea mixed substrata (A6.2)		Bathyal Mixed Substrates	Bathyal Low Quality stony reef with very sparse epifauna, Bathyal mixed substrates dominated by coarse sediments with no evidence of epifauna		59.923016 - 6.037066	59.923966 - 6.048333	348	5.17	0.87	8
20121028_WTR_VTR3 Hab1	Deep-sea mixed substrata (A6.2)		Bathyal Mixed Substrates	Bathyal Low Quality stony reef with very sparse epifauna, Bathyal mixed substrates dominated by coarse sediments with no evidence of epifauna, Bathyal mixed substrates dominated by coarse sediments with very sparse epifauna		59.9831 - 6.051866	59.98665 - 6.059016	340	8.40	1.83	12

Video Habitat (Sample)	Eunis Habitat: Level 3	Eunis Habitat: Level 4	Broad Habitat Type	Habitat Names present	Typical Image(s)	Position start / point	Position End	Approx depth (m bsl)	Average species richness per 1.6m2	Standard error	Max Taxa Richness observed in one sample
20121101_WTR_VTR4_Hab1	Deep-sea mixed substrata (A6.2)		Bathyal Mosaics	Mosaic of Bathyal mixed substrates and low quality stony reef		59.864833 -6.151333	59.861566 -6.147583	900	*4.00*	*1.22*	*5*
20121101_WTR_VTR4_Hab2	Deep-sea mixed substrata (A6.2)		Bathyal Mosaics	Mosaic of Bathyal mixed substrates and low quality stony reef		59.861216 -6.1471	59.860533 -6.145583	902	*calculated for whole tow*		
20121101_WTR_VTR5_Hab1	Deep-sea mixed substrata (A6.2)		Bathyal Mixed Substrates	Bathyal Low Quality stony reef with Serpulids & Cnidarians, Bathyal Low Quality stony reef with very sparse epifauna, Bathyal mixed substrates dominated by coarse sediments with no evidence of epifauna		59.91145 -6.053316	59.906866 -6.054016	356	6.20	1.50	10
20121101_WTR_VTR6 Hab1	Deep-sea mixed substrata (A6.2)		Low Quality Reef	Bathyal Low Quality stony reef with Porifera, Bathyal Low Quality stony reef with very sparse epifauna, Bathyal mixed substrates dominated by coarse sediments with no evidence of epifauna, Bathyal mixed substrates dominated by coarse sediments with very sparse epifauna, Insufficient image quality to determine species or sediment composition		59.904483 -6.065166	59.9008 -6.059716	427	6.02	0.56	14
20121101_WTR_VTR7_Hab1	Deep-sea mixed substrata (A6.2)		Bathyal Mixed Substrates	Bathyal Low Quality stony reef with Serpulids & encrusting sponge, Bathyal Low Quality stony reef with very sparse epifauna, Bathyal mixed substrates dominated by coarse sediments with no evidence of epifauna, Bathyal mixed substrates dominated by coarse sediments with very sparse epifauna		59.913166 -6.091116	59.91045 -6.08265	394	6.80	1.43	

Video Habitat (Sample)	Eunis Habitat: Level 3	Eunis Habitat: Level 4	Broad Habitat Type	Habitat Names present	Typical Image(s)	Position start / point	Position End	Approx depth (m bsl)	Average species richness per 1.6m2	Standard error	Max Taxa Richness observed in one sample
20121101_WTR_VTR8_Hab 1	Deep-sea mixed substrata (A5.2)		Bathyal Mixed Substrates	Bathyal mixed substrates dominated by coarse sediments with no evidence of epifauna, Bathyal mixed substrates dominated by coarse sediments with Porifera, Bathyal mixed substrates dominated by coarse sediments with very sparse epifauna, Deep-sea mixed substrata		59.899883 -6.636683	59.895883 -6.633566	623	4.48	0.43	11
20121101_WTR_VTR9_Hab1	Deep-sea mixed substrata (A5.2)		Bathyal Mixed Substrates	Bathyal mixed substrates dominated by coarse sediments with no evidence of epifauna, Bathyal mixed substrates dominated by coarse sediments with very sparse epifauna		59.875333 -6.090583	59.870983 -6.08655	863	3.17	0.87	7
20121101_WTR_VTR10_Hab1	Deep-sea mixed substrata (A5.2)		Bathyal Mixed Substrates	Bathyal Low Quality stony reef with very sparse epifauna, Bathyal mixed substrates dominated by coarse sediments with no evidence of epifauna, Bathyal mixed substrates dominated by coarse sediments with very sparse epifauna		59.885766 -6.1169	59.88105 -6.117216	821	5.20	0.58	6
20121101_WTR_VTR11_Hab1	Deep-sea mixed substrata (A5.2)		Bathyal Mosaics	Bathyal Low Quality stony reef with very sparse epifauna, Bathyal mixed substrates dominated by coarse sediments with no evidence of epifauna, Bathyal mixed substrates dominated by coarse sediments with very sparse epifauna		59.906133 -6.07145	59.868683 -6.067583	686	4.25	0.48	5

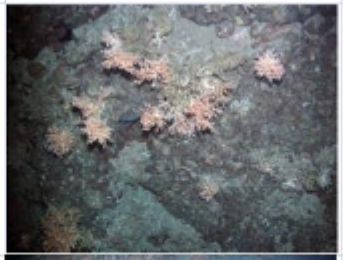
Video Habitat (Sample)	Eunis Habitat: Level 3	Eunis Habitat: Level 4	Broad Habitat Type	Habitat Names present	Typical Image(s)	Position start / point	Position End	Approx depth (m bsl)	Average species richness per 1.6m2	Standard error	Max Taxa Richness observed in one sample
20121101_WTR_VTR12 Hab1	Deep-sea mixed substrata (A6.2)		Bathyal Mosaics	Bathyal Low Quality stony reef with no evidence of epifauna, Bathyal Low Quality stony reef with Porifera, Bathyal Low Quality stony reef with Porifera and Cnidaria, Bathyal Low Quality stony reef with very sparse epifauna, Bathyal mixed substrates dominated by coarse sediments with no evidence of epifauna, Bathyal mixed substrates dominated by coarse sediments with very sparse epifauna		59.9461 -6.04445	59.940833 -6.045566	471	6.55	0.60	21
20121101_WTR_VTR13_Hab1	Deep-sea mixed substrata (A6.2)		Bathyal Mosaics	Bathyal Low Quality stony reef with very sparse epifauna, Bathyal mixed substrates dominated by coarse sediments with no evidence of epifauna, Bathyal mixed substrates dominated by coarse sediments with very sparse epifauna		59.935983 -6.150816	59.932533 -6.160166	355	4.91	0.46	12
20121101_WTR_VTR14_Hab1	Deep-sea mixed substrata (A6.2)		Bathyal Mosaics	Bathyal Low Quality stony reef with Porifera, Bathyal Low Quality stony reef with Serpulids , Bathyal Low Quality stony reef with Serpulids & encrusting sponge, Bathyal Low Quality stony reef with very sparse epifauna		59.909616 -6.10025	59.906266 -6.1065	484	10.91	0.54	19
20121102_WTR_VTR15 Hab1	Deep-sea mixed substrata (A6.2)		Bathyal Mosaics	Bathyal Low Quality stony reef with no evidence of epifauna, Bathyal Low Quality stony reef with Porifera, Bathyal Low Quality stony reef with Serpulids & encrusting sponge, Bathyal Low Quality stony reef with very sparse epifauna, Bathyal mixed substrates dominated by coarse sediments with no evidence of epifauna, Bathyal mixed substrates dominated by coarse sediments with Porifera, Bathyal mixed substrates		59.923933 -6.1425	59.920416 -6.148016	441	9.15	0.61	17

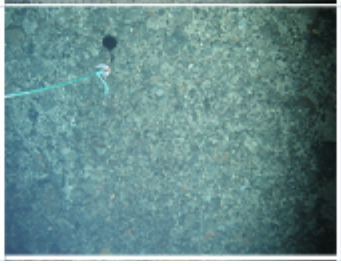
Video Habitat (Sample)	Eunis Habitat: Level 3	Eunis Habitat: Level 4	Broad Habitat Type	Habitat Names present	Typical Image(s)	Position start / point	Position End	Approx depth (m bsl)	Average species richness per 1.6m2	Standard error	Max Taxa Richness observed in one sample
20121102_WTR_VTR16 Hab 1	Deep-sea mixed substrata (A5.2)		Bathyal Mosaics	Bathyal Low Quality stony reef with Porifera, Bathyal Low Quality stony reef with very sparse epifauna, Bathyal mixed substrates dominated by coarse sediments with Porifera, Bathyal mixed substrates dominated by coarse sediments with very sparse epifauna		59.918216 - 6.001333	59.914966 -6.011433	546	5.77	0.31	14
20121102_WTR_VTR17 Hab1	Deep-sea mixed substrata (A5.2)		Bathyal Mixed Substrates	Bathyal mixed substrates dominated by coarse sediments with very sparse epifauna		59.938366 - 6.0782	59.93375 - 6.076733	554	6.60	0.40	8
20121102_WTR_VTR18 Hab1	Deep-sea mixed substrata (A5.2)		Bathyal Mixed Substrates	Bathyal Low Quality stony reef with Serpulids & encrusting sponge, Bathyal Low Quality stony reef with very sparse epifauna, Bathyal mixed substrates dominated by coarse sediments with very sparse epifauna		59.954183 - 6.035816	59.9582 - 6.0387	376	8.25	0.86	11
20121102_WTR_VTR19_VHab1	Deep-sea mixed substrata (A5.2)		Bathyal Mixed Substrates	Bathyal Low Quality stony reef with very sparse epifauna, Bathyal mixed sediment, very sparse epifuana		59.983866 - 6.077983	59.988416 -6.080666	373	7.33	1.01	13

Video Habitat (Sample)	Eunis Habitat: Level 3	Eunis Habitat: Level 4	Broad Habitat Type	Habitat Names present	Typical Image(s)	Position start / point	Position End	Approx depth (m bsl)	Average species richness per 1.6m2	Standard error	Max Taxa Richness observed in one sample
20121102_WTR_VTR20_VHab1	Deep-sea mixed substrata (A5.2)		Bathyal Mosaics	Bathyal Low Quality stony reef with Porifera, Bathyal Low Quality stony reef with Porifera & Cnidaria, Bathyal mixed sediment, very sparse epifuana		59.98805 -6.127	59.9927 - 6.127	433	8.44	2.31	20
20121102_WTR_VTR21_VHab1	Deep-sea mixed substrata (A5.2)		Bathyal Mixed Substrates	Bathyal Low Quality stony reef with very sparse epifauna, Bathyal mixed sediment with sparse epifana, Bathyal mixed sediment, very sparse epifauna		59.97945 - 6.142083	59.980783 -6.80885	490	*9.26*	*1.00*	23
20121102_WTR_VTR21_VHab2	Deep-sea mixed substrata (A5.2)		Low Quality Reef	Bathyal Low Quality stony reef with very sparse epifauna		59.980783 - 6.80885	59.9838 - 6.140683	479	*calculated for whole tow*		

Video Habitat (Sample)	Eunis Habitat: Level 3	Eunis Habitat: Level 4	Broad Habitat Type	Habitat Names present	Typical Image(s)	Position start / point	Position End	Approx depth (m bsl)	Average species richness per 1.6m2	Standard error	Max Taxa Richness observed in one sample
20121102_WTR_VTR22 VHab1	Deep-sea mixed substrata (A6.2)		Bathyal Mixed Substrates	Bathyal mixed sediment, very sparse epifauna		59.969 -6.01465	59.9738 -6.0105	609	4.60	0.51	6
20121102_WTR_VTR23 VHab1	Deep-sea mixed substrata (A6.2)		Bathyal Mixed Substrates	Bathyal mixed substrates dominated by coarse sediments with very sparse epifauna		59.9645 -6.01935	59.960566 -6.024916	605	3.39	0.27	7
20121102_WTR_VTR24_VHab 1	Deep-sea mixed substrata (A6.2)		Bathyal Mixed Substrates	Bioturbated bathyal mixed sediment, very sparse epifauna.		59.942616 -6.06495	59.941433 -6.073933	685	4.33	0.49	6
20121102_WTR_VTR25 VHab1	Deep-sea mixed substrata (A6.2)		Bathyal Mixed Substrates	Bathyal mixed sediment, sparse epifauna		59.9185 -6.063333	59.9144 -6.06785	775	9.33	0.42	11

Video Habitat (Sample)	Eunis Habitat: Level 3	Eunis Habitat: Level 4	Broad Habitat Type	Habitat Names present	Typical Image(s)	Position start / point	Position End	Approx depth (m bsl)	Average species richness per 1.6m2	Standard error	Max Taxa Richness observed in one sample
20121102_WTR_VTR25 VHab1	Deep-sea mixed substrata (A5.2)		Bathyal Mixed Substrates	Bathyal mixed sediment, sparse epifauna		59.9185 -6.063333	59.9144 -6.06785	775	9.33	0.42	11
20121102_WTR_VTR26_VHab 1	Deep-sea mixed substrata (A5.2)		Bathyal Mixed Substrates	Bathyal mixed sediment, very sparse epifauna		59.927983 -6.093333	59.924516 -6.098733	749	8.06	0.44	14
20121102WTR_VTR27b V Hab 1	Deep-sea mixed substrata (A5.2)		Bathyal Mixed Substrates	Bathyal mixed sediment, very sparse epifauna		59.945166 -6.144316	59.948066 -6.136616	597	4.40	0.87	7
20121102 WTR_VTR28 V Hab 1	Deep-sea rock and artificial hard substrata (A6.1)	Boulders on the deep-sea bed (A6.14)	Potential Annex 1 Reef	Bathyal Potential Annex 1 stony reef with Lophelia +/- Madrepora & Porifera		59.87065 -6.106783	59.86945 -6.110333	655	11.51	0.52	19

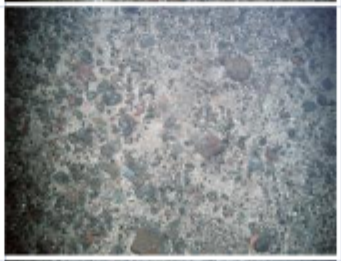
Video Habitat (Sample)	Eunis Habitat: Level 3	Eunis Habitat: Level 4	Broad Habitat Type	Habitat Names present	Typical Image(s)	Position start / point	Position End	Approx depth (m bsl)	Average species richness per 1.6m2	Standard error	Max Taxa Richness observed in one sample
20121102 WTR_VTR28 V Hab 2	Deep-sea rock and artificial hard substrata (A5.1)	Boulders on the deep-sea bed (A6.14)	Annex 1 Reef	Bathyal Annex 1 stony reef with Lophelia +/- Madrepora & Porifera crusts		59.869433 - 6.11035	59.86695 - 6.11515	723	*calculated for whole tow*		
20121102WTR_ VTR29 V Hab 1	Deep-sea rock and artificial hard substrata (A5.1)	Boulders on the deep-sea bed (A6.14)	Annex 1 Reef	Bathyal Annex 1 stony reef with Porifera, Cnidaria & Echinoderms		59.87075 - 5.951483	59.867133 -5.957283	701	17.91	0.64	25

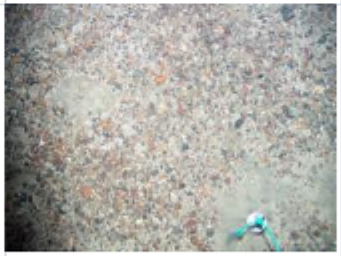
Video Habitat (Sample)	Eunis Habitat: Level 3	Eunis Habitat: Level 4	Broad Habitat Type	Habitat Names present	Typical Image(s)	Position start / point	Position End	Approx depth (m bsl)	Average species richness per 1.6m2	Standard error	Max Taxa Richness observed in one sample
20121028_WTR_VTR1_Hab1	Deep-sea mixed substrata (A6.2)		Low Quality Reef	Bathyal Low Quality stony reef with very sparse epifauna, Bathyal mixed substrates dominated by coarse sediments with no evidence of epifauna		59.9387 - 6.0631	59.933833 - 6.077833	336	5.23	0.33	8
20121028_WTR_VTR1 VHab2	Deep-sea mixed substrata (A6.2)		Low Quality Reef	Bathyal Low Quality stony reef with very sparse epifauna, Bathyal mixed substrates dominated by coarse sediments with no evidence of epifauna		59.9337 - 6.077983	59.93315 - 6.0799	337	*calculated for whole tow*		
20121028 WTR_VTR2_Hab1	Deep-sea mixed substrata (A6.2)		Bathyal Mixed Substrates	Bathyal Low Quality stony reef with very sparse epifauna, Bathyal mixed substrates dominated by coarse sediments with no evidence of epifauna		59.923016 - 6.037066	59.923966 - 6.048333	348	5.17	0.87	8
20121028_WTR_VTR3 Hab1	Deep-sea mixed substrata (A6.2)		Bathyal Mixed Substrates	Bathyal Low Quality stony reef with very sparse epifauna, Bathyal mixed substrates dominated by coarse sediments with no evidence of epifauna, Bathyal mixed substrates dominated by coarse sediments with very sparse epifauna		59.9831 - 6.051866	59.98665 - 6.059016	340	8.40	1.83	12

Video Habitat (Sample)	Eunis Habitat: Level 3	Eunis Habitat: Level 4	Broad Habitat Type	Habitat Names present	Typical Image(s)	Position start / point	Position End	Approx depth (m bsl)	Average species richness per 1.6m2	Standard error	Max Taxa Richness observed in one sample
20121101_WTR_VTR4_Hab1	Deep-sea mixed substrata (A6.2)		Bathyal Mosaics	Mosaic of Bathyal mixed substrates and low quality stony reef		59.864833 -6.151333	59.861566 -6.147583	900	*4.00*	*1.22*	*5*
20121101_WTR_VTR4_Hab2	Deep-sea mixed substrata (A6.2)		Bathyal Mosaics	Mosaic of Bathyal mixed substrates and low quality stony reef		59.861216 -6.1471	59.860533 -6.145583	902	*calculated for whole tow*		
20121101_WTR_VTR5_Hab1	Deep-sea mixed substrata (A6.2)		Bathyal Mixed Substrates	Bathyal Low Quality stony reef with Serpulids & Cnidarians, Bathyal Low Quality stony reef with very sparse epifauna, Bathyal mixed substrates dominated by coarse sediments with no evidence of epifauna		59.91145 -6.053316	59.906866 -6.054016	356	6.20	1.50	10
20121101_WTR_VTR6 Hab1	Deep-sea mixed substrata (A6.2)		Low Quality Reef	Bathyal Low Quality stony reef with Porifera, Bathyal Low Quality stony reef with very sparse epifauna, Bathyal mixed substrates dominated by coarse sediments with no evidence of epifauna, Bathyal mixed substrates dominated by coarse sediments with very sparse epifauna, Insufficient image quality to determine species or sediment composition		59.904483 -6.065166	59.9008 -6.059716	427	6.02	0.56	14
20121101_WTR_VTR7_Hab1	Deep-sea mixed substrata (A6.2)		Bathyal Mixed Substrates	Bathyal Low Quality stony reef with Serpulids & encrusting sponge, Bathyal Low Quality stony reef with very sparse epifauna, Bathyal mixed substrates dominated by coarse sediments with no evidence of epifauna, Bathyal mixed substrates dominated by coarse sediments with very sparse epifauna		59.913166 -6.091116	59.91045 -6.08265	394	6.80	1.43	

Video Habitat (Sample)	Eunis Habitat: Level 3	Eunis Habitat: Level 4	Broad Habitat Type	Habitat Names present	Typical Image(s)	Position start / point	Position End	Approx depth (m bsl)	Average species richness per 1.6m2	Standard error	Max Taxa Richness observed in one sample
20121101_WTR_VTR8_Hab 1	Deep-sea mixed substrata (A5.2)		Bathyal Mixed Substrates	Bathyal mixed substrates dominated by coarse sediments with no evidence of epifauna, Bathyal mixed substrates dominated by coarse sediments with Porifera, Bathyal mixed substrates dominated by coarse sediments with very sparse epifauna, Deep-sea mixed substrata		59.899883 -6.636683	59.895883 -6.633566	623	4.48	0.43	11
20121101_WTR_VTR9_Hab1	Deep-sea mixed substrata (A5.2)		Bathyal Mixed Substrates	Bathyal mixed substrates dominated by coarse sediments with no evidence of epifauna, Bathyal mixed substrates dominated by coarse sediments with very sparse epifauna		59.875333 -6.090583	59.870983 -6.08655	863	3.17	0.87	7
20121101_WTR_VTR10_Hab1	Deep-sea mixed substrata (A5.2)		Bathyal Mixed Substrates	Bathyal Low Quality stony reef with very sparse epifauna, Bathyal mixed substrates dominated by coarse sediments with no evidence of epifauna, Bathyal mixed substrates dominated by coarse sediments with very sparse epifauna		59.885766 -6.1169	59.88105 -6.117216	821	5.20	0.58	6
20121101_WTR_VTR11_Hab1	Deep-sea mixed substrata (A5.2)		Bathyal Mosaics	Bathyal Low Quality stony reef with very sparse epifauna, Bathyal mixed substrates dominated by coarse sediments with no evidence of epifauna, Bathyal mixed substrates dominated by coarse sediments with very sparse epifauna		59.906133 -6.07145	59.868683 -6.067583	686	4.25	0.48	5

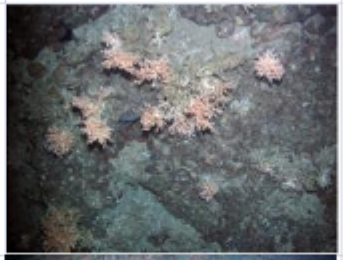
Video Habitat (Sample)	Eunis Habitat: Level 3	Eunis Habitat: Level 4	Broad Habitat Type	Habitat Names present	Typical Image(s)	Position start / point	Position End	Approx depth (m bsl)	Average species richness per 1.6m2	Standard error	Max Taxa Richness observed in one sample
20121101_WTR_VTR12 Hab1	Deep-sea mixed substrata (A6.2)		Bathyal Mosaics	Bathyal Low Quality stony reef with no evidence of epifauna, Bathyal Low Quality stony reef with Porifera, Bathyal Low Quality stony reef with Porifera and Cnidaria, Bathyal Low Quality stony reef with very sparse epifauna, Bathyal mixed substrates dominated by coarse sediments with no evidence of epifauna, Bathyal mixed substrates dominated by coarse sediments with very sparse epifauna		59.9461 -6.04445	59.940833 -6.045566	471	6.55	0.60	21
20121101_WTR_VTR13_Hab1	Deep-sea mixed substrata (A6.2)		Bathyal Mosaics	Bathyal Low Quality stony reef with very sparse epifauna, Bathyal mixed substrates dominated by coarse sediments with no evidence of epifauna, Bathyal mixed substrates dominated by coarse sediments with very sparse epifauna		59.935983 -6.150816	59.932533 -6.160166	355	4.91	0.46	12
20121101_WTR_VTR14_Hab1	Deep-sea mixed substrata (A6.2)		Bathyal Mosaics	Bathyal Low Quality stony reef with Porifera, Bathyal Low Quality stony reef with Serpulids , Bathyal Low Quality stony reef with Serpulids & encrusting sponge, Bathyal Low Quality stony reef with very sparse epifauna		59.909616 -6.10025	59.906266 -6.1065	484	10.91	0.54	19
20121102_WTR_VTR15 Hab1	Deep-sea mixed substrata (A6.2)		Bathyal Mosaics	Bathyal Low Quality stony reef with no evidence of epifauna, Bathyal Low Quality stony reef with Porifera, Bathyal Low Quality stony reef with Serpulids & encrusting sponge, Bathyal Low Quality stony reef with very sparse epifauna, Bathyal mixed substrates dominated by coarse sediments with no evidence of epifauna, Bathyal mixed substrates dominated by coarse sediments with Porifera, Bathyal mixed substrates		59.923933 -6.1425	59.920416 -6.148016	441	9.15	0.61	17

Video Habitat (Sample)	Eunis Habitat: Level 3	Eunis Habitat: Level 4	Broad Habitat Type	Habitat Names present	Typical Image(s)	Position start / point	Position End	Approx depth (m bsl)	Average species richness per 1.6m2	Standard error	Max Taxa Richness observed in one sample
20121102_WTR_VTR16 Hab 1	Deep-sea mixed substrata (A5.2)		Bathyal Mosaics	Bathyal Low Quality stony reef with Porifera, Bathyal Low Quality stony reef with very sparse epifauna, Bathyal mixed substrates dominated by coarse sediments with Porifera, Bathyal mixed substrates dominated by coarse sediments with very sparse epifauna		59.918216 - 6.001333	59.914966 -6.011433	546	5.77	0.31	14
20121102_WTR_VTR17 Hab1	Deep-sea mixed substrata (A5.2)		Bathyal Mixed Substrates	Bathyal mixed substrates dominated by coarse sediments with very sparse epifauna		59.938366 - 6.0782	59.93375 - 6.076733	554	6.60	0.40	8
20121102_WTR_VTR18 Hab1	Deep-sea mixed substrata (A5.2)		Bathyal Mixed Substrates	Bathyal Low Quality stony reef with Serpulids & encrusting sponge, Bathyal Low Quality stony reef with very sparse epifauna, Bathyal mixed substrates dominated by coarse sediments with very sparse epifauna		59.954183 - 6.035816	59.9582 - 6.0387	376	8.25	0.86	11
20121102_WTR_VTR19_VHab1	Deep-sea mixed substrata (A5.2)		Bathyal Mixed Substrates	Bathyal Low Quality stony reef with very sparse epifauna, Bathyal mixed sediment, very sparse epifuana		59.983866 - 6.077983	59.988416 -6.080666	373	7.33	1.01	13

Video Habitat (Sample)	Eunis Habitat: Level 3	Eunis Habitat: Level 4	Broad Habitat Type	Habitat Names present	Typical Image(s)	Position start / point	Position End	Approx depth (m bsl)	Average species richness per 1.6m2	Standard error	Max Taxa Richness observed in one sample
20121102_WTR_VTR20_VHab1	Deep-sea mixed substrata (A5.2)		Bathyal Mosaics	Bathyal Low Quality stony reef with Porifera, Bathyal Low Quality stony reef with Porifera & Cnidaria, Bathyal mixed sediment, very sparse epifuana		59.98805 -6.127	59.9927 - 6.127	433	8.44	2.31	20
20121102_WTR_VTR21_VHab1	Deep-sea mixed substrata (A5.2)		Bathyal Mixed Substrates	Bathyal Low Quality stony reef with very sparse epifauna, Bathyal mixed sediment with sparse epifana, Bathyal mixed sediment, very sparse epifauna		59.97945 - 6.142083	59.980783 -6.80885	490	*9.26*	*1.00*	23
20121102_WTR_VTR21_VHab2	Deep-sea mixed substrata (A5.2)		Low Quality Reef	Bathyal Low Quality stony reef with very sparse epifauna		59.980783 - 6.80885	59.9838 - 6.140683	479	*calculated for whole tow*		

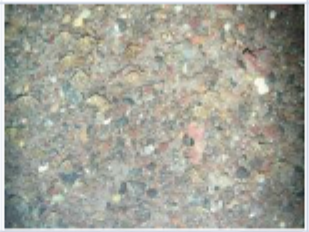
Video Habitat (Sample)	Eunis Habitat: Level 3	Eunis Habitat: Level 4	Broad Habitat Type	Habitat Names present	Typical Image(s)	Position start / point	Position End	Approx depth (m bsl)	Average species richness per 1.6m2	Standard error	Max Taxa Richness observed in one sample
20121102_WTR_VTR22 VHab1	Deep-sea mixed substrata (A6.2)		Bathyal Mixed Substrates	Bathyal mixed sediment, very sparse epifauna		59.969 -6.01465	59.9738 -6.0105	609	4.60	0.51	6
20121102_WTR_VTR23 VHab1	Deep-sea mixed substrata (A6.2)		Bathyal Mixed Substrates	Bathyal mixed substrates dominated by coarse sediments with very sparse epifauna		59.9645 -6.01935	59.960566 -6.024916	605	3.39	0.27	7
20121102_WTR_VTR24_VHab 1	Deep-sea mixed substrata (A6.2)		Bathyal Mixed Substrates	Bioturbated bathyal mixed sediment, very sparse epifauna.		59.942616 -6.06495	59.941433 -6.073933	685	4.33	0.49	6
20121102_WTR_VTR25 VHab1	Deep-sea mixed substrata (A6.2)		Bathyal Mixed Substrates	Bathyal mixed sediment, sparse epifauna		59.9185 -6.063333	59.9144 -6.06785	775	9.33	0.42	11

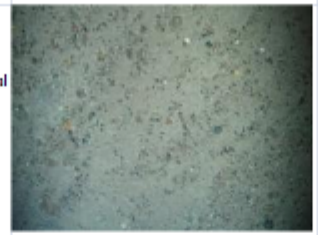
Video Habitat (Sample)	Eunis Habitat: Level 3	Eunis Habitat: Level 4	Broad Habitat Type	Habitat Names present	Typical Image(s)	Position start / point	Position End	Approx depth (m bsl)	Average species richness per 1.6m2	Standard error	Max Taxa Richness observed in one sample
20121102_WTR_VTR25 VHab1	Deep-sea mixed substrata (A5.2)		Bathyal Mixed Substrates	Bathyal mixed sediment, sparse epifauna		59.9185 -6.063333	59.9144 -6.06785	775	9.33	0.42	11
20121102_WTR_VTR26_VHab 1	Deep-sea mixed substrata (A5.2)		Bathyal Mixed Substrates	Bathyal mixed sediment, very sparse epifauna		59.927983 -6.093333	59.924516 -6.098733	749	8.06	0.44	14
20121102WTR_VTR27b V Hab 1	Deep-sea mixed substrata (A5.2)		Bathyal Mixed Substrates	Bathyal mixed sediment, very sparse epifauna		59.945166 -6.144316	59.948066 -6.136616	597	4.40	0.87	7
20121102 WTR_VTR28 V Hab 1	Deep-sea rock and artificial hard substrata (A6.1)	Boulders on the deep-sea bed (A6.14)	Potential Annex 1 Reef	Bathyal Potential Annex 1 stony reef with Lophelia +/- Madrepora & Porifera		59.87065 -6.106783	59.86945 -6.110333	655	11.51	0.52	19

Video Habitat (Sample)	Eunis Habitat: Level 3	Eunis Habitat: Level 4	Broad Habitat Type	Habitat Names present	Typical Image(s)	Position start / point	Position End	Approx depth (m bsl)	Average species richness per 1.6m2	Standard error	Max Taxa Richness observed in one sample
20121102 WTR_VTR28 V Hab 2	Deep-sea rock and artificial hard substrata (A5.1)	Boulders on the deep-sea bed (A6.14)	Annex 1 Reef	Bathyal Annex 1 stony reef with Lophelia +/- Madrepora & Porifera crusts		59.869433 - 6.11035	59.86695 - 6.11515	723	*calculated for whole tow*		
20121102WTR_ VTR29 V Hab 1	Deep-sea rock and artificial hard substrata (A5.1)	Boulders on the deep-sea bed (A6.14)	Annex 1 Reef	Bathyal Annex 1 stony reef with Porifera, Cnidaria & Echinoderms		59.87075 - 5.951483	59.867133 -5.957283	701	17.91	0.64	25

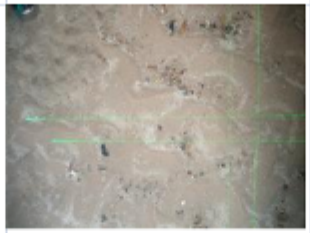
Appendix 4 – Representative images of habitats found in the Faroe-Shetland Sponge Belt Scottish Nature Conservation MPA Proposal on 2012 surveys, together with detail on characterising and dominant species and average species richness per image of tow.

All example images for individual tows and biotopes have been provided to JNCC as separate files (See Appendix 5 for detail).

Video Tow (event)	Eunis Habitat: Level 3	Broad Habitat Type	Habitat Names present in individual samples	Typical Image(s)	Position start / point	Position End	Approx. depth (m bsl)	Average taxa richness per 1.6m^2	Standard error	Max Taxa Richness observed in one image
20121102_FSC01_VHab1	Deep-sea mixed substrata (A6.2)	Low Quality Reef	Bathyal Low Quality stony reef with Echinoderms; Bathyal mixed substrates dominated by coarse sediments with Sparse epifauna; Bathyal Low Quality stony reef with Porifera		59.794266 -5.827683	59.789833 -4.8301	-538	4.68	0.39	10
20121102_FSC01_VHab2	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal mixed substrates dominated by coarse sediments with Sparse epifauna; Bathyal mixed substrates dominated by coarse sediments with echinoderms; Bathyal mixed substrates dominated by gravel and pebbles with echinoderms; Bathyal Low Quality stony reef with very sparse epifauna; Bathyal Low Quality stony reef with Echinoderms; Bathyal Low Quality stony reef with Serpulids & encrusting sponge		59.789833 -4.830116	59.7858 -5.8282	-506	*calculated for whole tow*		
20121102_FSC02_VHab1	Deep-sea mixed substrata (A6.2)	Bathyal Mosaics	Bathyal Low Quality stony reef with Echinoderms; Bathyal Potential Annex 1 stony reef with Echinoderms & Porifera; Bathyal mixed substrates dominated by gravel and pebbles with echinoderms; Bathyal mixed substrates dominated by coarse sediments with echinoderms		59.790833 -5.734066	59.782026 -5.7372	-565	7.25	0.45	17
20121102_FSC03_VHab1	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal mixed substrates dominated by coarse sediments with Sparse epifauna; Bathyal mixed substrates dominated by coarse sediments with Porifera; Bathyal Potential Annex 1 stony reef with Porifera; Bathyal Low Quality stony reef with Echinoderms		59.783266 -5.60615	59.790083 -5.5966	-446	5.06	0.45	16

Video Tow (event)	Eunis Habitat: Level 3	Broad Habitat Type	Habitat Names present in individual samples	Typical Image(s)	Position start / point	Position End	Approx. depth (m bsl)	Average taxa richness per 1.6m^2	Standard error	Max Taxa Richness observed in one image
20121103_FSC04_VHab1	Deep-sea mixed substrata (A6.2)	Bathyal Mosaics	Mosaic of Bathyal sand and mixed substrates; Mosaic of Bathyal sand and low quality stony reef; Bathyal mixed substrates dominated by coarse sediments with Sparse epifauna; Bathyal mixed substrates dominated by coarse sediments with Porifera; Bathyal rippled sand		59.836033 -5.551683	59.84325 -5.53995	-498	4.87	0.34	10
20121103_FSC05_VHab1	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal mixed substrates dominated by coarse sediments with Sparse epifauna; Bathyal sand and gravels with cobbles and pebbles		59.8756 -5.481233	59.884 -5.474116	-519	7.00	0.87	15
20121103_FSC06_VHab1	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal mixed substrates dominated by coarse sediments with Sparse epifauna; Bathyal sandy coarse sediment with cobbles and sparse sponge		59.897233 -5.3379	59.905533 -5.3303	-450	7.50	0.63	10
20121103_FSC07_VHab1	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal coarse mixed sediments with sparse cobbles and Porifera; Bathyal mixed substrates dominated by coarse sediments with Sparse epifauna		59.942333 -5.259016	59.951566 -5.2589	-481	7.64	0.47	10
20121103_FSC08_VHab1	Deep-sea sand (A6.3)	Bathyal Mosaics	Bathyal Low Quality stony reef with Serpulids & encrusting sponge; Bathyal mixed substrates dominated by coarse sediments with Sparse epifauna; Bathyal mixed substrates dominated by sand with sparse epifauna; Bathyal rippled sand; Mosaic of Bathyal sand and low quality stony reef		59.976633 -5.164666	59.968366 -5.1782	-498	5.69	0.24	12

Video Tow (event)	Eunis Habitat: Level 3	Broad Habitat Type	Habitat Names present in individual samples	Typical Image(s)	Position start / point	Position End	Approx. depth (m bsl)	Average taxa richness per 1.6m^2	Standard error	Max Taxa Richness observed in one image
20121103_FSC09_VHab1	Deep-sea mixed substrata (A6.2) & Deep Sand (A6.3)	Bathyal Mixed Substrates	Bathyal Low Quality stony reef with Porifera; Bathyal Low Quality stony reef with Serpulids & encrusting sponge; Bathyal mixed substrates dominated by coarse sediments with Porifera; Bathyal mixed substrates dominated by coarse sediments with Sparse epifauna; Bathyal mixed substrates dominated by sand and gravel		59.9618 -5.211816	59.952816 -5.2118	-499	6.09	0.24	14
20121105_FSC10_VHab1	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal mixed substrates dominated by gravel and pebbles with very sparse epifauna; Bathyal mixed substrates dominated by sand and gravel with very sparse epifauna	 	59.9033 -5.387766	59.8941 -5.386133	-509	5.50	0.28	12
20121103_FSC011_VHab1	Deep-sea sand (A5.3)	Bathyal Mixed Substrates	Bathyal mixed substrates dominated by sand with no evidence of epifauna; Bathyal mixed substrates dominated by sand with very sparse epifauna		60.004316 -5.060983	59.9952 -5.0602	-477	3.12	0.21	6
20121105_FSC12_VHab1	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal mixed sediment, sparse epifauna; Bathyal mixed sediment, very sparse epifauna		60.025483 -4.9551	60.020366 -4.9536	-437	4.97	0.61	16

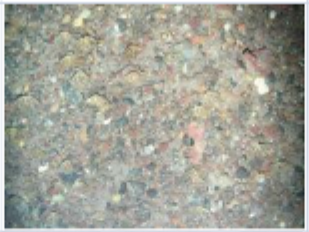
Video Tow (event)	Eunis Habitat: Level 3	Broad Habitat Type	Habitat Names present in individual samples	Typical Image(s)	Position start / point	Position End	Approx. depth (m bsl)	Average taxa richness per 1.6m^2	Standard error	Max Taxa Richness observed in one image
20121103_FSC013_VHab1	Deep-sea sand (A6.3)	Bathyal Sand	Bathyal rippled sand with no fauna; Bathyal rippled sand with very sparse epifauna		60.102883 -4.859083	60.107666 -4.8596	-527	2.66	0.25	7
20121105_FSC14_VHab1	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal mixed substrates dominated by sand with very sparse epifauna		60.117066 -4.763066	60.116866 -4.7631	-481	3.33	0.24	9
20121105_FSC14_VHab2	Deep-sea sand (A6.3)	Bathyal Sand	Bathyal rippled sand with very sparse epifauna		60.116866 -4.7631	60.1234 -4.76495	-481	*calculated for whole tow*		
20121105_FSC15_VHab1	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal mixed substrates dominated by coarse sediments with Porifera; Bathyal mixed substrates dominated by gravel and pebbles with very sparse epifauna		60.152033 -4.6311	60.160133 -4.6236	-436	9.38	1.95	16
20121105_FSC16_VHab1	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal mixed substrates dominated by coarse sediments with Porifera		60.192683 -4.56125	60.200333 -4.5712	-476	7.17	0.86	13

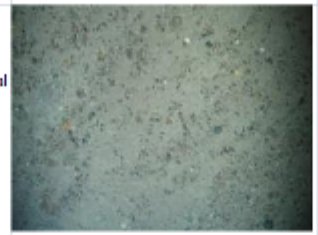
Video Tow (event)	Eunis Habitat: Level 3	Broad Habitat Type	Habitat Names present in individual samples	Typical Image(s)	Position start / point	Position End	Approx. depth (m bsl)	Average taxa richness per 1.6m^2	Standard error	Max Taxa Richness observed in one image
20121103_FSC017_VHab1	Deep-sea sand (A6.3)	Bathyal Sand	Bathyal rippled sand		60.2612 -4.451366	60.26555 -4.46608	-511	4.25	0.49	7
20121105_FSC18_VHab1	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal mixed substrates dominated by gravel and pebbles with very sparse epifauna; Bathyal mixed substrates dominated by sand and gravel with very sparse epifauna; Bathyal muddy substrates with gravel and pebbles and very sparse epifauna;p Mosaic of bathyal coarse sandy gravel and cobble reef with sponge		60.279166 -4.344983	60.283216 -4.3613	-466	7.58	1.35	13
20121105_FSC19_VHab1	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal mixed substrates dominated by sand and gravel with very sparse epifauna		60.38005 -4.166083	60.380466 -4.1747	-469	7.46	0.85	14
20121105_FSC20_VHab1	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal mixed substrates dominated by sand and gravel with sparse epifauna; Bathyal mixed substrates dominated by sand and gravel with very sparse epifauna		60.433183 -4.087816	60.4364 -4.093883	-498	6.95	0.58	13
20121105_FSC_B1_VHab1	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal coarse mixed sediment; Bathyal coarse mixed sediments with sparse cobbles and Porifera; Bathyal sand and pebbles; Bathyal sparse cobble reef on coarse sediments; Mosaic of bathyal coarse sandy gravel and cobble reef with sponge		60.467216 -3.898666	60.473933 -3.9106	-471	8.94	0.83	19

Video Tow (event)	Eunis Habitat: Level 3	Broad Habitat Type	Habitat Names present in individual samples	Typical Image(s)	Position start / point	Position End	Approx. depth (m bsl)	Average taxa richness per 1.6m^2	Standard error	Max Taxa Richness observed in one image
20121105_FSC_B2_VHab	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal coarse mixed sediments with cobbles; Bathyal coarse sediments; Bathyal mixed substrates dominated by sand and gravel with sparse epifauna; Bathyal mixed substrates dominated by sand and gravel with very sparse epifauna; Mosaic of bathyal sand and low quality stony reef with Porifera		60.44275 -3.728783	60.451616 -3.7316	-415	6.13	0.26	11
20121105_FSC_B3_VHab	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal coarse mixed substrates dominated by sand; Bathyal coarse mixed substrates dominated by sand ; Bathyal coarse mixed substrates dominated by sand with rare cobbles; Bathyal coarse mixed substrates dominated by sand with rare cobbles and echinoids; Bathyal coarse sediments dominated by sand and gravels; Bathyal mixed substrates dominated by coarse sediments with cobbles; Bathyal mixed substrates dominated by coarse sediments with echinoderms; Bathyal mixed substrates dominated by coarse sediments with Porifera; Bathyal mixed substrates dominated by coarse sediments with Sparse epifauna; Bathyal mixed substrates dominated by gravel and pebbles with Cnidaria; Bathyal mixed substrates dominated by gravel and pebbles with Porifera; Bathyal mixed substrates dominated by gravel and pebbles with Porifera ; Bathyal mixed substrates dominated by gravel and pebbles with Porifera and Echinoderms; Bathyal mixed substrates dominated by gravel and pebbles with very sparse epifauna; Bathyal mixed substrates dominated by sand and pebbles; Bathyal mixed substrates dominated by sand and pebbles with echinoids; Bathyal mixed substrates dominated by sand with rare cobbles; Bathyal mixed substrates dominated by sand with rare cobbles and echinoids; Bathyal mixed substrates dominated by sand with rare cobbles, echinoids and Porifera.		60.540833 -3.68255	60.548816 -3.6911	-492	6.30	0.36	15
20121105_FSC_B4_V_Hal	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal mixed substrates dominated by coarse sediments with Porifera; Bathyal mixed substrates dominated by coarse sediments with Sparse epifauna; Bathyal coarse mixed sediments with cobbles and Phakellia like sponge aggregations		60.5484 -3.504883	60.556866 -3.4993	-432	8.50	0.40	15

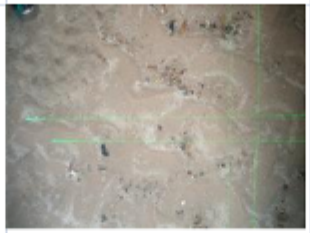
Video Tow (event)	Eunis Habitat: Level 3	Broad Habitat Type	Habitat Names present in individual samples	Typical Image(s)	Position start / point	Position End	Approx. depth (m bsl)	Average taxa richness per 1.6m^2	Standard error	Max Taxa Richness observed in one image
20121106_FSC_B5_VHab	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal mixed substrates dominated by coarse sediments with Porifera; Bathyal mixed substrates dominated by coarse sediments with Sparse epifauna; Bathyal coarse mixed sediments with sparse cobbles and Porifera		60.6209 -3.39485	60.612733 -3.3917	-470	11.17	0.46	19
20121106_FSC_B6_VHab	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal coarse mixed sediments with cobbles and Phakellia like sponge aggregations; Bathyal mixed substrates dominated by coarse sediments with Porifera; Bathyal mixed substrates dominated by coarse sediments with Sparse epifauna; Bathyal mixed substrates dominated by gravel and pebbles with Porifera; Bathyal mixed substrates dominated by gravel and pebbles with Sparse Epifauna		60.6748 -3.35455	60.665566 -3.3528	-500	12.88	1.75	20
20121106_FSC_B7_VHab	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal mixed substrates dominated by coarse sediments with Porifera; Bathyal coarse mixed sediments with cobbles and Phakellia like sponge aggregations		60.881466 -2.84545	60.871516 -2.8443	-495	18.70	1.79	28
20121106_FSC_B8_VHab	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal mixed substrates dominated by coarse sediments with Porifera		60.9484 -2.6934	60.939766 -2.7019	-497	15.61	0.99	22
20121106_FSC_B9_VHab	Deep-sea mud (A6.5)	Bathyal mud with sponge	Bathyal gravelly mud with Porifera; Bathyal muddy gravel with Porifera; Bathyal sandy mud with Porifera		61.1135 -2.220616	61.122666 -2.2271	-547	13.13	0.49	22

Video Tow (event)	Eunis Habitat: Level 3	Broad Habitat Type	Habitat Names present in individual samples	Typical Image(s)	Position start / point	Position End	Approx. depth (m bsl)	Average taxa richness per 1.6m^2	Standard error	Max Taxa Richness observed in one image
20121106_FSC_B10_VHa	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal mixed substrates dominated by coarse sediments with Porifera		61.20565 -1.91215	61.2071 -1.91205	-497	10.55	0.62	16
20121106_FSC_B10_VHa	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal mixed substrates dominated by coarse sediments with Porifera		61.2086 -1.912466	61.21075 -1.91188	-508	*calculated for whole tow*		
2020121107_FSC_B11_VI	Deep-sea mixed substrata (A6.2)	Bathyal Mosaics	Bathyal Low Quality stony reef with Porifera; Bathyal mixed substrates dominated by gravel and pebbles with Porifera; Mosaic of Bathyal mixed substrates and low quality stony reef		61.2628 -1.802383	61.271983 -1.8025	-499	10.16	0.41	20
2020121107_FSC_B12_VI	Deep-sea mixed substrata (A6.2)	Bathyal Mosaics	Bathyal Low Quality stony reef with Porifera; Bathyal Low Quality stony reef with very sparse epifauna; Bathyal mixed substrates dominated by gravel and pebbles with Porifera; Bathyal mixed substrates dominated by gravel and pebbles with very sparse epifauna; Mosaic of Bathyal mixed substrates and low quality stony reef		61.291366 -1.683666	60.30015 -1.68905	-463	7.73	0.48	22

Video Tow (event)	Eunis Habitat: Level 3	Broad Habitat Type	Habitat Names present in individual samples	Typical Image(s)	Position start / point	Position End	Approx. depth (m bsl)	Average taxa richness per 1.6m^2	Standard error	Max Taxa Richness observed in one image
20121102_FSC01_VHab1	Deep-sea mixed substrata (A6.2)	Low Quality Reef	Bathyal Low Quality stony reef with Echinoderms; Bathyal mixed substrates dominated by coarse sediments with Sparse epifauna; Bathyal Low Quality stony reef with Porifera		59.794266 -5.827683	59.789833 -4.8301	-538	4.68	0.39	10
20121102_FSC01_VHab2	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal mixed substrates dominated by coarse sediments with Sparse epifauna; Bathyal mixed substrates dominated by coarse sediments with echinoderms; Bathyal mixed substrates dominated by gravel and pebbles with echinoderms; Bathyal Low Quality stony reef with very sparse epifauna; Bathyal Low Quality stony reef with Echinoderms; Bathyal Low Quality stony reef with Serpulids & encrusting sponge		59.789833 -4.830116	59.7858 -5.8282	-506	*calculated for whole tow*		
20121102_FSC02_VHab1	Deep-sea mixed substrata (A6.2)	Bathyal Mosaics	Bathyal Low Quality stony reef with Echinoderms; Bathyal Potential Annex 1 stony reef with Echinoderms & Porifera; Bathyal mixed substrates dominated by gravel and pebbles with echinoderms; Bathyal mixed substrates dominated by coarse sediments with echinoderms		59.790833 -5.734066	59.782026 -5.7372	-565	7.25	0.45	17
20121102_FSC03_VHab1	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal mixed substrates dominated by coarse sediments with Sparse epifauna; Bathyal mixed substrates dominated by coarse sediments with Porifera; Bathyal Potential Annex 1 stony reef with Porifera; Bathyal Low Quality stony reef with Echinoderms		59.783266 -5.60615	59.790083 -5.5966	-446	5.06	0.45	16

Video Tow (event)	Eunis Habitat: Level 3	Broad Habitat Type	Habitat Names present in individual samples	Typical Image(s)	Position start / point	Position End	Approx. depth (m bsl)	Average taxa richness per 1.6m^2	Standard error	Max Taxa Richness observed in one image
20121103_FSC04_VHab1	Deep-sea mixed substrata (A6.2)	Bathyal Mosaics	Mosaic of Bathyal sand and mixed substrates; Mosaic of Bathyal sand and low quality stony reef; Bathyal mixed substrates dominated by coarse sediments with Sparse epifauna; Bathyal mixed substrates dominated by coarse sediments with Porifera; Bathyal rippled sand		59.836033 -5.551683	59.84325 -5.53995	-498	4.87	0.34	10
20121103_FSC05_VHab1	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal mixed substrates dominated by coarse sediments with Sparse epifauna; Bathyal sand and gravels with cobbles and pebbles		59.8756 -5.481233	59.884 -5.474116	-519	7.00	0.87	15
20121103_FSC06_VHab1	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal mixed substrates dominated by coarse sediments with Sparse epifauna; Bathyal sandy coarse sediment with cobbles and sparse sponge		59.897233 -5.3379	59.905533 -5.3303	-450	7.50	0.63	10
20121103_FSC07_VHab1	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal coarse mixed sediments with sparse cobbles and Porifera; Bathyal mixed substrates dominated by coarse sediments with Sparse epifauna		59.942333 -5.259016	59.951566 -5.2589	-481	7.64	0.47	10
20121103_FSC08_VHab1	Deep-sea sand (A6.3)	Bathyal Mosaics	Bathyal Low Quality stony reef with Serpulids & encrusting sponge; Bathyal mixed substrates dominated by coarse sediments with Sparse epifauna; Bathyal mixed substrates dominated by sand with sparse epifauna; Bathyal rippled sand; Mosaic of Bathyal sand and low quality stony reef		59.976633 -5.164666	59.968366 -5.1782	-496	5.69	0.24	12

Video Tow (event)	Eunis Habitat: Level 3	Broad Habitat Type	Habitat Names present in individual samples	Typical Image(s)	Position start / point	Position End	Approx. depth (m bsl)	Average taxa richness per 1.6m^2	Standard error	Max Taxa Richness observed in one image
20121103_FSC09_VHab1	Deep-sea mixed substrata (A6.2) & Deep Sand (A6.3)	Bathyal Mixed Substrates	Bathyal Low Quality stony reef with Porifera; Bathyal Low Quality stony reef with Serpulids & encrusting sponge; Bathyal mixed substrates dominated by coarse sediments with Porifera; Bathyal mixed substrates dominated by coarse sediments with Sparse epifauna; Bathyal mixed substrates dominated by sand and gravel		59.9618 -5.211816	59.952816 -5.2118	-499	6.09	0.24	14
20121105_FSC10_VHab1	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal mixed substrates dominated by gravel and pebbles with very sparse epifauna; Bathyal mixed substrates dominated by sand and gravel with very sparse epifauna	 	59.9033 -5.387766	59.8941 -5.386133	-509	5.50	0.28	12
20121103_FSC011_VHab1	Deep-sea sand (A5.3)	Bathyal Mixed Substrates	Bathyal mixed substrates dominated by sand with no evidence of epifauna; Bathyal mixed substrates dominated by sand with very sparse epifauna		60.004316 -5.060983	59.9952 -5.0602	-477	3.12	0.21	6
20121105_FSC12_VHab1	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal mixed sediment, sparse epifauna; Bathyal mixed sediment, very sparse epifauna		60.025483 -4.9551	60.020366 -4.9536	-437	4.97	0.61	16

Video Tow (event)	Eunis Habitat: Level 3	Broad Habitat Type	Habitat Names present in individual samples	Typical Image(s)	Position start / point	Position End	Approx. depth (m bsl)	Average taxa richness per 1.6m^2	Standard error	Max Taxa Richness observed in one image
20121103_FSC013_VHab1	Deep-sea sand (A6.3)	Bathyal Sand	Bathyal rippled sand with no fauna; Bathyal rippled sand with very sparse epifauna		60.102883 -4.859083	60.107666 -4.8596	-527	2.66	0.25	7
20121105_FSC14_VHab1	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal mixed substrates dominated by sand with very sparse epifauna		60.117066 -4.763066	60.116866 -4.7631	-481	3.33	0.24	9
20121105_FSC14_VHab2	Deep-sea sand (A6.3)	Bathyal Sand	Bathyal rippled sand with very sparse epifauna		60.116866 -4.7631	60.1234 -4.76495	-481	*calculated for whole tow*		
20121105_FSC15_VHab1	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal mixed substrates dominated by coarse sediments with Porifera; Bathyal mixed substrates dominated by gravel and pebbles with very sparse epifauna		60.152033 -4.6311	60.160133 -4.6236	-436	9.38	1.95	16
20121105_FSC16_VHab1	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal mixed substrates dominated by coarse sediments with Porifera		60.192683 -4.56125	60.200333 -4.5712	-476	7.17	0.86	13

Video Tow (event)	Eunis Habitat: Level 3	Broad Habitat Type	Habitat Names present in individual samples	Typical Image(s)	Position start / point	Position End	Approx. depth (m bsl)	Average taxa richness per 1.6m^2	Standard error	Max Taxa Richness observed in one image
20121103_FSC017_VHab1	Deep-sea sand (A6.3)	Bathyal Sand	Bathyal rippled sand		60.2612 -4.451366	60.26555 -4.46608	-511	4.25	0.49	7
20121105_FSC18_VHab1	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal mixed substrates dominated by gravel and pebbles with very sparse epifauna; Bathyal mixed substrates dominated by sand and gravel with very sparse epifauna; Bathyal muddy substrates with gravel and pebbles and very sparse epifauna;p Mosaic of bathyal coarse sandy gravel and cobble reef with sponge		60.279166 -4.344983	60.283216 -4.3613	-466	7.58	1.35	13
20121105_FSC19_VHab1	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal mixed substrates dominated by sand and gravel with very sparse epifauna		60.38005 -4.166083	60.380466 -4.1747	-469	7.46	0.85	14
20121105_FSC20_VHab1	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal mixed substrates dominated by sand and gravel with sparse epifauna; Bathyal mixed substrates dominated by sand and gravel with very sparse epifauna		60.433183 -4.087816	60.4364 -4.093883	-498	6.95	0.58	13
20121105_FSC_B1_VHab1	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal coarse mixed sediment; Bathyal coarse mixed sediments with sparse cobbles and Porifera; Bathyal sand and pebbles; Bathyal sparse cobble reef on coarse sediments; Mosaic of bathyal coarse sandy gravel and cobble reef with sponge		60.467216 -3.898666	60.473933 -3.9106	-471	8.94	0.83	19

Video Tow (event)	Eunis Habitat: Level 3	Broad Habitat Type	Habitat Names present in individual samples	Typical Image(s)	Position start / point	Position End	Approx. depth (m bsl)	Average taxa richness per 1.6m^2	Standard error	Max Taxa Richness observed in one image
20121105_FSC_B2_VHab	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal coarse mixed sediments with cobbles; Bathyal coarse sediments; Bathyal mixed substrates dominated by sand and gravel with sparse epifauna; Bathyal mixed substrates dominated by sand and gravel with very sparse epifauna; Mosaic of bathyal sand and low quality stony reef with Porifera		60.44275 -3.728783	60.451616 -3.7316	-415	6.13	0.26	11
20121105_FSC_B3_VHab	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal coarse mixed substrates dominated by sand; Bathyal coarse mixed substrates dominated by sand ; Bathyal coarse mixed substrates dominated by sand with rare cobbles; Bathyal coarse mixed substrates dominated by sand with rare cobbles and echinoids; Bathyal coarse sediments dominated by sand and gravels; Bathyal mixed substrates dominated by coarse sediments with cobbles; Bathyal mixed substrates dominated by coarse sediments with echinoderms; Bathyal mixed substrates dominated by coarse sediments with Porifera; Bathyal mixed substrates dominated by coarse sediments with Sparse epifauna; Bathyal mixed substrates dominated by gravel and pebbles with Cnidaria; Bathyal mixed substrates dominated by gravel and pebbles with Porifera; Bathyal mixed substrates dominated by gravel and pebbles with Porifera ; Bathyal mixed substrates dominated by gravel and pebbles with Porifera and Echinoderms; Bathyal mixed substrates dominated by gravel and pebbles with very sparse epifauna; Bathyal mixed substrates dominated by sand and pebbles; Bathyal mixed substrates dominated by sand and pebbles with echinoids; Bathyal mixed substrates dominated by sand with rare cobbles; Bathyal mixed substrates dominated by sand with rare cobbles and echinoids; Bathyal mixed substrates dominated by sand with rare cobbles, echinoids and Porifera.		60.540833 -3.68255	60.548816 -3.6911	-492	6.30	0.36	15
20121105_FSC_B4_V_Hal	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal mixed substrates dominated by coarse sediments with Porifera; Bathyal mixed substrates dominated by coarse sediments with Sparse epifauna; Bathyal coarse mixed sediments with cobbles and Phakellia like sponge aggregations		60.5484 -3.504883	60.556866 -3.4993	-432	8.50	0.40	15

Video Tow (event)	Eunis Habitat: Level 3	Broad Habitat Type	Habitat Names present in individual samples	Typical Image(s)	Position start / point	Position End	Approx. depth (m bsl)	Average taxa richness per 1.6m^2	Standard error	Max Taxa Richness observed in one image
20121106_FSC_B5_VHab	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal mixed substrates dominated by coarse sediments with Porifera; Bathyal mixed substrates dominated by coarse sediments with Sparse epifauna; Bathyal coarse mixed sediments with sparse cobbles and Porifera		60.6209 -3.39485	60.612733 -3.3917	-470	11.17	0.46	19
20121106_FSC_B6_VHab	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal coarse mixed sediments with cobbles and Phakellia like sponge aggregations; Bathyal mixed substrates dominated by coarse sediments with Porifera; Bathyal mixed substrates dominated by coarse sediments with Sparse epifauna; Bathyal mixed substrates dominated by gravel and pebbles with Porifera; Bathyal mixed substrates dominated by gravel and pebbles with Sparse Epifauna		60.6748 -3.35455	60.665566 -3.3528	-500	12.88	1.75	20
20121106_FSC_B7_VHab	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal mixed substrates dominated by coarse sediments with Porifera; Bathyal coarse mixed sediments with cobbles and Phakellia like sponge aggregations		60.881466 -2.84545	60.871516 -2.8443	-495	18.70	1.79	28
20121106_FSC_B8_VHab	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal mixed substrates dominated by coarse sediments with Porifera		60.9484 -2.6934	60.939766 -2.7019	-497	15.61	0.99	22
20121106_FSC_B9_VHab	Deep-sea mud (A6.5)	Bathyal mud with sponge	Bathyal gravelly mud with Porifera; Bathyal muddy gravel with Porifera; Bathyal sandy mud with Porifera		61.1135 -2.220616	61.122666 -2.2271	-547	13.13	0.49	22

Video Tow (event)	Eunis Habitat: Level 3	Broad Habitat Type	Habitat Names present in individual samples	Typical Image(s)	Position start / point	Position End	Approx. depth (m bsl)	Average taxa richness per 1.6m^2	Standard error	Max Taxa Richness observed in one image
20121106_FSC_B10_VHa	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal mixed substrates dominated by coarse sediments with Porifera		61.20565 -1.91215	61.2071 -1.91205	-497	10.55	0.62	16
20121106_FSC_B10_VHa	Deep-sea mixed substrata (A6.2)	Bathyal Mixed Substrates	Bathyal mixed substrates dominated by coarse sediments with Porifera		61.2086 -1.912466	61.21075 -1.91188	-508	*calculated for whole tow*		
2020121107_FSC_B11_VI	Deep-sea mixed substrata (A6.2)	Bathyal Mosaics	Bathyal Low Quality stony reef with Porifera; Bathyal mixed substrates dominated by gravel and pebbles with Porifera; Mosaic of Bathyal mixed substrates and low quality stony reef		61.2628 -1.802383	61.271983 -1.8025	-499	10.16	0.41	20
2020121107_FSC_B12_VI	Deep-sea mixed substrata (A6.2)	Bathyal Mosaics	Bathyal Low Quality stony reef with Porifera; Bathyal Low Quality stony reef with very sparse epifauna; Bathyal mixed substrates dominated by gravel and pebbles with Porifera; Bathyal mixed substrates dominated by gravel and pebbles with very sparse epifauna; Mosaic of Bathyal mixed substrates and low quality stony reef		61.291366 -1.683666	60.30015 -1.68905	-463	7.73	0.48	22

Appendix 5 – Data Archive Appendix.

The following files have been provided to the JNCC on a JNCC external Hardrive as part of the WTR SCI and FSC SMPA Project:

1. REPORTING:

2012 JNCC WTR SAC & FSC SMPA Seabed Imagery Report_FINAL.docx
2012 JNCC WTR SAC & FSC SMPA Seabed Imagery Report_FINAL.pdf

2. DATA FILES:

Marine Recorder:
20130528_JNCC_FSC_NBNdata_MergedOut.mdb
20130528_JNCC_FSC_Snapshot.mdb
20130528_JNCC_WTR_NBNdata_MergedOut.mdb
20130528_JNCC_WTR_Snapshot.mdb
FSC MergeLog_28_05_2013_17_02_21.txt
WTR_MergeLog_28_05_2013_17_03_17.txt

Excel Spreadsheets:
2012 WTR Data from Marine EcoSol in 2013
2012 FSC Data from Marine EcoSol in 2013
2012 FSC_B Data from Marine EcoSol in 2013

3. GIS:
20130530 Final GIS Sent to JNCC.zip
Containing all .bmp of maps contained in this report, and all Stills_Points, Video Midpoints, and Polyline_video in ArcGIS files.

4. IMAGERY:
The JNCC provided Marine EcoSol with all data in the original MiniDV tape format. Marine EcoSol has returned all Mini DVs in addition to:

Digitised original tow imagery:
- all digitised video tows split into habitats
- all stills images associated to tows

Images exported during analysis, split into the following folders:
- good typical images of each tow;
- examples of typical habitat (biotopes);
- trawl marks
- strange features
- litter

MarineEcoSol 2013 Species Catalogue (internal use only)
A collection of species of images and an associated excel catalogue